

CHAPTER 9. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) ENVIRONMENTAL ANALYSIS

Staff from the North Coast Regional Water Quality Control Board (Regional Water Board) developed two proposed amendments to the *Water Quality Control Plan for the North Coast Region* (Basin Plan) that would incorporate the *Klamath River Watershed Temperature, Dissolved Oxygen, Nutrient and Microcystin Total Maximum Daily Loads* (hereinafter draft Klamath TMDLs) and the implementation program into the Basin Plan. The Klamath River implementation plan includes the Implementation Plan for the EPA-promulgated Lost River TMDL in California. In addition, the second proposed amendment would modify Table 3-1 of the Basin Plan by eliminating the existing site-specific dissolved oxygen (DO) water quality objectives (objectives) applicable to the Klamath River mainstem and replacing them with an alternate method of calculating objectives based on percent saturation and natural background temperatures. The proposed amendment would also modify Section 4 of the Basin Plan by adding a new *Klamath River Total Maximum Daily Load Action Plan and Lost River Implementation Plan* (hereinafter proposed Action Plan). These proposed amendments are necessary to comply with existing federal and State laws, regulations, plans and policies. In addition, the development of the Klamath TMDLs is mandated under a court-ordered Consent Decree.

9.1 California Environmental Quality Act Requirements for Exempt-Regulatory Programs

The Regional Water Board is the lead agency for evaluating the environmental impacts of Basin Plan amendments pursuant to the California Environmental Quality Act (CEQA). Although subject to CEQA, the Regional Water Board basin planning process is certified by the Secretary for Resources as “functionally equivalent” to CEQA, and therefore exempt from the requirement for preparation of an environmental impact report or negative declaration and initial study¹. The State Water Resources Control Board (State Water Board) has promulgated guidelines for exempt regulatory programs that describe the documents required for the adoption or approval of standards, rules, regulations or plans². These documents must at least do the following:

1. Provide a brief description of the proposed activity.
In this case, the proposed activity is the adoption of two Basin Plan Amendments: a) Revised DO objective for the Klamath River mainstem and b) “*Action Plan for the Klamath River Watershed Temperature, Dissolved Oxygen, Nutrient and Microcystin Total Maximum Daily Loads*” (proposed Action Plan). The rationale to support the proposed DO objective and Action Plan is fully described in the Staff Report. A brief description is provided in Section 9.2.

¹ Cal. Code Regs., tit. 14, § 15251(g).

² Cal. Code Regs., tit. 23, § 3777.

2. Provide a reasonable discussion of alternatives to the proposed activity. Discussion is provided in Section 9.4.
3. Provide an analysis of mitigation measures needed to minimize any significant adverse environmental impacts of the proposed activity. Discussion is provided in Section 9.5.

Additionally, for actions by the Regional Water Board that adopt a rule or regulation requiring the installation of pollution control equipment, establish a performance standard or establish a treatment requirement, CEQA³ and CEQA Guidelines⁴ require an environmental analysis of the reasonably foreseeable methods by which compliance with that rule or regulation will be achieved. A Substitute Environmental Document (SED) satisfies this requirement if it contains the following components, some of which are repetitive with the list above:

1. An analysis of the environmental impacts from the reasonably foreseeable methods of compliance. The reasonably foreseeable methods of compliance (hereinafter compliance measures) are the potential actions that responsible parties may employ to comply with the TMDL load allocations, numeric targets and the implementation measures in the proposed Action Plan. This analysis is presented in Section 9.5.
2. An analysis of the reasonably foreseeable feasible mitigation measures relating to the identified environmental impacts. This analysis is presented in Section 9.5.
3. An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate any identified impacts. This analysis is presented in Section 9.7.

The environmental analysis must take into account a reasonable range of:⁵

- Environmental factors (see Environmental Setting and Land Use, Section 9.3);
- Technical factors (see Analysis of Compliance Measures, Associated Environmental Impacts, and Potential Mitigation Measures, Section 9.5);
- Population (see Environmental Setting and Land Use, Section 9.3);
- Geographic areas (see Environmental Setting and Land Use, Section 9.3);
- Specific sites (see Analysis of Compliance Measures, Associated Impacts, and Potential Mitigation Measures, Section 9.5); and
- Economic factors (see Economic Considerations, Chapter 10).

While the regulations require consideration of a “reasonable range” of the factors listed above, an examination of every site is not required, only consideration of a reasonably representative sample of them. The statute specifically states that the agency shall not

³ Cal. Pub. Resources Code, § 21159 (a).

⁴ Cal. Code Regs., tit.14 § 15187 (c).

⁵ Cal. Code Regs., tit. 14 § 15187(d); Cal. Pub. Resources Code, § 21159 (c).

conduct a “project level analysis⁶.” Rather, in most circumstances, the project level analysis will be performed by the responsible party to be eligible for enrollment/coverage under the applicable permit (e.g., 401 Water Quality Certification, waste discharge requirements [WDRs], or waiver of WDRs).

Notably, the Regional Water Board is prohibited from specifying the manner of compliance with its regulations⁷, and accordingly, the actual environmental impacts will necessarily depend upon the compliance strategy selected by the responsible party. There could be adverse environmental impacts from specific methods if inappropriate methods are selected or if the management measures selected are not properly implemented. Regional Water Board staff intends that the compliance measures selected by a responsible party be the most cost effective available with the least potential to adversely impact the environment. Responsible parties will develop the suite of compliance measures they will implement to achieve the TMDL load allocations and be compliant with the proposed implementation plan and the revised DO objective. A number of regulatory approaches are (or will be made) available for responsible parties’ use in achieving compliance with the TMDLs. This includes compliance with applicable prohibitions, WDRs or conditional waivers of WDRs.

This Substitute Environmental Document (hereinafter SED) identifies broad mitigation approaches that could be considered for the general categories of land use activity identified in the TMDL pollutant source analysis and implementation plan (Chapters 4 and 6, respectively of this Staff Report). Consistent with CEQA, this document does not engage in speculation or conjecture, but rather considers the reasonably foreseeable environmental impacts of the reasonably foreseeable methods of compliance, and the reasonably foreseeable mitigation measures which would be required to avoid, eliminate, or reduce the identified impacts.

An analysis of the reasonably foreseeable alternative means of compliance is also provided as part of this environmental analysis (see Section 9.7).

9.2 Description of the Proposed Activity

In this case, the proposed activity (or project) is the revision of DO objectives for the Klamath River mainstem; the establishment of the total maximum daily loads (TMDLs) for the temperature, dissolved oxygen, nutrient and microcystin impairments in the Klamath River watershed; and, the adoption of an implementation plan (proposed Action Plan) for the Klamath River watershed necessary to achieve these TMDLs and fully attain water quality standards, including the revised DO objectives. The goal of the proposed implementation plan is to achieve the TMDLs and thereby achieve temperature, dissolved oxygen, nutrient and microcystin-related water quality standards, so as to protect and restore the beneficial uses of water in the Klamath River watershed. The

⁶ Public Resources Code section 21159(d)

⁷ Water Code section 13360

proposed Action Plan sets out the pollutant loads and conditions to be considered and incorporated into regulatory and non-regulatory actions in the Klamath River watershed. The Klamath River Action Plan is not directly and independently enforceable, except as incorporated into permitting or enforcement actions or through the application of waste discharge prohibitions or other permits or orders.

- Regional Water Board staff has developed a proposed site-specific DO objective for the Klamath River in California (Appendix 1 of the TMDL Staff Report) for the Regional Water Board’s consideration to address the inaccuracies in the existing Klamath River DO objectives. The Basin Plan Amendment for DO is an amendment to Table 3-1 in which the existing site-specific DO objectives for the Klamath River mainstem are removed and a method for calculating revised site-specific DO objectives is described, based on percent saturation and natural receiving water temperatures.
- Regional Water Board staff has also developed the proposed Klamath River TMDL Action Plan for the Regional Water Board’s consideration to address the water quality impairment in the Klamath River watershed downstream of the Oregon border. The proposed Basin Plan Amendment, as developed by staff, is an amendment to Section 4 of the Basin Plan to provide an “*Action Plan for the Klamath River Watershed Temperature, Dissolved Oxygen, Nutrient and Microcystin Total Maximum Daily Loads*” (proposed Action Plan).

The proposed Basin Plan Amendment language, including Table 9.1, for the site-specific Klamath River mainstem DO is as follows:

Site-specific dissolved oxygen water quality objectives for the Klamath River are derived by calculating the daily minimum dissolved oxygen necessary to maintain, at a minimum, the percent DO saturation criteria given in Table 9.1 under site salinity, site atmospheric pressure, and natural receiving water temperatures.

Table 9.1: Percent dissolved oxygen saturation based on natural receiving water temperatures

Location	Percent DO Saturation based on natural receiving water temperatures*	Time period
Stateline to upstream of California- Hoopa boundary	90%	October 1 through March 31
	85%	April 1 through September 30
Downstream of Hoopa- California boundary to Turwar	85%	All year
Upper and Middle Estuary	80%	August 1 through August 31
	85%	September 1 through July 31
Lower Estuary	For the protection of estuarine habitat (EST), the dissolved oxygen content of the lower estuary shall not be depressed to levels adversely affecting beneficial uses as a result of controllable water quality factors.	

*These objectives apply throughout the length of the mainstem Klamath River except for where there is Tribal jurisdiction.

The proposed Action Plan consists of a description of the TMDL temperature, dissolved oxygen, nutrient and microcystin-related load allocations and numeric targets and implementation actions necessary to comply with the TMDLs.

The proposed Action Plan includes the following items as part of the implementation program:

- Adoption of a *Prohibition of Discharges in Violation of Water Quality Objectives in the Klamath River Basin*

“Discharges of waste that violate any narrative or numerical water quality objectives that are not authorized by waste discharge requirements or other order or action by the regional or state water board, are prohibited.”

- Adoption of a Thermal Refugia Protection Policy that provides enhanced protection of thermal refugia in and around the mainstem Klamath River and in the Lower Scott River.

The policy would be applicable to all tributary streams in the Klamath River basin that provide known thermal (cold-water) refugia

- Adoption of Guidance to Control Sediment Discharges

The guidance encourages responsible parties to implement specific measures to address sediment source discharges in the Klamath basin.

The SED to support the Regional Water Board’s consideration of the draft Klamath River TMDLs includes:

- The draft Staff Report which provides the technical and environmental analysis necessary to support adoption of the revised site specific DO objective for the Klamath River mainstem and the Klamath River TMDLs;
- The proposed Basin Plan Amendment for the revision of the Klamath River DO objectives; and
- The proposed Action Plan that includes, in part, load allocations and implementation actions necessary to achieve the TMDL and attain water quality standards, including the protection and restoration of beneficial uses of water in the Klamath River watershed.

9.3 Environmental Setting and Land Uses

The Klamath River watershed originates in southeastern Oregon and flows through northern California to the Pacific Ocean in Del Norte County, California. The Klamath River watershed is approximately 12,600 square miles in size, with forty-four percent (44%) of the watershed within the boundaries of Oregon, and the remaining fifty-six percent (56%) located in California.

The human population in the Klamath River basin was estimated in the 2000 US Census to be about 114,000 (United States Census Bureau [USCB] 2000). The largest population concentrations lie in the upper Klamath agricultural area, the Shasta River Valley, and Scott Valley. The largest population center is Klamath Falls in Oregon (19,462 people in 2000) followed by Yreka, California (7,290 people). The Klamath River basin can generally be characterized as a rural watershed with limited population-related water quality issues.

The watershed is composed of large tracts of remote forest and wilderness area, as well as agricultural areas and isolated small-scale urban areas. The watersheds support threatened and endangered species of plants and animals, including runs of anadromous salmon and steelhead trout. The principal reaches of the Klamath River are designated as “wild and scenic” under federal and State law and therefore are protected from development of additional large-scale water use projects.

The current air quality in the region is above average to good. However, Humboldt, Del Norte, and Trinity Counties do not fully meet the state health standards⁸ for clean air. The two pollutants of greatest concern are ozone and particulate matter. The sunny climate, pollution-trapping mountains and valleys, along with the growing population, all contribute to this problem. Particulate matter is fine mineral, metal, soot, smoke and dust particles suspended in the air. The exceedence of state health standards are most often due to catastrophic wildland fires.

The underlying geology in much of the Upper Klamath basin is of volcanic origin. Soils derived from this rock type are naturally high in phosphorus. Through natural erosion and leaching processes, these soils contribute a high background phosphorus load to Upper Klamath basin waters

The geographic source areas in the Klamath River in California can generally be grouped as follows:

- Stateline – Waters entering California from Oregon at Stateline, which includes the Williamson and Sprague River watersheds; Upper Klamath Lake; the Lost River watershed that drains the U.S. Bureau of Reclamation’s Klamath Project (Reclamation’s Klamath Project) area; municipal and industrial point sources to the Klamath River in Oregon; and Klamath River waters passing through Lake Ewauna, the Keno Reach, and JC Boyle Reservoir. Oregon’s Klamath River TMDL source analysis evaluates the contributions from these various sources on the water quality of the Klamath River in Oregon;
- Reservoirs – The reservoirs on the Klamath River within California: Copco 1 and 2 and Iron Gate Reservoirs. Copco Reservoirs 1 and 2 are treated as a single source for the purposes of this TMDL;

⁸ <http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm>

- Iron Gate Hatchery; and
- Tributaries – These include the Lost, Shasta, Scott, Salmon, and Trinity Rivers, and a number of smaller tributary creeks.

The Klamath River has historically been referred to as the “river of renewal”. The Klamath is unusual in that it has its origins in a naturally shallow, eutrophic lake, Upper Klamath Lake, which delivers warm water with high levels of nutrients and organic matter to the Klamath River. Due to an increasing stream gradient and inputs from tributaries with water that is both cooler and generally lower in nutrient content, the Klamath River undergoes a renewal process that leaves it less eutrophic as the river approaches the Pacific Ocean, creating conditions that historically made it one of the most productive cold-water fisheries on the Pacific coast. Despite this unique attribute, current source loads have overwhelmed the historic renewal capabilities of the Klamath, leading to its impaired status. Table 9.2 presents the anthropogenic pollutant source land use categories.

Table 9.2: Anthropogenic pollutant source land use categories⁹

Land Use Source Categories	Temp.	DO	Nutrient	Organic Matter
Wetland conversion		X	X	X
Grazing	X	X	X	X
Irrigated agriculture	X	X	X	X
Timber harvest	X	X	X	X
Roads	X		X	

High ambient air temperatures, coupled with the high levels of biological productivity and respiration that are enhanced by the high levels of biostimulatory nutrients, yield a large mass of organic matter, seasonally high water temperatures, daily low dissolved oxygen, and high pH levels. All of these water quality conditions can be extremely stressful to many forms of aquatic life. These natural background heat, nutrient, and organic matter loads to the Klamath River underscore the very limited capacity of the river to assimilate anthropogenic pollutant sources, and the necessity for establishing load allocations that will result in attainment of water quality standards.

The existing DO objectives for the Klamath River mainstem are based on grab sample data collected in the 1950s and 1960s during daylight hours. They are identified as instantaneous minima. But, because they do not reflect DO conditions during the night time when DO concentrations decrease with the loss of photosynthetic contributions, the existing DO objectives are best applied only during daylight hours. The TMDL analyzes conditions in the Klamath River throughout the day and night and over the course of a year. As such, the model shows that even under natural conditions—in the absence of anthropogenic influences—the Klamath River can not meet the existing DO conditions during the pre-dawn hours of the summer when temperatures are warm and photosynthesis is temporarily arrested. Staff proposes the revision of the DO objectives for the Klamath River to better reflect minima expected across a full 24 hours. The

⁹ From Chapter 4 of this Staff Report

TMDLs are calculated based on the proposed revisions to the Klamath River DO objectives.

The States of Oregon and California are responsible for calculating the TMDL load allocation for each of the pollutants of concern that can be discharged to the watershed and still protect and restore the beneficial uses of the water within their respective jurisdictions.

In the California portion of the Klamath River, increased water temperatures, elevated nutrient levels, low dissolved oxygen concentrations, elevated pH, potential ammonia toxicity, increased incidence of fish disease, an abundance of aquatic plant growth, high chlorophyll-a levels (both planktonic and periphytic algae), and high concentrations of potentially toxic blue-green algae (microcystin), particularly in the impounded reaches (reservoirs), decrease the quality and quantity of suitable habitat for fish and aquatic life, and have disrupted traditional cultural uses of the river by resident Tribes. These conditions contribute to the non-attainment of beneficial uses, including the most sensitive beneficial uses: those associated with the cold water fishery (specifically the salmonid fishery), and those related to cultural uses and practices.

California listed the portions of the Klamath River within its jurisdiction for water quality impairments due to elevated water temperatures, elevated nutrients, and organic enrichment/low dissolved oxygen. The portion of the Klamath River downstream of the Trinity River, within the Yurok Reservation, was also listed for sedimentation/siltation impairment. In March 2008, the USEPA added the reach of the Klamath River that incorporates the Copco 1 and 2 and Iron Gate Reservoirs (located near the California - Oregon Stateline) to the Clean Water Act 303(d) List of Impaired Waterbodies for the blue-green algae toxin microcystin.

The Klamath River numeric and narrative water quality objectives and beneficial uses that are the comparative benchmarks for the TMDL assessment are described in Table 2-1 of the Basin Plan and in the Hoopa Tribal water quality standards,¹⁰ with the exception of the DO objectives for the Klamath River mainstem which are proposed for revision. The Basin Plan, proposed Basin Plan Amendment for DO, and Tribal water quality standards provided the baseline regulatory context for the TMDL assessment and development.

9.4. Analysis of Reasonable Alternatives to the Proposed Activity

Regional Water Board staff has identified four approaches (or alternatives) to address protection and restoration of the beneficial uses of water in the Klamath River watershed. The purpose of this analysis is to determine if there is an alternative that would feasibly attain the basic objective of the rule or regulation, but would lessen, avoid, or eliminate any identified impacts. The first alternative, as required by law, analyzes a “No Action”

¹⁰ Hoopa Tribe Water Quality Control Plan: <http://hoopa-nsn.gov/document/WQCP.pdf>

alternative with no change to the Basin Plan or program implementation. The second alternative also contemplates no change to the Basin Plan but describes an approach that focuses on implementation of existing Regional and State Water Board programs with a phasing in of new regulatory programs for activities not yet covered under a prohibition, conditional waiver or WDRs. The other two alternatives would include amending the Basin Plan, Table 3-1 and Section 4 – Implementation Plans, in some fashion. Alternative three would be based on the USEPA approving the technical aspects of the TMDL prior to the Regional Water Board concluding their deliberative process. This approach would be based on the Regional Water Board adopting an implementation plan based on the federally approved TMDLs. This approach would not include a revised DO objective. The final alternative, and staff’s recommended approach, would be to:

- Revise the Basin Plan (Table 3-1) to include the proposed revision to the site-specific DO objectives for the Klamath River mainstem,
- Amend the Basin Plan Section 4 to include the proposed Action Plan.

The staff report for the “*Proposed Site-Specific Dissolved Oxygen Objective for the Klamath River in California*” is included as Appendix 1 of this Staff Report.

The alternatives are compared on the basis of their ability to protect water quality and beneficial uses (i.e., their likelihood of success), and whether the approach is feasible, flexible and equitable.

9.4.1 No Action - No Change in Basin Plan Language or in Program Implementation

Under the “No Action” alternative, no amendment to the Basin Plan would occur and staff would continue to implement existing Regional and State Water Board programs as in the past. Under this alternative, USEPA, as required under the court-ordered Consent Decree, would approve a TMDL by December 2010. Since USEPA has the authority to approve the technical, science-based portions of the TMDL (e. g., the source analysis and load allocations) but not the implementation program, this alternative would not increase the likelihood of water quality protection nor lead to the restoration of the impaired beneficial uses of water. Nor would it correct the inaccuracies in the existing DO objectives for the Klamath River mainstem. It would also be limited to implementation actions from responsible parties engaged in land use activities that are currently covered by a State or Regional Water Board permit.

Under this alternative, discharges of waste and impacts to water quality will likely continue as no comprehensive program would be put in place that describes the implementation actions necessary to achieve compliance with water quality standards. This is true for a number of reasons. First, there are a number of land use activities identified in the source assessment and implementation plan that have the potential to discharge non-point sources of waste that are not covered by a regulatory program. The No Action approach would allow some dischargers to continue to engage in activities that discharge waste without any control, while other landowners must comply with permits already in place (i.e. timber is already regulated under WDRs and waivers while grazing and irrigated agriculture are not currently). This is not equitable. Moreover, state law

requires that unregulated discharge eventually be covered by some permitting mechanism. Allowing some discharges of waste to continue indefinitely is not legally feasible, and will not likely result in the attainment of water quality standards. Second, federal and state implementation grants and other funding sources are typically only available for projects located in watersheds that have an approved TMDL Action Plan or some other effective watershed-scale management plan in place.

Pros:

- Allows re-direction of Basin Planning staff to begin/continue work on the next issue on Triennial Review Priority List.
- Allows TMDL Development staff to begin/continue work on the development of the next TMDL on Impaired Waters List.

Cons:

- No comprehensive watershed program would be put in place.
- Inaccurate DO objectives for the Klamath River mainstem would remain in place.
- Restoration of the suite of beneficial uses of water impaired by controllable water quality factors would be unlikely.
- This alternative would likely result in legal challenge and substantial diversion of Regional Water Board resources.

9.4.2 No Basin Plan Amendment and Increased Staff Focus on Implementation (and Development) of State and Regional Regulatory Programs

As with the “No Action” alternative, this approach would not result in any revision to the Basin Plan and would necessitate USEPA’s approval of the TMDLs. This approach is based on using existing State and Regional regulatory programs and permits as the implementation program for the protection and restoration of beneficial uses of water in the Klamath River watershed. This approach would necessitate the re-direction of staff from other programs or geographic areas, to allow for the increased focus necessary to fully engage in the permitting, inspections and enforcement actions (as appropriate) that would be required to fully staff this approach. This approach could include increased staff focus on the statewide Caltrans stormwater NPDES permit, general statewide construction stormwater permit, U.S Forest Service timber waiver, General WDRs – conditional waiver for timber activities on private lands, and 401 water quality certification program. New regulatory programs (i.e. prohibitions, waivers or WDRs) for activities not currently regulated would be developed as staff resources allowed.

Pros:

- As with Alternative 1, would save basin planning resources and allow planning staff to start addressing the next issue on Triennial Review Priority List.
- As with Alternative 1, would save TMDL resources and allow TMDL Development staff to begin/continue development of the next watershed on Impaired Waters List.
- Would allow staff to engage more actively in existing regulatory programs at the watershed scale.

- Would help watershed enforcement priorities due to staff familiarity with the watershed.
- Could result in significant revenue for the State's Cleanup and Abatement Account, through assessment of fines in conjunction with enforcement actions.

Cons:

- Would not address nonpoint sources of discharge from a number of sources identified in the TMDL pollutant source analysis and implementation plan (e.g. grazing, road building, alteration of riparian habitat or impacts to thermal refugia) in the near term.
- Would not correct inaccurate DO objectives for the Klamath River mainstem.
- Would require re-direction of staff from other priority work (e.g. landfills, cleanups, stormwater, etc.).

9.4.3 Adopt Basin Plan Amendments Based on the Federally Approved Klamath River TMDL and Proposed Regionwide DO Objective Revision

This alternative would be predicated on the USEPA approving the Klamath River TMDLs before the Regional Water Board had concluded its deliberative process and adopted its TMDL and DO objective revision. The time frame for final approval of the TMDLs is driven by a court-order Consent Decree. As such USEPA will be required to approve the TMDLs by the end of December 2010, regardless of whether the Regional Water Board has taken formal action or not. Since Regional Water Board and USEPA staff have been working jointly over the preceding six (6) years to develop this draft Klamath River TMDL report, it is likely that USEPA would approve some version of the TMDLs developed by the Regional Water Board. In the event USEPA approves the TMDL, the Regional Water Board could still elect to amend the Basin Plan by: 1) incorporating the federally approved TMDLs and an implementing program as described in Chapter 6 of the Staff Report, or 2) incorporating only the Klamath River implementation plan (as an Action Plan) into the Basin Plan.

Also, Regional Water Board staff intends to propose a regionwide revision to the DO objectives contained in Table 3-1 of the Basin Plan, based on the same rationale for their revision in the Klamath River mainstem. The Regional Water Board could elect to postpone adoption of a Basin Plan Amendment to revise the DO objectives for the Klamath River and wait to adopt a revision to all the DO objectives contained of Table 3-1 of the Basin Plan in concert with USEPA's approval of the technical TMDL.

Pros:

- Would save TMDL Unit staff time and resources, allowing them to focus on next highest priority TMDL.
- Would save Basin Planning staff time and resources by reducing the number of Basin Plan Amendments necessary for processing.
- Deflects threat of litigation and legal challenge on the technical aspects of the TMDLs to USEPA.

Cons:

- Defers establishment of the technical-basis of the TMDL (e.g., load allocations and numeric targets) to the USEPA.
- Postpones correction of the DO objectives for the Klamath River.
- NPDES permits, WDRs, and waivers issued by the Regional Water Board will need to be compliant with federal load allocations.
- Does not honor commitments made to USEPA and the Consent Decree plaintiffs to develop the Klamath River TMDL in a timely fashion.
- Will still require significant Basin Planning Unit staff resources to develop an Action Plan based on the federal TMDL.

9.4.4 Adopt Basin Plan Amendment Based on the Klamath River TMDL developed by Regional Water Board staff (Recommended Alternative)

Staff recommends amending Table 3-1 of the Basin Plan to revise the DO objectives for the Klamath River mainstem and amending Section 4- Implementation Plans of the Basin Plan to include an “*Action Plan for the Klamath River Watershed Temperature, Dissolved Oxygen, Nutrient and Microcystin Total Maximum Daily Loads*”. Table 3-1 of the Basin Plan would be amended to eliminate the existing DO objectives for the Klamath River mainstem and replace them with a method for calculating alternate site-specific DO objectives based on percent saturation and natural receiving water temperatures. The Action Plan would include the source assessments for each of the listed impairments, load allocations for each of the identified sources and an implementation program describing the actions likely necessary to achieve the TMDL load allocations and numeric targets. The proposed Action Plan (see Basin Plan language link) can be found at:

http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/.

The technical support for the proposed Action Plan can be found, in part, in Chapters 1-6 of this Staff Report. The Staff Report is also available at the above referenced Regional Water Board webpage.

Pros:

- Maintains Regional Water Board authority in establishing load allocations, numeric targets, and water quality standards for the Klamath River watershed, in lieu of the establishment of federal load allocations.
- Ensures swift correction of inaccurate DO objectives for the Klamath River to aid in the compliance of the TMDLs with water quality objectives.
- Allows Regional Water Board staff to develop a proposed Action Plan for the Board’s consideration based on the information developed by their staff.
- Takes full advantage of the opportunity provided to interested stakeholders, other agencies, and the regulated community, and the input received from these outreach efforts, in the development of the staff-sponsored TMDLs and proposed Action Plan.

Cons:

- Will require extensive Regional Water Board staff resources to develop, bring to the Regional Water Board for their consideration, and prepare the administrative record for the State Water Board's consideration.
- Focuses threat of litigation onto Regional Water Board.

9.5 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures

Analysis of the potential environmental impacts resulting from basin planning projects is required by State law and policy (see Section 9.1). This analysis of potential environmental impacts was conducted by considering the numerous alternative methods available to comply with the revised DO objectives and TMDLs. The Regional Water Board is prohibited by law from specifying the means by which responsible parties will comply with water quality requirements, including water quality objectives and TMDL implementation. As such, potential environmental impacts associated with compliance with the revised DO objectives and TMDLs depend, in large part, upon the specific compliance methods selected by the responsible parties, some of whom will be public agencies subject to their own CEQA obligations. (See Pub. Res. Code, § 21159.2). Environmental impacts associated with individual projects that occur on federal land (approximately 66% of the watershed) will be further evaluated under the federal National Environmental Policy Act (NEPA) process.

Because the TMDLs are calculated based on the proposed revisions to the DO objectives for the Klamath River mainstem, the methods chosen to comply with the load allocations identified in the TMDLs will be the same as those appropriate to comply with the revised DO objectives. To assess the potential environmental impacts associated with the various methods of complying with the TMDLs and DO objectives, this environmental analysis first identifies the reasonably foreseeable means (compliance measures) by which a responsible party could achieve compliance. Compliance measures are those actions that will likely be needed, beyond those required under other regulatory programs, to ensure compliance with the TMDLs and revised DO objectives. Second, the environmental effects associated with implementation of the compliance measures are identified. If a potential adverse environmental impact was identified, an analysis was then conducted to determine if feasible mitigation measures could be applied that would lessen the significance of the identified impact. Consistent with Public Resources Code section 21159, this SED does not engage in speculation or conjecture, but rather considers the reasonably foreseeable environmental impacts of the foreseeable methods of compliance. This analysis also considers reasonably foreseeable alternative means of compliance that could avoid or reduce the identified impacts (see Section 9.7).

Specific compliance measures (including best management practices or BMPs and other pollution controls) that likely will be used to comply with requirements of the TMDLs and revised DO objectives will depend on a number of conditions such as the impairment category being addressed (e.g., temperature, dissolved oxygen, nutrients or microcystin),

source category (e.g., land use activity such as road and crossing construction, reservoir management, or irrigated agriculture) and environmental setting (such as forestland, grazing lands, or impounded river reaches). A combination of structural (e.g., engineered) and non-structural (e.g., operation and maintenance) compliance measures will likely be used by responsible parties. In response to numerous public comments objecting to additional interim land use requirements for nonpoint source discharges that overlapped with already existing or proposed future basin or region-wide programs, staff has eliminated the proposed interim waiver requirements and Sediment Prohibition to allow time to develop basin or region-wide programs that will address these discharges in a sensible and systematic way. Management measures likely to be included as part of those future programs are analyzed broadly in this document. Landowners may choose to implement measures voluntarily and are encouraged to follow the Sediment Guidance previously articulated in the Sediment Prohibition. Future programs implemented by waste discharge requirements, waivers or certifications will be accompanied by additional CEQA analyses as appropriate.

The measures that could be used to comply with the proposed implementation plan and DO objectives, and the potential environmental impacts associated with their implementation are discussed below. The categories of resources that the Regional Water Board has identified as potentially being impacted by the implementation of the BMPs includes:¹¹

- Aesthetics;
- Air quality;
- Biological resources;
- Cultural resources;
- Geology and soils; and
- Hydrology and water quality.

In most cases, any potential impacts would be temporary and the result of installing, maintaining and/or removing structural BMPs. Most of the structural BMPs identified as reasonably foreseeable methods of compliance with the proposed implementation plan would cause very minimal, if any, adverse impacts. Only those BMPs that involve installation of structural features that result in land disturbance or alteration would potentially have the ability to cause adverse environmental impacts. These impacts include such things as air quality impacts from the use of heavy equipment for road construction projects and, impacts to biological resources from disturbance to habitat by heavy equipment, or the installation of fencing for riparian protection or grazing management, and impacts to cultural resources from heavy equipment use. However, it is staffs' judgment that all of these potential impacts can be mitigated to levels expected to be less than significant. Staff has added a programmatic analysis of dam decommissioning in response to public comments on the first circulated draft. Several impacts related to dam decommissioning activities are identified in addition to those

¹¹ See CEQA Checklist (Section 9.7.2)

already previously identified, including aesthetics impacts, air quality impacts from blasting and heavy equipment use, and biological and water quality impacts from release of turbid water from dam decommissioning activities. As the decision on whether to decommission the dams has not been made and, therefore, the exact nature of the decommissioning activities has not yet been developed, Regional Water Board staff has based the analysis of potential environmental effects of dam decommissioning on the readily available decommissioning studies conducted in the Klamath River watershed. Staff has determined that potentially significant impacts may occur to biological resources and water quality, and it is unclear without further study whether the potentially significant adverse environmental effects can be fully mitigated to levels of insignificance.

The following examples are not meant to be exhaustive of the suitable suite of compliance measures but rather provide a representative sample with the widest range bracket to accommodate as many compliance scenarios as possible.

This analysis is organized to correspond with the format presented in Chapter 6 – Implementation Plan of the draft Staff Report which lays out implementation actions based on source areas receiving allocations and targets. As described above, the load allocations are calculated based on the proposed revision to the DO objectives for the Klamath River. As such, reasonably foreseeable compliance measures to achieve compliance with the load allocations will necessarily achieve compliance with the proposed revised DO objectives, as well. This format presents the environmental analysis for likely implementation actions from sources associated with the following:

- Stateline (Staff Report Section 6.2)
- Klamath Hydroelectric Project and Iron Gate Hatchery (Staff Report Section 6.3)
- Klamath River tributaries (Staff Report Section 6.4)
 - Lost River
 - Shasta River
 - Scott River
 - Trinity River
- Watershed-wide (Staff Report Section 6.5)
 - Road construction and maintenance
 - Grazing
 - Irrigation agricultural
 - Timber harvest
 - Measure to protect thermal refugia

An analysis is included on the environmental effects from fire management activities on federal lands as the proposed implementation plan recommends actions relative to post-fire treatment in control discharge of nutrients and excess sediment.

9.5.1 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures Associated with Actions to Achieve Load Allocations and DO Objectives at Stateline

The Oregon-California stateline (Stateline) is the point at which the Klamath River crosses the Oregon-California border. Stateline is designated as a compliance point in the draft Klamath TMDLs. The pollutant loads in the Klamath River entering California are the result of loadings in Oregon, including the Lost River basin, which is partially in California. Oregon has listed the Klamath River in Oregon on its CWA section 303(d) list as failing to meet Oregon water quality criteria. The Oregon-issued TMDLs will be based on Oregon's water quality standards. Because these TMDLs (and their anticipated load and wasteload allocations) are being developed by Oregon as part of a comprehensive multistate analysis of pollutant loadings to the Klamath River, they are also being designed to meet California water quality standards, including the proposed revised DO objectives, at Stateline. Improvements in water quality in Oregon represent a critical part of the solution in meeting water quality objectives in California.

Oregon is responsible for developing an implementation plan to meet the Klamath and Lost River TMDLs in Oregon. The implementation plan will include the following elements:

- Identification of management measures to meet load allocations;
- A timeline for implementation with measureable milestones;
- A timeline for attainment of water quality standards, including the proposed revised DO objectives;
- A monitoring plan; and
- General discussion of costs and funding for implementation.

The Regional Water Board intends to work closely with Oregon in implementing the Klamath and Lost River TMDLs. One of the purposes of coordination with Oregon is to align each States' approach to controlling nonpoint sources of pollution.

9.5.1.1 Analysis of Compliance Measures Associated with Actions to Achieve Load Allocations and Proposed Revised DO Objectives at Stateline

- Implementation of the Klamath TMDLs will be coordinated with the Regional Water Board, Oregon Department of Environmental Quality and the USEPA. A Memorandum of Agreement (MOA) has been established that provides a framework for joint implementation of the Klamath River and Lost River TMDLs. The MOA includes commitments such as:
 - Work to develop and implement a joint adaptive management program.
 - Work with appropriate entities to develop and implement basin wide monitoring programs.
 - Work jointly with responsible parties to develop effective implementation plans to achieve water quality standards, including the proposed revised DO objectives.

- Explore centralized treatment options such as treatment wetlands, algae harvesting, and package wastewater treatment systems to reduce nutrient loads to the Klamath River.
- Work to develop and implement a basin wide water quality tracking and accounting program that would establish a framework to track water quality improvements, facilitate planning and coordinated TMDL implementation, and enable appropriate water quality offsets or trades.

9.5.1.2 Potential Environmental Impacts Associated with Actions to Achieve Load Allocations and Proposed Revised DO Objectives at Stateline

- None identified. It is staffs' judgment that the development of a coordinated program to develop comprehensive basin wide implementations actions will not result in potential environmental impacts. The MOA contemplates the exploration, development and implementation of centralized treatment options which may yield projects that could result in environmental impacts; however, this program is still in the early stage of development and any environmental analyses would be highly speculative and not useful at this time. If a given project is identified in the future that may have associated environmental impacts, the Regional Water Board will conduct a CEQA analysis in accordance with California Code of Regulations, title 14, section 15277 [projects located outside California]. To the extent that some future projects are similar or overlap with those discussed in the context of the Klamath Hydroelectric Project, those impacts are addressed below.

9.5.1.3 Possible Mitigation Measures to Avoid Impacts Associated with Actions to Achieve Load Allocations and Proposed Revised DO Objectives at Stateline

- Not applicable.

9.5.2 Analysis of Compliance Measures, Associated Potential Environmental Impacts, and Possible Mitigation Measures for Klamath Hydroelectric Project

The Klamath Hydroelectric Project (KHP) is a federally licensed project owned and operated by PacifiCorp and consists of eight facilities in California and Oregon. The implementation plan addresses the impacts of the project facilities in California, which include the Copco 1, Copco 2, and Iron Gate dams/reservoirs. As described in the Klamath TMDL Staff Report, the presence of dams impacts water quality by increasing stream temperatures and increasing the bioavailability of sediment-sorbed nutrients. They also serve to alter the natural pattern and range of river flows.

The Klamath River TMDLs assign load allocations and targets at levels necessary to achieve water quality standards within the KHP area, including the proposed revised DO objectives. Regulation and enforcement of the TMDL allocations is traditionally through the State Water Board water quality certification process that accompanies renewal of a license issued by the Federal Energy Regulatory Commission (FERC). As described in more detail below, certain parties have been engaged in settlement negotiations that contemplate the voluntary removal of the KHP. Because the regulatory process and outcome of the settlement negotiations is largely outside of the Regional Water Board's

control, the Klamath River TMDL implementation plan is developed to accommodate various alternatives.

To comply with the TMDL, PacifiCorp must implement management measures that result in attainment of the load allocations and targets from the KHP facilities in California, including the proposed revised DO objectives, regardless of whether the dams remain or are ultimately decommissioned. Regulation and enforcement of these TMDL allocations is traditionally through the SWRCB Clean Water Act section 401 water quality certification process, since the Regional Water Board is preempted from issuing a permit to the KHP. The KHP operates under a FERC license that expired on March 1, 2006. The KHP will continue to operate under an annual license until the license is renewed or a decision to decommission the dams is made. Renewal of the license requires compliance with the CEQA and the issuance of a Clean Water Act section 401 water quality certification by the SWRCB. In issuing water quality certification, the state may impose conditions on the KHP in order to certify that the project protects beneficial uses and meets water quality objectives as specified in the Basin Plan. The Klamath TMDLs and proposed revised DO objectives, upon adoption, will become part of the Basin Plan and will thus become part of the comprehensive plan that FERC must consider as part of its licensing decision. In 2004, FERC prepared a Final Environmental Impact Statement (FEIS) that describes the positive and negative environmental effects of the proposed action to relicense the continued operation of the KHP, and alternative actions, including decommissioning all or part of the project. As authorized by section 401, the SWRCB will apply appropriate state water quality requirements through the FERC licensing proceeding as part of its decision to issue or deny water quality certification. SWRCB staff is preparing an Environmental Impact Report (EIR) that relies in part on the FEIS. The EIR will evaluate four alternatives for operating the KHP, two of which include removal of two and four of the KHP dams, respectively.

At the same time, certain parties have been engaged in settlement negotiations that contemplate the voluntary removal of the KHP. These negotiations and subsequent agreements stemmed from a larger negotiation of the Klamath Basin Restoration Agreement (KBRA) that addresses water rights issues in Oregon. Completion of the KBRA was contingent on completion of the Klamath Hydroelectric Settlement Agreement (KHSA). On November 13, 2008, an Agreement in Principle (AIP) to remove four of the Klamath River dams (JC Boyle, Copco 1 and 2, and Iron Gate) was announced after negotiations between the representatives of the federal government, the state of California,¹² the state of Oregon, and PacifiCorp. On September 30, 2009 a draft Klamath Hydroelectric Settlement Agreement (KHSA) was released. (Documents are available at <http://www.edsheets.com/Klamathdocs.html>.)

¹² State of California is defined as the State of California Resources Agency and its constituent departments and excludes all other state agencies, departments, boards and commissions. The Regional Water Board is not a constituent department under the Resources Agency.

Under section 3.3 of the draft KHSA, the Secretary of the Department of the Interior will conduct very detailed studies and assessments to determine, *inter alia*, whether dam removal (i) will advance restoration of the salmonid fisheries of the Klamath Basin, and (ii) is in the public interest. The Secretary is to make a determination by March, 2012, subject to various contingencies, on whether to move forward with the project. As part of this process, a detailed plan for facility removal will be developed that describes the “physical methods to be undertaken to effect Facilities Removal, including but not limited to a timetable for Decommissioning and Facilities Removal, which is removal of all or part of each Facility as necessary to effect a free-flow condition and volitional fish passage.” (KHSA, § 3.3.2.)

In the absence of the FERC/401 process, the TMDL load allocations (and existing water quality objectives) as they apply to the KHP cannot be directly implemented and enforced. Settlement Parties address TMDL implementation in Oregon and California in section 6.3 of the draft KHSA. Section 6.3.2 of the KHSA describes generally the content of PacifiCorp’s implementation plan to include a timeline for implementing management strategies, water quality-related measures in Appendix D and Facilities Removal as the final measure. The proposed plan may further include other planned activities and management strategies developed individually or cooperatively with other sources or designated management agencies. Appendix D contains water-quality measures that could potentially serve to meet TMDL needs in the interim while additional studies are conducted. The interim measures identified in Appendix D of the draft KHSA are taken by Regional Board staff as the compliance measures on which PacifiCorp will base the implementation program designed to meet their TMDL waste load allocations until a decision is made on which regulatory path PacifiCorp will proceed, and if dams are decommissioned, until the dams are finally removed. If the decision is ultimately made not to remove the dams, the interim measures are not presumed to provide final compliance with the TMDL load allocations, and the FERC/401 process resumes.

The Regional Water Board can only determine whether the selected outcome will meet its TMDL needs. The implementation plan provides for Regional Water Board review of more site specific environmental assessments of dam removal. Both dam alteration/modifications and dam removal are recognized as possible strategies by which final compliance with the TMDL load allocations may be accomplished. Whether the dams are ultimately removed is a decision before several federal and state agencies in consideration of other factors in addition to water quality, including water allocations, species protection and power needs. These decisions will necessarily be informed by detailed environmental review.

In the previous draft Klamath TMDL, staff had not attempted to analyze dam removal impacts or permanent infrastructure modifications because the action was indeterminate and would certainly require CEQA compliance before proceeding. In its comments on the draft Klamath TMDL, PacifiCorp submitted that dam removal was a foreseeable means of compliance with the TMDL and requested that it be included in the

environmental documentation. PacifiCorp listed a series of studies that have been conducted to date on dam removal that could be appropriately relied upon for a programmatic assessment. Accordingly, the following programmatic environmental analysis will evaluate the potential environmental impacts of dams removal and proposed modifications if dams are not removed in addition to the previous analyses of interim measures (note that reference to Exhibit 1C of the AIP is replaced by Appendix D of the draft KHSA, which are the same in substance). The environmental effects of dam removal are not intended to be site-specific. A detailed environmental analysis of impacts and subsequent Regional Water Board approval is required before this activity may occur.

What follows is an environmental analysis of the potential adverse environmental impacts arising from implementation of two distinct implementation strategies related to attaining TMDL load allocations and meeting water quality standards at the KHP.

The first part of the analysis is an evaluation of the environmental effects associated with interim compliance measures that PacifiCorp has identified as actions that might reasonably be taken to move the existing KHP dams toward compliance with the TMDL load allocations and applicable water quality standards. Section 9.5.2.1 through 9.5.2.10 of this Staff Report presents the analysis of the potential environmental impacts associated with implementation of ten (10) measures identified in Exhibit 1C of the AIP that Regional Water Board staff identified as being viable now or in the near future or measures that will require additional study before implementation is possible. These measures, identified by PacifiCorp as being reasonable compliance measures, are discussed below. Staff has determined that these measures represent reasonable interim measures that could be used to improve water quality and beneficial uses until a final decision is made on the KHP. Exhibit 1C of the AIP is included in this Staff Report by reference.

The second part of this assessment analyzes the environmental effects of the decommissioning or removal of one or more of the three KHP dams located in California. Section 9.5.2.11 contains an environmental analysis of the effects of a dam(s) removal scenario. Several dam decommissioning studies have been conducted over the past few years, many of them focused on removal of dams on the Klamath River system. These studies evaluated various scenarios for dam removal, physical methods of dam decommissioning, identification of reasonable compliance measures to mitigate for effects associated with dam removal and an estimate of costs associated with different aspects of dam removal and decommissioning. The list of studies Regional Water Board staff relied on in preparation of the programmatic environmental analysis for a dam removal scenario is presented below in section 9.5.2.11, and incorporated herein by reference. These studies are available for review online (see page 9-34 of this Staff Report) and at the Regional Water Board office.

This analysis does not include consideration of any of the measures to be taken in Oregon.

9.5.2.1 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Constructed Wetlands Treatment

The feasibility of constructed treatment wetlands has been considered as a potential action for use PacifiCorp in the Klamath Hydroelectric Project. Three different types of constructed treatment wetlands were considered. They include:

- Upstream “preventative” wetlands;
- In-reservoir treatment through vegetative swales; and
- In-reservoir floating wetlands.

Analysis of Compliance Measures Associated with Constructed Wetlands Treatment

- The upstream “preventative” treatment wetlands would be constructed on sites upstream of the Copco Reservoir and downstream of Upper Klamath Lake. Surface flow would be routed through the treatment wetlands in multiple cells and with multiple parallel flow paths using existing and new river diversions for irrigation and existing irrigation canals. Pumping from the river would be a last resort. If necessary, alum or aluminum polymers could be added to enhance phosphorus and particulate removal. Mulch gabions could also be distributed throughout the wetlands to deliver a steady flow of carbon to enhance microbial denitrification.
- The in-reservoir approach consists of the potential removal of cyanobacteria biomatter from reservoir coves into adjacent subsurface flow or infiltration-based vegetated swales. Algae would be removed by surface skimming and then pumped into adjacent gravel-filled gabions planted with native grasses (bioswale).
- The floating treatment wetlands would be built directly in the reservoirs. The complex aquatic root systems serve to filter out particulate matter, take up nutrients, and provide habitat and shelter for zooplankton and fish that consume algae. Floating treatment wetlands also can provide shade that helps to reduce algae development.

Potential Environmental Impacts Associated with Constructed Wetlands Treatment

- Temporary construction-related discharges of sediment.
- Temporary air quality impacts from heavy equipment use.
- Impacts to archaeological and cultural resources.
- Temporary impacts to plant and animal species, including disturbance to habitat.
- Temporary impacts to water quality from construction-related increases in turbidity.
- Impacts to water quality from the release of soil-sequestered nutrients once land is flooded to create wetlands.

Possible Mitigation Measures to Avoid Impacts Associated with Constructed Wetlands Treatment

- Restrict work to days in which soil detachment by wind or water is not expected.

- Time the completion of work to coincide with planting to reduce the length of time in which bare soil is exposed.
- Cover exposed soil that will not receive immediate planting with straw or other suitable erosion control material.
- Protect drainage channels from sediment contributions with vegetated buffers, wattles, or similar erosion control devices.
- Time heavy equipment use to occur during period of good air quality.
- Conduct a project-level CEQA analysis to identify archaeological and cultural resources requiring protection.
- Conduct a project-level CEQA analysis to identify biological resources, including threatened and endangered species and their habitat, requiring protection.
- A turbidity curtain can be used to contain turbidity effects within an acceptable minimum location during construction activities.
- Amend constructed wetland soil with alum, calcium carbonate (calcite), or calcium-magnesium carbonate (dolomite) to bind labile phosphorus and prevent it from entering the water column.

9.5.2.2 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Mechanical Removal of Algae Biomatter

PacifiCorp is evaluating the efficacy of mechanical removal of algae biomatter from Copco and Iron Gate reservoirs as a technique for improving water quality conditions in localized places such as near picnic sites or boat launches. According to PacifiCorp (2009), they have not yet identified specific harvesting techniques. Nor have they evaluated the alternatives for disposal, except the use of bioswales.

The mechanical removal of algae biomatter is described in wastewater treatment literature, as well as literature associated with the production of algae as a food source. Harvesting techniques may include three steps: 1) methods for concentrating algae into a harvestable mat, 2) removal of algae mats from the water column, and 3) disposing of waste.

Analysis of Compliance Measures Associated with Mechanical Removal of Algae Biomatter

- Concentrate algae into harvestable mats using:
 - Air bubbles
 - pH adjustment
 - Coagulants (e.g., alum or ferric chloride)
- Removal of algae mats can be accomplished by using:
 - Suction equipment
 - Mechanical harvesting equipment.
- Disposal of waste is accomplished by:
 - Dewatering
 - Landfill disposal
 - Use as a soil amendment.

Potential Environmental Impacts Associated with Mechanical Removal of Algae Biomatter

- Temporary effects of elevated turbidity resulting from compressed air, coagulants, suctioning, and/or mechanical harvest.
- Effects of pH adjustment, alum or ferric chloride on aquatic species.
- Disturbance of habitat important to threatened or endangered species, or other sensitive species or species of special concern.
- Temporary effects of elevated odors associated with algae disposal in bioswales, dewatering sites, and/or land application as fertilizer.
- Effects on native species associated with the potential increase in pest species drawn to decomposing algae.
- Increase in microcystin toxic concentration in the column from disturbance of algal cells.
- Increase in waste loads to the local solid waste handling facility.

Possible Mitigation Measures to Avoid Impacts Associated with Mechanical Removal of Algae Biomatter

- A turbidity curtain can be used to contain turbidity effects within an acceptable minimum location during construction activities.
- Only use pH adjustment, alum or ferric chloride in locations and during times when harmful effects on aquatic species can be avoided.
- Only harvest algae from locations where threatened and endangered species habitat will not be disturbed. Alternatively, apply to the appropriate wildlife agency for an incidental take permit.
- Choose locations for algae dewatering that are suitably downwind of any population center.
- Actively compost algae to ensure a reduction in odors and development of a product suitable for land application and/or to prevent overwhelming local solid waste facilities.
- Stop work if bioswales, dewatering sites, or compost piles are attracting pest species that harm native species.
- Stop work if harvesting of algae results in an increase in the microcystin toxin concentration.

9.5.2.3 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Conventional Wastewater Treatment

Conventional wastewater treatment involves primary treatment (e.g., screening, grit removal, and primary sedimentation), secondary treatment (e.g., attached growth process or suspended growth process of biological treatment), advanced treatment (e.g., nitrification/denitrification, coagulation-sedimentation, carbon adsorption), and disinfection (e.g., chlorination/dechlorination, ozone), as appropriate.

Analysis of Compliance Measures Associated with Conventional Wastewater Treatment

- The installation of a wastewater treatment system is a major construction project, involving all the environmental risks common to large-scale construction. If chosen as a preferred alternative and once the design of the

project is complete, a project-level CEQA analysis will be required.

Potential Environmental Impacts Associated with Conventional Wastewater Treatment

- Construction and excavation activities have the potential to result in soil erosion, which could adversely impact nearby waterways as a result of siltation and water quality degradation.
- Construction and excavation activities have the potential to result in disturbance to cultural and archaeological resources.
- Construction could result in impacts to threatened, endangered species, or candidate species.
- Construction could result in impacts to nesting birds.
- Construction could result in impacts to wetlands.
- During the construction phase of the project, construction noise would dominate the noise environment in the immediate area.
- Construction of a wastewater treatment plant would not introduce any uses that would generate long-term changes in traffic. Construction of the treatment plant would temporarily increase traffic along haul routes and the main access roads to the WWTP property.
- Construction of a wastewater treatment plant would not change the design of existing roadways and does not include any operational features that would impact traffic or increase hazards. However, large truck traffic associated with the import of material for the construction of the plants could accelerate the deterioration of the roadway surface due to the high number of trips.
- Construction activities will likely generate fugitive dust and diesel exhaust emissions from construction/excavation activities and vehicle/equipment operation.

Possible Mitigation Measures to Avoid Impacts Associated with Conventional Wastewater Treatment

- Off-site impacts due to erosion must be prevented by implementation of a Stormwater Pollution Prevention Plan (SWPPP) as required under the Clean Water Act. Measures to consider in a SWPPP are those related to: grading, existing vegetation, land disturbance during peak runoff periods, utility installations, control of runoff velocity and quality, truck traffic, storage of construction materials, permits, spill prevention, fuel and vehicle maintenance areas, sanitary facilities for construction works.
- In the event of any inadvertent discovery of archaeological resources, all such finds shall be subject to PRC 21083.2 and CEQA *Guidelines* 15064.5, including cessation of work until professional archaeologist or paleontologist can evaluate the significance of the find, professional curation of significant finds, and notification of county coroner and Native American Heritage Commission, if appropriate, if find is a human remain.
- A qualified biologist should be present during initial grubbing and clearing activities to ensure that species identified during the project-level CEQA analysis are not harmed by construction activities. If threatened, endangered, or candidate species are observed, one potential mitigation would be for the

- biologist to relocate it to suitable habitat outside of the construction zone.
- If feasible, grubbing and grading activities should be conducted outside of the nesting season. If initial tree-removal, grubbing or clearing activities will occur during the nesting season, a pre-construction survey for nesting bird species should be conducted by a qualified biologist within proposed vegetation removal areas, including a substantial buffer from construction activities.
 - Construction activities resulting in the discharge of dredged or fill material into Waters of the US will require permit approval from the US Army Corps of Engineers and water quality certification from the Regional Water Board pursuant to Section 401 of the Clean Water Act. Any compensatory mitigation shall be provided as required by regulatory permits to offset impacts to Waters of the US. Compliance with full mitigation, as required by regulatory permits, would ensure that measures are implemented to avoid, compensate, or offset impacts to Waters of the US.
 - Any project in California which will cause alteration to the bed, bank, or channel of a stream will require a Streambed Alteration Agreement pursuant to Section 1600 of the California Fish and Game Code.
 - Construction contractors should be required to implement mitigation measures to reduce daytime noise levels resulting from construction, such as:
 - Fixed construction equipment (such as compressors and generators) and construction staging areas located as far as feasible from the nearest dwellings.
 - Equipment and trucks used for project construction should utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).
 - Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment (per the manufacturer's specifications) and by shrouding or shielding impact tools.
 - Notification should be given to public transportation providers, school districts, emergency service providers, and affected private residents at least one month prior to commencement of construction to minimize traffic congestion issues.
 - Construction related truck trips shall be limited to the hours between 9:00 a.m. to 3:00 p.m., Monday through Friday to the extent possible. No construction traffic should be permitted between the hours of 10 pm. To 7 a.m.
 - Construction traffic shall comply with the California Vehicle Code (CVC) sections related to vehicle weight and width.
 - The construction contractor should implement best management practices designed to reduce the effects of dust and diesel exhaust, including:
 - Water all active construction areas at least twice daily.
 - Cover all trucks hauling soil and other loose materials or require all trucks to maintain at least 2 feet of freeboard.

- Apply water as needed on a daily basis, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- Maintain equipment according to the manufacturer's specifications.
- Restrict idling of construction equipment and vehicles to 10 minutes.
- Gasoline powered equipment and vehicles shall have catalytic converters installed prior to their use on the project site.

9.5.2.4 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Wetlands Restoration

One of the implementation measures considered for achieving compliance with the proposed revised DO objectives, TMDL load allocations and numeric targets is the restoration of wetlands. A large scale restoration project on the Williamson River delta undertaken by Nature Conservancy of Oregon was used as an example in identifying compliance measures.

A project-level CEQA analysis will likely be necessary to ensure that any wetland restoration project is conducted in such a manner as to provide adequate environmental protection. The list of potentially significant environmental impacts below is not intended in any way to restrict the scope of any future project-level CEQA analysis. It is intended only to provide a framework of issues to consider.

Analysis of Compliance Measures for Wetlands Restoration

- Re-establish native wetland and upland vegetation.
- Recreate historic channels.
- Restore historic oxbow channels to allow continuous flow.
- Breach lakeshore levees to create diverse habitat features.
- Lower lake levees to create riparian fringe habitat.

Potential Environmental Impacts Associated with Wetlands Restoration

- Use of heavy equipment to divert flows and dig new channels.
- Use of explosives and/or mechanical equipment to open passages in the levees sufficiently large for water to flow and reconfigure the landscape.
- Large scale planting and temporary irrigation facilities for re-establishing native wetland and upland vegetation.
- Construction and excavation activities have the potential to result in soil erosion, which could adversely impact nearby waterways as a result of siltation and water quality degradation.
- Construction and excavation activities have the potential to result in disturbance to cultural and archaeological resources.
- Construction could result in impacts to threatened, endangered species, or candidate species.

- Construction could result in impacts to nesting birds.
- Construction could result in impacts to existing wetland habitat.
- During the construction phase of the project, construction noise would dominate the noise environment in the immediate area, particularly with the use of explosives.
- Construction of a wetland restoration project would not introduce any uses that would generate long-term changes in traffic. Construction of a wetland restoration project would temporarily increase traffic along haul routes and the main access roads to the restoration site.
- Construction activities will likely generate fugitive dust and diesel exhaust emissions from construction/excavation activities and vehicle/equipment operation.
- Hazards associated with the transport and use of explosives.

Possible Mitigation Measures for Wetlands Restoration

- Off-site impacts due to erosion must be prevented by implementation of a Stormwater Pollution Prevention Plan (SWPPP) as required under the Clean Water Act. Measures to consider in a SWPPP are those related to: grading, existing vegetation, land disturbance during peak runoff periods, utility installations, control of runoff velocity and quality, truck traffic, storage of construction materials, permits, spill prevention, fuel and vehicle maintenance areas, sanitary facilities for construction works.
- In the event of any inadvertent discovery of archaeological resources, all such finds shall be subject to PRC 21083.2 and CEQA *Guidelines* 15064.5, including cessation of work until professional archaeologist or paleontologist can evaluate the significance of the find, professional curation of significant finds, and notification of county coroner and Native American Heritage Commission, if appropriate, if find is a human remain.
- A qualified biologist should be present during initial grubbing and clearing activities to ensure that species identified during the project-level CEQA analysis are not harmed by construction activities. If threatened, endangered, or candidate species are observed, one potential mitigation would be for the biologist to relocate it to suitable habitat outside of the construction zone.
- If feasible, grubbing and grading activities should be conducted outside of the nesting season. If initial tree-removal, grubbing or clearing activities will occur during the nesting season, a pre-construction survey for nesting bird species should be conducted by a qualified biologist within proposed vegetation removal areas, including a substantial buffer from construction activities.
- Construction activities resulting in the discharge of dredged or fill material into Waters of the US will require permit approval from the US Army Corps of Engineers and water quality certification from the Regional Water Board pursuant to Section 401 of the Clean Water Act. Any compensatory mitigation shall be provided as required by regulatory permits to offset impacts to Waters of the US. Compliance with full mitigation, as required by regulatory permits, would ensure that measures are implemented to avoid, compensate, or offset impacts to Waters of the US.

- Any project in California which will cause alteration to the bed, bank, or channel of a stream will require a Streambed Alteration Agreement pursuant to Section 1600 of the California Fish and Game Code.
- Construction contractors should be required to implement mitigation measures to reduce daytime noise levels resulting from construction, such as:
 - Fixed construction equipment (such as compressors and generators) and construction staging areas located as far as feasible from the nearest dwellings.
 - Equipment and trucks used for project construction should utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).
 - Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment (per the manufacturer's specifications) and by shrouding or shielding impact tools.
 - Notification should be given to public transportation providers, school districts, emergency service providers, and affected private residents at least one month prior to commencement of construction to minimize traffic congestion issues.
 - Construction related truck trips shall be limited to the hours between 9:00 a.m. to 3:00 p.m., Monday through Friday to the extent possible. No construction traffic should be permitted between the hours of 10 pm. To 7 a.m.
 - Construction traffic shall comply with the California Vehicle Code (CVC) sections related to vehicle weight and width.
- The construction contractor should implement best management practices designed to reduce the effects of dust and diesel exhaust
- Restrict work to days in which soil detachment by wind or water is not expected.
- Time the completion of work to coincide with planting to reduce the length of time in which bare soil is exposed.
- Cover exposed soil that will not receive immediate planting with straw or other suitable erosion control material.
- Protect drainage channels from sediment contributions with vegetated buffers, wattles or similar erosion control devices.
- Time heavy equipment use to occur during period of good air quality.
- A turbidity curtain can be used to contain turbidity effects within an acceptable minimum location during construction activities.
- Adherence to the industry safety standards for the transport and use of explosives.

9.5.2.5 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Hypolimnetic Oxygenation

Hypolimnetic oxygenation is a technique that adds oxygen to the deeper part of the reservoirs (hypolimnion) without disrupting stratification of the reservoir. This technique

increases the amount of oxygenated water available to organisms that use the deeper and cooler waters of the reservoir, and retards the buildup of un-decomposed organic matter and compounds (e.g., ammonium) in the hypolimnion.

Analysis of Compliance Measures for Hypolimnetic Oxygenation

- Application of fine bubbles
 - Using unconfined fine bubble diffuser
 - Using unconfined and diffuse bubble curtain
- Use of a bubble-free system in which a pressurized container placed at the bottom of the reservoir is used to mix water with gas and the mixture is dispersed over the sediments. The system is operated as soon as monitoring indicates that dissolved oxygen levels in the hypolimnion are starting to drop (early spring) and through the summer/fall.
- Oxygen supply facilities would include a liquid oxygen storage tank, vaporizers, and trucked-in oxygen to be used at locations midway along the reservoirs.
- Small onsite oxygen generators might also be used to supply oxygen near the dams

Potential Environmental Impacts Associated with Hypolimnetic Oxygenation

- Construction of underwater facilities
- Temporary increases in turbidity.
- Disturbance to endangered, threatened or sensitive species.
- Temporary increases in traffic
- Temporary increases in noise
- Increased need for sanitary services
- Liquid oxygen storage tanks present the risk of fire and explosion.

Possible Mitigation Measures for Hypolimnetic Oxygenation

- Iron Gate Reservoir, install 3 long diffuser lines:
 - One upstream end of the reservoir to provide initial oxygenation of incoming organics
 - One upstream of the dam
 - One in the metalimnion along the side of the reservoir
- For Copco Reservoir, install five (5) long diffuser lines:
 - Two (2) at the upstream end of the reservoir to provide initial oxygenation of incoming organics
 - Two (2) upstream and downstream of the bathymetric outcropping
 - One in the metalimnion along the side of the reservoir.
- Install turbidity curtains around construction area to contain any turbidity resulting from construction activities.
- Conduct a project-level CEQA analysis to identify biological resources, including threatened and endangered species and their habitat, requiring protection.
- Avoid construction during periods in which threatened or endangered species are present and/or apply to the appropriate resource agencies for an incidental take permit, if threatened or endangered species may be present.

- Implement best management practices for the reduction and control of vehicle noise, traffic, dust and need for sanitary services, as described above.
- Observe standard safety procedures for the locating, installation, and use of liquid oxygen, including:
 - Keep combustibles away and eliminate ignition sources.
 - Keep the area and exterior surfaces clean to prevent ignition.
 - Maintain adequate ventilation.
 - Ensure personnel use proper safety gear when there is any risk of splashing or spilling liquid oxygen.
 - Ensure replacement parts are suitable for oxygen service.

9.5.2.6 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Epilimnion Circulation

The epilimnion is the upper layer of a thermally stratified lake or reservoir where photosynthetic activity takes place. Epilimnion circulation is intended to induce vertical circulation thereby reducing cyanobacteria by reducing their light exposure and disrupting the generally quiescent conditions that may contribute to bloom formation.

Analysis of Compliance Measures Associated with Epilimnion Circulation

- Use solar-powered water circulators.

Potential Environmental Impacts Associated with Epilimnion Circulation

- Disruption of cyanobacteria by agitation may result in the lysing of cell membranes and release of microcystin toxin to the water column.

Possible Mitigation Measures with Epilimnion Circulation

- Conduct a demonstration installation of a higher-energy circulator in a selected cove and compare water quality outcomes to an untreated cove.
- Monitor microcystin levels, upon full-scale installation.
- Stop mechanical circulation if microcystin levels increase as a result of the activity.

9.5.2.7 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Riparian Restoration

Responsible parties in the Klamath River basin, including PacifiCorp, may use riparian restoration to improve in-stream temperature conditions by restoring the site-potential for riparian shade. Restoration activities will generally include the reduction of activities in a riparian buffer zone. Tree planting may include the importation of saplings, equipment and personnel; the hand digging of holes; and the installation of irrigation facilities. Measures to stabilize a stream bank and/or remove/repair riparian roads may include the use of heavy equipment, importation of rip rap or other materials, and/or temporary rerouting of stream flow.

Analysis of Compliance Measures Associated with Riparian Restoration

- Reduction of tree harvesting, grazing, and irrigated agricultural activities.
- Stream bank stabilization to support shade species.

- Include tree planting, and where necessary.
- Removal or repair of roads in riparian areas.

Potential Environmental Impacts Associated with Riparian Restoration

- Temporary construction-related discharges of sediment
- Temporary air quality impacts from heavy equipment use
- Impacts to archaeological and cultural resources
- Temporary impacts to plant and animal species, including disturbance to habitat.
- Temporary impacts to water quality from construction-related increases in turbidity.

Possible Mitigation Measures with Riparian Restoration

- Restrict work to days in which soil detachment by wind or water is not expected.
- Time the completion of work to coincide with planting to reduce the length of time in which bare soil is exposed.
- Cover exposed soil that will not receive immediate planting with straw or other suitable erosion control material.
- Protect drainage channels from sediment contributions with vegetated buffers, wattles or similar erosion control devices.
- Time heavy equipment use to occur during period of good air quality.
- Conduct a project-level CEQA analysis to identify archaeological and cultural resources requiring protection.
- Conduct a project-level CEQA analysis to identify biological resources, including threatened and endangered species and their habitat, requiring protection.
- A turbidity curtain can be used to contain turbidity effects within an acceptable minimum location during construction activities.

9.5.2.8 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Selective Withdrawal from a Variable Outlet Structure

PacifiCorp will evaluate the installation of a variable outlet structure from which to selectively withdraw water for release. A variable outlet structure is constructed on the inside of the dam face. To retrofit an existing dam with a variable outlet structure requires that the reservoir water be held back from the inside of the dam by such means as a coffer dam while the infrastructure is installed. Once infrastructure construction is completed, the coffer dam is removed, and the release of water downstream is resumed.

A variable outlet structure allows the operator to draw water from various depths in the reservoir. This flexibility allows the operator to respond to water quality conditions of the reservoir and the water quality needs of the river downstream so as to release water that most closely meets the overall environmental objectives.

A rigorous monitoring program is required to provide the operator with sufficient information regarding the temperature, DO concentration, *Microcystis* concentrations, microcystin concentrations, and other water quality characteristics.

Analysis of Compliance Measures Associated for Selective Withdrawal from a Variable Outlet Structure

- Install coffer dam.
- Install necessary infrastructure for outlet.

Potential Environmental Impacts for Selective Withdrawal from a Variable Outlet Structure

- Impacts as typically associated with construction activities.

Possible Mitigation Measures Protection for Selective Withdrawal from a Variable Outlet Structure

- Mitigations for construction activities such as described above.

9.5.2.9 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Curtain Installation at Iron Gate Dam

In 2008, PacifiCorp installed a floating barrier curtain along the log boom in the Iron Gate reservoir near the dam intake. The primary objective of the barrier curtain was to enhance water quality in the vicinity of the dam intake by excluding or reducing the potential entrainment of biomass from blooms of cyanobacteria such as *Microcystis* and potential associated algal toxins (i.e., microcystin).

Use of a turbidity curtain is often for the purpose of controlling the release of sediment to the water column as a result of instream work. The turbidity curtain acts to slow and contain turbidity until it can settle out of the water column. It is unclear whether use of the turbidity curtain for controlling algae is intended to work in the same way. The Reservoir Management Plans for 2008 and 2009 do not describe the details of use. This analysis is based on the assumption that algal cells, when contained by a turbidity curtain, will decompose and settle out of the water column, and remain in the reservoir as settled organic matter, rather than be released downstream. A project level CEQA analysis must clarify the details of this implementation measure.

PacifiCorp proposes to monitor its effectiveness during 2009, including:

1. Water quality monitoring within and without the curtained area;
2. Current monitoring in the vicinity of the curtain to characterize vertical velocity profiles; and,
3. Modeling to assess curtain effects on water quality under varying conditions.

Analysis of Compliance Measures Associated for Curtain Installation at Iron Gate Dam

- Install turbidity curtain made of synthetic fabric material, suspended down 10 feet and across the width of the reservoir, a distance of 1100 feet, approximately 1800 feet upstream of the dam

Potential Environmental Impacts for Curtain Installation at Iron Gate Dam

- Release of microcystin toxin to the water column as algal cells lyse.
- Interference of fish movement through a compliance lens, if lens occupies a space within 10 feet of the surface.

Possible Mitigation Measures Protection for Curtain Installation at Iron Gate Dam

- Implement monitoring program sufficiently rigorous to detect increases in microcystin toxin to the water column. Post public warnings if microcystin concentrations exceed target levels as described in the Klamath TMDL.
- Remove turbidity curtain and evaluate alternative microcystin controls if turbidity curtain does not meet the objective of excluding or reducing the potential entrainment of algal toxins.
- Implement a monitoring program sufficiently rigorous to detect the dimensions of the compliance lens (i.e., water quality conditions meeting both DO and temperature objectives) and if within 10 feet of the surface, whether fish movement is impaired.
- Remove turbidity curtain and evaluate alternative Microcystis and microcystin controls if turbidity curtain impairs fish movement through the compliance lens.

9.5.2.10 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Turbine Venting

According to PacifiCorp, the Klamath River downstream of Iron Gate dam periodically experiences during summer months, low dissolved oxygen emanating from the deep reservoir intake on Iron Gate Reservoir. PacifiCorp conducted turbine venting tests in the summer of 2008 to determine if full air admission through the existing turbine vent valve could positively improve the dissolved oxygen (DO) of discharged water. The tests indicated that DO could be increased up to 2 mg/L and 20% saturation. PacifiCorp plans to install a forced-air blower on an existing (but previously closed) air introduction manifold to increase air entrainment into the turbine draft tube. This should then increase DO concentration below the Iron Gate powerhouse. Should these tests prove further success with the technique, turbine venting will be used as an interim implementation measure to improve DO conditions downstream of Iron Gate Dam.

Analysis of Compliance Measures Associated for Turbine Venting

- Install a forced-air blower on an existing, but previously closed, air introduction manifold.

Potential Environmental Impacts for Turbine Venting

- None identified.

Possible Mitigation Measures Protection for Turbine Venting

- Not applicable.

9.5.2.11 Analysis of Compliance Measures, Potential Environmental Impacts and Possible Mitigation Measures for Dam Decommissioning Activities

As described previously (see section 9.5.2) the decommissioning (or removal) of one or more of the existing dams that comprise the KHP have been the subject of much discussion and investigation as part of PacifiCorp's FERC relicensing efforts. A number of reports have been produced by various groups evaluating the potential environmental effects of a number of dam removal scenarios. The reports used in the preparation of this CEQA analysis are incorporate herein by reference and include:

- *The Final Environmental Impact Statement for Relicensing of the Klamath Hydroelectric Project No. 2082-027* (FEIS) released by the Federal Energy Regulatory Commission on November 16, 2007 (FERC 2007). This FEIS contains, in part, evaluations of two dam removal scenarios. One alternative involves the retirement of the Iron Gate and Copco No. 1 developments (dams and associated hard structures). The other involved the retirement of Iron Gate, Copco No. 2, Copco No. 1, and J.C. Boyle developments. This report¹³ is available at the following web site:
<http://www.ferc.gov/industries/hydropower/enviro/eis/2007/11-16-07.asp>.
- *Klamath River Dam and Sediment Investigation* (November 2006) prepared by Gathard Engineering Consulting, at the request of the California State Coastal Conservancy and the Ocean Protection Council (Gathard Engineering Consulting 2006). This report characterized the sediment behind Iron Gate, Copco No. 1 and 2, and J.C. Boyle and examined the possibility of removing these dams removal. This report¹⁴ is available at the following web site:
<http://www.fws.gov/yreka/KRI/GECFinalReport.pdf>.
- *Dam Removal and Klamath River Water Quality: A Synthesis of the Current Conceptual Understanding and an Assessment of Data Gaps*. This report was prepared by Stillwater Sciences (2009a) at the request of the State Coastal Conservancy and describes, in part, potential water quality impacts of dam removal. This report¹⁵ is available from the following web site:
<http://www.stillwatersci.com/resources/2009klamathWQsynthesis.pdf>.
- *Effects of Sediment Release following Dam Removal on the Aquatic Biota of the Klamath River* (January 2009) prepared by Stillwater Sciences (2009b) at the request of the State Coastal Conservancy and describes, in part, potential water quality impacts to aquatic biota from dam removal. This report¹⁶ is available at the following web site:
<http://www.stillwatersci.com/resources/2009klamathdamremovalBA.pdf>.

¹³ Report downloaded, November 23, 2009.

¹⁴ Report downloaded, November 23, 2009.

¹⁵ Report downloaded, November 23, 2009.

¹⁶ Report downloaded, November 23, 2009.

All of these reports make clear that additional studies and more detailed project designs are needed before a complete environmental analysis of any dam decommissioning scenario can be completed. However the reports also contain as thorough an evaluation of the environmental impacts and costs associated with dam removal as is possible at this time due to the speculative nature of the actual project(s). Any dam decommissioning activity would require a full environmental analysis of the decommissioning plan as part of the federal and/or state permitting process. (For a more detailed discussion on dam removal scenarios, compliance measure, environmental effects and potential costs, please see these reports above, which are incorporated here by reference.)

Most of the dam removal scenarios evaluated in these reports consists of decommissioning either two or four of the dams and reservoirs by removal of the dam structures and most of the appurtenant structures. Physical removal of the dam structure will require drawing down (lowering) of each reservoir sufficiently to allow safe access to the dam structure. Approximately 1.3 to 2.9 million metric tons of fine-grained sediment (sand, silt and clay) is estimated to be stored behind the four dams associated with the KHP. Dam removal studies done on the Klamath indicate that the greatest potential for adverse environmental effects is from the release of fine grained sediment during the lowering of the reservoir surface water elevation. Removal of the dam structures would involve either demolishing most concrete structures at the dam sites or excavating earth embankment at earthen structure dams. Drilling and blasting techniques, followed by heavy equipment operations would likely be used in the removal of concrete structures. Earthen material in embankment dams and on dam approaches would be removed using heavy equipment or in other cases may be removed through stream erosion. Drawdown of the reservoirs would be implemented through a progressive series of actions, including breaching the dams in a planned sequence and in such a way as to establish a rate of reservoir lowering that will result in the most controlled discharge of the fine grained sediment.

All the studies recommend allowing natural erosion of in-reservoir sediment by the stream system rather than relying on mechanical excavation of the sediment, unless contaminated sediments are present. Previous cost analysis have shown that the cost of mechanically excavating in-reservoir sediment is cost prohibitive and can result in more discharge of uncontrolled fine sediment. It is expected that not all sediment trapped behind the reservoirs would be delivered to the river. Sediment outside of the active river channel(s) will likely remain in place. The limited studies conducted to date do not indicate that significant source of contaminated sediments are present behind the reservoirs. However, additional characterization of the sediments would be required prior to any dam decommissioning operations.

Analysis of Compliance Measures Associated with Dam Decommissioning

- Develop a dam decommissioning plan which would contain at a minimum:
 - Clearly stated goals and objectives for decommissioning;
 - Specific and detailed decommissioning methods (blueprints) containing relevant information such as:

- Drawdown plan to lower reservoir surface water level to allow safe access to dam structures.
- Remove concrete dam and appurtenant structures by drilling, blasting, and mechanical removal.
- Remove earthen dam and appurtenant structures by mechanical removal and/or erosion by river.
- Identification of mitigation measures such as timing requirements, sequential decommissioning of dams to control release of turbid and consideration of ocean conditions to lessen adverse environmental impacts; and a
- Monitoring and reporting component to document compliance with the goals and objectives.

Potential Environmental Impacts from Dam Decommissioning

- Short term aesthetics impacts from freshly exposed reservoir bottom and sides.
- Long term aesthetics impacts from the presence of dam and appurtenant structures on the landscape.
- Short term air quality impacts from greenhouse gas emissions from heavy equipment and blasting operations.
- Short term air quality impacts from release of air-born particle matter from blasting activities.
- Short term air quality impacts from offensive odors affecting the surrounding community from exposure of anaerobic sediments.
- Short term biological impacts due to increased duration and concentration of in-stream fine sediment (total suspended sediment). Studies indicate between 1.3 and 2.9 million metric tons of fine sediment are stored behind four of the dams associated with the KHP (J.C. Boyle in Oregon and the three California dams Copco 1 and 2 and Iron Gate).
- Short term biological impacts due to increased turbidity and total suspended sediment loads from erosion of earthen dams and approaches.
- Short term and long term biological impacts from release of contaminated sediments (e.g., metals, VOCs, pesticides and herbicides, dioxin).
- Short term biological impacts due to loss of riparian habitat surrounding the reservoirs.
- Short term biological impacts from heavy equipment used to install structural compliance measures such riparian fencing, erosion control on road systems and reconstruction of failed/failing stream crossings.
- Long term biological impacts from transmission of fish disease upstream and from increased water temperatures during the spring time downstream of the dams.
- Long term biological impacts from introduction of invasive species on exposed reservoir surfaces.
- Long term biological impacts from loss of reservoir acres available for resting of migratory waterfowl and foraging on open water by piscivorous birds and bats.
- Long term cultural impacts from exposure of previously submerged cultural

- resources, subject them to looting.
- Short term hydrology/water quality impacts from release of in-reservoir stored organic carbon (including nitrogen and phosphorus), which could also include dissolved oxygen conditions below the proposed DO objective of 85% saturation and lower than the current 8.0 mg/L due to increased oxygen demand from the decomposition of organic material in suspended sediment.
 - Long term hydrology/water quality impacts from increased wintertime total suspended sediment and turbidity, with peak levels associated with storm events.
 - Long term hydrology/water quality impacts from episodic increased levels of total suspended sediment and turbidity during late spring and summer due to transport of algae blooms from the upper Klamath River.
 - Long term hydrology/water quality impacts on the annual nutrient budget.
 - Long term hydrology/water quality impacts from increased average annual flow and magnitude and frequency of floods.
 - Short term impact from noise generating activities such as heavy equipment use and blasting activities.
 - Long term recreation impacts from decreases acres of reservoir available for flat-water recreation and warm water fishing and the subsequent re-direction of reservoir users to other neighborhood or regional recreation areas.

Possible Mitigation Measures for Dam Removal Activities

- Include a native vegetation management as part of any dam decommissioning actions to mitigate any short term aesthetics and long term biological impacts from introduction of invasive species on exposed reservoir surfaces.
- Remove all hardscape (e.g. dams, powerhouses, power lines, etc) associated with the dam and hydroelectric project to mitigate for long term aesthetics impacts from the presence of dam and appurtenant structures on the landscape.
- Conduct activities on days when inversion layer is not present and basin air quality is good, use fuel efficient equipment, and limit number of vehicle trips to the sites to offset short term air quality impacts from greenhouse gas emissions from blasting and heavy equipment operations.
- Control access to site, conduct activities when wind direction will not take particle matter into populated areas to mitigate short term air quality impacts from release of air-born particle matter from blasting activities.
- Inform surrounding communities of dam decommissioning plans to allow voluntary re-location during periods when offensive odors from exposure of anaerobic sediments from dam removal are present.
- Design reservoir drawdown plans to limit the duration of the increased turbidity and total suspended sediment loads to mitigate for the short term biological and water quality impacts from release of in-reservoir fine grained sediment.
- Divert surface water away from construction sites to decrease turbidity and total suspended sediment loads to mitigate for the short term biological and water quality impacts from removal of the dam and appurtenant structures.
- Conduct dam decommissioning operations to coincide with a strong year class of fall Chinook to allow for rapid re-colonization to mitigate for a long term

biological impacts from transmission of fish disease upstream and from increased water temperatures during the spring time downstream of the dams.

- Coordinate with local tribes to develop a cultural resources management plan that contains mitigation measures such as relocation, reburial or other protection strategies to mitigate for long term cultural impacts from exposure of previously submerged cultural resources.
- Time dam decommissioning to “wet” hydrologic year to facilitate flushing to mitigate for the short term hydrology/water quality impacts from release of in-reservoir stored organic carbon (including nitrogen and phosphorus). The multi-year analysis of Asarian et al. (2009) shows the combined annual retention for Copco and Iron Gate reservoirs is nine percent (9%) for total phosphorous and thirteen percent (13%) for total nitrogen. These increased nutrient loads will likely have minimal, if any, water quality impacts downstream. The minimal water quality impact can be attributed to the following:
 - Retention within the reservoirs occurs largely in the winter and early spring when nutrients exist in a particulate form which is less bioavailable;
 - The higher flows (as a result of a dams out scenario) will carry most of the nutrient load through the system and out to the ocean.
 - The winter and early spring loading period is not a critical growth period for periphyton or phytoplankton; and
 - Increase scouring of the downstream periphyton as a result of increase flow.
- The impacts on organic matter cycling from dam removal activities is offset in part due to the export of organic carbon (phytoplankton) in the summer months that will occur if dams are not in place. The increased nutrient and organic matter load without reservoirs can be mitigated through the development of treatment wetlands and restored natural wetlands.
- Prevent the development of hard structures in the floodplain that are not designed to handle the anticipated increased floods to mitigate for the long term hydrology impacts from increase average annual flow and magnitude and frequency of floods. Iron Gate, Copco 1 and Copco 2 reservoirs are small and have not been managed to attenuate peak flows. In addition a very small percentage of the flood flows ($\leq 10\%$) originate upstream of the reservoirs. The vast majority of flood flows ($\geq 90\%$) originate downstream of Iron Gate dam.
- Re-vegetate exposed soils along the river banks and floodplains to prevent the long term hydrology/water quality impacts from increased wintertime total suspended sediment and turbidity, which have peak levels during storm events.
- Time dam decommissioning to “wet” hydrologic year to facilitate flushing to mitigate for the long term hydrology/water quality impacts from episodic increased levels of total suspended sediment and turbidity during late spring and summer due to transport of algae blooms from the upper Klamath River.
- Staff has determined that no compliance measures are necessary to mitigate for the long term hydrology/water quality impacts from increase average annual flow and magnitude and frequency of floods in large part as the reservoirs were not designed for flood protection. These reservoirs were designed to have a low residence time and especially under peak flows they did little to reduce peak

- hydrograph flows downstream.
- Notify landowners adjacent to blasting sites of the planned use of explosives, restrict public access to the sites and plan explosives operations to take into account noise considerations to mitigate for the short term impacts from noise generating activities such as heavy equipment use and blasting activities.
 - Redirect existing reservoir (flatwater) users to the twelve (12) other existing reservoirs/lakes in the region, conduct a survey of the existing recreation facilities at the other reservoir/lakes as part of any dam decommissioning plan, include recreational facility installation/upgrade at the existing flatwater areas to mitigate for any long term recreation impacts from decreased acres of reservoir available for flat-water recreation and warm water fishing and the subsequent re-direction of reservoir users to other neighborhood or regional recreation areas.

Although potentially significant adverse impacts from dam removal were identified, it is impossible without further study to know whether those impacts may be able to be mitigated to less than significant levels. If the Settlement Parties decide to go forward with decommissioning of one or more of the dams, additional environmental review will be required at that time. If, at that time, adverse environmental impacts are identified that cannot be mitigated to less than significant levels, the Regional Water Board, when required to take a discretionary action for approval of dam decommissioning as a final TMDL compliance measure, will balance the economic, legal, social, technological, or other benefits of removing the dams against any identified unavoidable environmental risks when determining whether to approve the project, and make a statement of overriding considerations, if it finds that the adverse environmental impacts are acceptable given the identified benefits. At this time, however, the Regional Water Board is not taking any action to approve decommissioning of one or more of PacifiCorp's dams and there is insufficient information for the Regional Water Board to know what potential impacts exist, if they can be mitigated to less than significant levels, and if not, whether the benefits outweigh those potential impacts.

9.5.3 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Iron Gate Hatchery

Iron Gate Fish Hatchery is owned by PacifiCorp and operated by the California Department of Fish and Game (CDFG). The hatchery is located at the base of Iron Gate Dam and discharges effluent into the mainstem Klamath River. The TMDL assigns temperature, nutrient, and organic matter waste load allocations, as well as temperature, DO, nutrient and organic matter targets to discharges from Iron Gate Hatchery. The waste load allocations, based in part on the proposed revised DO objectives, to the Iron Gate Hatchery discharges will be implemented through the federal NPDES permit, which is held jointly by CDFG and PacifiCorp.

The issues associated with the Iron Gate Hatchery are complex due to the location and issues surrounding the hatchery operation. Site-constraints and technical

factors make it necessary for an engineering study to be completed before a full environmental analysis can be completed for the hatchery aspect of the TMDL.

The TMDL compliance schedule to accompany the new permit may allow additional time needed for CDFG to make any infrastructure improvements to the hatchery and to implement management measures that meet TMDL allocations. The time schedule will include specific intermediate milestones with the final goal of meeting the Klamath TMDL allocations and targets. Intermediate milestones for pollutant reductions in the hatchery discharges may include:

1. Improving effluent water quality to the level of the intake water to the hatchery; and
2. Meeting current receiving water quality in the Klamath River at the point of discharge.

The hatchery may have the option of achieving some or all of its waste load reductions through offset mitigation if the potential changes to hatchery operations are limited in their ability to effectively reduce pollutant loads.

9.5.3.1 Analysis of Compliance Measures Associated for Iron Gate Hatchery

- Improvements to settling ponds.
- Improvement in treatment technologies (such as installation of a package treatment plant).
- Modifications to plant operations.
- Engage in potential off-sets program, including up-stream treatment activities.

9.5.3.2 Potential Environmental Impacts for Iron Gate Hatchery

- Impacts as typically associated with construction activities.

9.5.3.3 Possible Mitigation Measures Protection for Iron Gate Hatchery

- See mitigations below (Section 9.5.5) for use of heavy equipment and other infrastructure impacts.

9.5.4 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Tributaries

The tributaries to the Klamath River include five major tributaries and numerous minor tributaries. The major tributaries are the Trinity, Salmon, Scott, Shasta and Lost Rivers. All the major tributaries, except the Lost River, join the Klamath River in California and are also wholly contained within California. The Lost River traverses the Oregon/California border three times and ultimately joins the Klamath River in Oregon via the Klamath Straits Drain. The major tributaries each have had technical TMDLs completed that are specific to the tributary basin. The Regional Water Board has adopted TMDL implementation plans for the Shasta, Scott, and Salmon River basins. The Trinity, South Fork Trinity, and Lost River basins have had TMDLs promulgated by the USEPA without associated implementation plans. Lost River actions are included in those contained in the Stateline discussion.

The Klamath River TMDLs assign nutrient and organic matter load allocations to all the major Klamath tributaries in California and eighteen (18) specified minor tributaries to ensure that water quality standards in the mainstem, including the proposed revised DO objective, of the Klamath River are met. The Shasta River is the only tributary in California that has an existing TMDL with nutrient and organic matter-related allocations.

The Klamath River TMDL allocations to the Shasta River are consistent with the allocations assigned in the Shasta River TMDLs.

The Lost River discharges to the Klamath River in Oregon and as such the allocations for the Lost River are included as part of the Oregon Klamath River TMDLs.

It is anticipated that the Scott River TMDL includes the necessary sediment and temperature control measures to meet the Klamath River TMDL watershed-wide temperature allocations and targets and will be consistent with the proposed prohibition on the discharge of excess sediment.

Regional Water Board staff is currently working with the U. S. Forest Service on the development of a Memorandum of Understanding (MOU) that would provide the framework for the implementation (compliance) measures that would be undertaken in the Salmon River basin. These compliance measures would be formalized in WDRs/waiver that would require compliance with the proposed revised DO objectives, Klamath TMDL allocations and targets.

The Trinity River is assigned nutrient and organic matter allocations in the Klamath River TMDL. The implementation measures described in Section 6.5 apply to the Trinity River watershed. Implementation of sediment and riparian control measures to meet the watershed-wide temperature allocations and targets applicable to the Trinity River are expected to be sufficient to meet the nutrient and organic matter allocations for the Trinity River. The Klamath River TMDLs was modeled on the Trinity River Restoration Program (TRRP) Record of Decision, including flows. These actions, including flow levels were previously analyzed under NEPA, therefore no CEQA analysis is required for these actions. The restoration portion of TRRP (EIS circulating now

The compliance measures that might reasonably be implemented in the eighteen (18) minor tributaries are discussed below in the section on compliance measures for the proposed watershed wide allocations and targets.

9.5.4.1 Analysis of Compliance Measures Associated for Tributaries

- No additional compliance measures identified beyond those required under existing TMDLs, watershed programs or with the application of the watershed wide allocations discussed below.

9.5.4.2 Potential Environmental Impacts for Tributaries

- Not applicable.

9.5.4.3 Possible Mitigation Measures Protection for Tributaries

- Not applicable.

9.5.5 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Actions to Comply with the Watershed Wide Allocations and Targets and Proposed Revised DO Objective

The environmental analysis of the compliance measures, potential impacts and possible mitigation measures to avoid those impacts is presented below. It is generally organized to correspond with the organization of the proposed implementation actions present in Chapter 6 of this Staff Report. This analysis includes a discussion on:

- Road construction and maintenance (on both public and private lands, unlike the Staff Report).
- Grazing.
- Irrigated Agriculture.
- Timber Harvest (on both public and private lands).
- Fire Management on U.S. Forest Service Lands (a component of the discussion on land management activities on Federal lands in Chapter 6 of the Staff Report).

9.5.5.1 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Road and Crossing Construction and Maintenance Activities

Discharge of sediment from roads and watercourse crossings was identified during development of the TMDLs as contributing to the temperature impairment of the Klamath River. The draft Klamath River TMDLs (Chapter 5, Allocations and Numeric Targets, page 5-14) concludes that “stream temperature increases from human-caused discharge of sediment constitute an exceedence of the water quality objective for temperature” and establishes a temperature-related load allocation. The proposed temperature-related load allocation equals:

- Zero (0) temperature increase caused by substantial human-caused sediment-related channel alteration¹⁷.

The draft Klamath River TMDLs also proposes the inclusion of three road and crossing related targets to control temperature impacts from human-caused sediment sources. The crossing related targets (or goals) include:

¹⁷ As used in this analysis, substantial human-caused sediment-related channel alteration is defined as “A human-caused alteration of stream channel dimensions that increase channel width, decrease depth, or remove riparian vegetation to a degree that alters stream temperature dynamics and is caused by increased sediment loading”.

- Zero (0) miles of substantial human-caused sediment related channel alteration.
- Less than one percent (1%) of all stream crossings divert or fail as a result of a 100-year or smaller flood.

The proposed road-related target is as follows:

Decreasing number of potential road-related landslide source areas.

See Chapter 5 of this Staff Report for more on load allocations and numeric targets.

To attain the load allocations and reach the proposed targets, the draft implementation program (see Chapter 6 of the Staff Report for more information) proposes the use of all three of the regulatory approaches mandated by the California Water Code and reaffirmed in the State's 2004 Non-Point Source Policy (i.e., application of prohibitions, WDRs, and conditional waivers of WDRs) to control discharge of excess sediment from road and crossing construction and maintenance activities. See Chapter 6 for more on the Non-Point Source Policy.

The Klamath TMDLs identify the following parties as responsible for road and crossing construction and maintenance activities:

- US Forest Service (USFS)
- US Bureau of Land Management (BLM)
- State of California (Caltrans)
- Del Norte, Humboldt, Siskiyou and Trinity Counties (Counties)
- Private landowners, including timber, agricultural and residential

New road construction, except for on statutorily exempt land uses (e.g. agricultural and timber) are required to obtain coverage under the Statewide construction stormwater permit if the road results in point source discharge to waters of the State.

The USFS currently has waiver coverage for the roads associated with their silvicultural activities (Order Nos. R1-2004-0015 and R1-2009-0028). The conditional waiver is based on the understanding that the existing USFS road-related BMP program is implemented. The existing waiver will expire on December 10, 2009. Regional Water Board staff is currently working with the USFS on a revised permit which would include, in part, additional categories of land use (e.g., pre- and post-fire treatment), road design and construction standards, and a monitoring program. The suite of compliance measures that will be used on USFS roads likely will be similar regardless of the land use associated with the road use (e.g. timber, recreation, or grazing) or the regulatory approach that is used (e.g. prohibitions, WDRs, or conditional waivers of WDRs). The proposed implementation plan recommends the use of the proposed "*Prohibition of Discharges in Violation of Water Quality Objectives in the Klamath River Basin*" for those roads (including on USFS lands) that are not covered by an applicable State or Regional Water Board permit. As staff resources are made available, new or revised permits will be developed to cover a wider range of activities providing additional coverage options. Because road-related compliance measures are not currently required

for roads not covered by the USFS silvicultural waiver, the full suite of road-related compliance measures, potential impacts and possible mitigation measures will be evaluated in this environmental analysis.

Currently, discharge of excess sediment from roads on lands managed by the US Bureau of Land Management (BLM) is unregulated. As stated above, the implementation plan proposes the application of the “*Prohibition of Discharges in Violation of Water Quality Objectives in the Klamath River Basin*” until such time as applicable permits are developed. Because the implementation of road-related compliance measures to control excess sediment is currently not required for roads under BLM’s jurisdiction, the full suite of road-related compliance measures will be evaluated for potential adverse impacts and possible mitigation measures as part of this environmental analysis.

Discharges of waste from roads under the control of the State of California are the responsibility of Caltrans. These discharges are regulated under the State Water Board *NPDES Permit for Storm Water Discharges from the State of California, Department of Transportation (Caltrans) Properties, Facilities and Activities* (Order No. 99–06-DWQ). The draft Klamath River TMDL and implementation plan proposes the inclusion of three measures to address water quality impacts of Caltrans facilities and activities in the Klamath River watershed. One addresses the control of excess sediment, the second addresses barriers to migratory fish, and the third is addresses riparian shade to meet the temperature load allocation. Thus, this environmental analysis will evaluate likely compliance measures designed to control excess sediment discharge and to alleviate barriers to migratory fish passage and to protect or restore riparian shade.

No formally adopted regulatory framework currently exists for discharges of excess sediment from existing county-controlled road systems in the Klamath River watershed. However, the Counties (Humboldt, Del Norte, Trinity and Siskiyou) are all participants in the Five Counties Salmonid Conservation Program (5C Program). The 5C Program is guided by a management practices manual titled “*A Water Quality and Stream Habitat Protection Manual for County Road Maintenance in Northwestern California Watersheds*” which was endorsed by the National Marine Fisheries Service (NMFS) in 1999. As part of their approval, NMFS made the following determination: “all adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts”. The compliance measures (BMPs) recommended in the Road Management Plan are widely recognized as being effective in the control of sediment discharge from roads and watercourse crossings and are used by a number of responsible parties throughout California to control sediment discharges from rural road networks, and associated sediment-related impacts to water quality and aquatic resources. Since the implementation proposes certification of the 5C Program, the likely suite of compliance measures will be evaluated as part of this environmental analysis.

The final category of roads considered as part of this environment analysis includes roads owned by private landowners such as timberland owners, ranchers, farmers and rural residents. Roads on privately owned timberlands are covered under the existing timber WDRs or conditional waiver. The discharge of excess sediment from the remainder of

these existing road systems is currently unregulated. As with the other categories of roads described above, the proposed implementation plan recommends the application of the “*Prohibition of Discharges in Violation of Water Quality Objectives in the Klamath River Basin*”, until such time as additional permits are developed.

Regional Water Board staff have identified a broad range of compliance measures to be analyzed as part of this environmental analysis. The compliance measures identified by Regional Water Board staff as likely being needed to meet the TMDL load allocation and numeric targets are presented below. An evaluation of the environmental impacts associated with implementation of specific measures or groups of measures and potential mitigation measures to decrease environmental impacts is also provided below.

As part of the Klamath River TMDL implementation plan, all landowners in the Klamath River watershed are encouraged to implement measures to control the discharge of excess sediment from their road systems. This includes the treatment of the road surfaces, cut and fill slopes, and drainage facilities, as appropriate, to prevent discharge of excess sediment. A number of compliance measures are available to control the discharge of excess sediment from the road system. Selection of compliance measures depends on a number of site specific factors including, but not limited to:

- Road surface material;
- Road drainage design;
- Timing and intensity of road use;
- Proximity of roads to watercourses;
- Proximity of roads to unstable or landslide prone areas; and
- Public health and safety concerns.

All of these factors should be considered during the selection, design and implementation of appropriate compliance measures. Due to the comparable nature of many of the identified compliance measures, potential environmental impacts will be analyzed in groups, regardless of who owns or controls the road system.

Analysis of Compliance Measures, Potential Environmental Impacts and Possible Mitigation Measures to Control Impacts from Road Construction and Maintenance Activities

Depending in part on the factors described above, a number of compliance measures to control excess sediment from the road surfaces (or the travelled portion of the road way) are available and routinely implemented by those parties responsible for roads in California.

Analysis of Compliance Measures to Control Impacts from Road Construction and Maintenance Activities

Compliance measures include treating the surface with the appropriate material to prevent expected road use from destabilizing the road surface. Surface stabilization measures include:

- Paving the road (asphalt)
- Chip sealing (gravel and petroleum-based binder)
- Rocking
- Dust abatement of native surface roads

Discharge of excess sediment from road fill slopes and cutbanks will require the implementation of compliance measures to prevent soil erosion or mass wasting. Fill slope and cut slope compliance measures include:

- Removal/stabilization of unstable fill
- Soil stabilization (mulching/vegetation) of fill and cut slopes.

An important factor in controlling discharge of excess sediment from road systems is properly designed road drainage and an active maintenance program. Compliance measures to control discharge of excess sediment as a result of drainage treatments are presented below based on road drainage design.

Insloped roads are those roads designed and constructed to drain the road surface towards the cutbank. Road and cutbank runoff is collected in an inboard ditch and drained with a series of cross drains, either directly to watercourses or onto the hillslope. Compliance measures to control discharge of excess sediment from insloped roads include:

- Disconnect road drainage from watercourses (drain to hillslopes).
- Install drainage structures at intervals that prevent erosion of the inboard ditch or gully formation at the hillslope outfall.
- Outslope the road.

Outsloped roads are those roads designed and constructed to drain the road surface towards the hillslope and away from the cutslope. This type of road design prevents the concentration of road surface runoff that could result in hillslope gully formation or discharge of road surface material directly into watercourses. Compliance measures to control discharge of excess sediment from outsloped roads include:

- Maintain outslope to prevent the concentration of road runoff.

Crowned roads are those roads designed and constructed to drain the road surface in two directions. Part of the road prism is drained towards the hillslope with the remainder of the road prism drained towards the cutslope. Hence, compliance measures to control discharge of excess sediment from crowned roads are the same as those identified above for insloped and outsloped roads.

Potential Environmental Impacts Associated with Road Related Compliance Measures

- Excess sediment discharge in violation of prohibition and exceedence of objectives from soil disturbance, earth movement and mass wasting or landslide events.
- Air quality impacts from heavy equipment use.

- Impacts to cultural sites from equipment use.
- Wildlife species impacts from disturbance to habitat.
- Increase in landslide hazard from placement of road cut and fill.
- Decrease in instream flows from water withdrawal for dust abatement.
- Alteration of natural hydrology by concentrating or redirecting road runoff.

Possible Mitigation Measures to Avoid Environmental Impacts Associated with Road Related Compliance Measures

- Install and maintain erosion control measures (e.g. waterbars, rolling dips, mulch, rock rip-rap) to prevent discharge of excess sediment from soil disturbing activities.
- Relocate roads away from unstable and landslide prone terrain.
- Drain roads away from unstable areas during construction, reconstruction of maintenance activities.
- Locate new roads on stable ground to the maximum extent practicable. Consult with professional geologist or engineer if road must be construction across landslide prone terrain.
- Time heavy equipment use to occur during periods of good air quality.
- Consult with Tribes, historical societies, federal, state and local agencies regarding location of cultural resources prior to use of heavy equipment in areas with known or suspected cultural resources.
- Consult with federal, state and local agencies regarding location of sensitive (e.g., threatened or endangered) wildlife resources.
- Minimize cutbank height and avoid placement of fill on steep slopes.
- Use off-channel water collection features for dust abatement purposes.
- Install adequate number/type of road drainage features to prevent concentration of road runoff.

Analysis of Compliance Measures, Associated Environmental Impacts and Potential Mitigation Measures to Avoid Impacts from Stream Crossing Activities

Discharge of excess sediment and loss of fisheries habitat from undersized, failing or poorly maintained watercourse crossings and crossing approaches is a high priority in the implementation of the Klamath TMDLs due to the high delivery potential associated with failing crossings and the loss of habitat created by human-caused fish migration barriers. As such, additional measures, identified below, likely will be required of all responsible parties in the Klamath River watershed who own or control these features.

Analysis of Compliance Measures to Avoid Impacts Associated with Crossing Activities

- Stabilize/treat crossing approach (road surface draining directly to crossing).
 - Rock road surface,
 - Use water for dust abatement,
 - Install additional road drainage features (e.g., waterbars, rolling dips, cross drains)
- Stabilize/treat crossings and associated fills.
 - Remove undersized/failing culverts
 - Remove unstable fill

- Rock armor, rip rap fill slopes
- Provide “fail safe” road drainage on crossings with diversion potential
- Drain road away from unprotected fills
- Install bioengineered structures (e.g. willow wattles)
- Mulch, vegetate or rock exposed soil with access to watercourses
- Construct storm-proof (or fail-safe) crossings and associated fills.

Potential Environmental Impacts Associated with Crossing Related Compliance Measures

- Excess sediment discharge in violation of prohibition and exceedence of objectives from soil disturbance and earth movement.
- Air quality impacts from heavy equipment use.
- Impacts to cultural sites from equipment use.
- Wildlife species impacts from disturbance to habitat.
- Impacts to sensitive (e.g., threatened or endangered) wildlife resources.
- Creation of migration barriers to aquatic species, including cold water fisheries.
- Decrease in riparian vegetation needed to prevent temperature impacts.

Possible Mitigation Measures Associated with Crossing Related Environmental Impacts

- Avoid construction within wetted channel. Divert stream flow around crossing site, if necessary.
- Install and maintain compliance measures to prevent discharge of excess sediment from soil disturbing activities.
- Consult with Tribes, historical societies, federal, state and local agencies regarding location of cultural resources prior to use of heavy equipment in areas with known or suspected cultural resources.
- Consult with federal, state and local agencies regarding location of sensitive (e.g., threatened or endangered) wildlife resources.
- Time heavy equipment use to occur during period of good air quality (e.g., no air quality impacts from wildland fires).
- Size and construct stream crossing to allow unrestricted passage of aquatic species.
- Re-vegetate disturbed stream banks with native species.

Analysis of Compliance Measures, Potential Environmental Impacts and Possible Mitigation Measures to Avoid Impacts from Road Planning Activities

Good road planning can result in decreased road construction costs, lower maintenance requirements, and greater protection for the environment, including water quality. The compliance measures associated with good road planning are presented below.

Analysis of Compliance Measures to Avoid Road Planning Related Impacts

- Design road to support intended use (e.g., winter use, high traffic, etc.).
 - Surface material (e.g., pavement, chip seal, rock, native material).
 - Road width (e.g., single lane, double lane).
- Design road drainage to prevent road runoff concentration.
 - Drain road away from watercourses.

- Drain road away from unstable areas.
- Install sufficient drainage to prevent erosion at outfall.
- Locate roads on stable ground.
- Minimize crossing number and size of fill, to the extent feasible.
- Design crossing to handle anticipated stream flow and to prevent diversion of stream down the road.
- Avoid sensitive areas (wildlife, cultural).

Potential Environmental Impacts Associated with Road Planning Related Compliance Measures

- Staff has not identified any environmental impact from road planning activities.

Possible Mitigation Measures to Avoid Impacts with Road Planning Related Compliance Measures

- Not applicable.

Analysis of Compliance Measures, Potential Environmental Impacts and Possible Mitigation Measures to Avoid Impacts from Road Decommissioning

Road decommissioning may be a necessary action as part of a responsible party's management program to achieve the applicable TMDL load allocation. Road decommissioning may be appropriate if maintaining the road is cost prohibitive, if the road is not needed for access or public health and safety, or if it is a source of uncontrollable excess sediment discharge.

Analysis of Compliance Measures Associated with Road Decommissioning Activities

- Re-contour road to provide for a stable, hydrologically "invisible" site (e.g., remove perched fill, outslope old road prism, remove crossings).
- Minimize road system (density) to correspond with maintenance resources.
- Decommission roads adjacent to watercourse and relocate to midslope or ridgetop if possible.

Potential Environmental Impacts Associated with Road Decommissioning Compliance Measures

- Excess sediment discharge in violation of prohibition and exceedence of objectives from hillslope, in-channel and stream bank activities.
- Air quality impacts from heavy equipment use.
- Impacts to cultural sites from equipment use.
- Wildlife species impacts from disturbance to habitat.
- Cultural impacts from soil disturbance.
- Decrease in riparian vegetation needed to prevent temperature impacts.

Possible Mitigation Measures to Avoid Impacts from Road Decommissioning Compliance Measures

- See the mitigation measures identified above for road and crossing related activities.

9.5.5.2 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Grazing Activities

The draft Klamath River TMDL recommends adoption of two temperature-related load allocations that are applicable to grazing activities on both federal and non-federal (private) land in the Klamath River watershed. One is a load allocation for excess solar radiation (expressed as its inverse, shade) and the other is related to sediment discharge related to human activity. See the discussion above in Sections 9.5.5.1 for more on these allocations and targets.

The draft Klamath River TMDL recommends adoption of one load allocation relative to nutrients/organic matter and two nutrient-related numeric targets. See Table 5.18 and 5.19 in Chapter 5 of this Staff Report for more information on load allocations and numeric targets. The load allocation and targets are designed to achieve the proposed revised DO objective. As such, the compliance measures discussed here are appropriate for both compliance with the TMDL and with the DO objective.

The load allocation is expressed as “*TN, TP, and CBOD concentrations expressed as monthly mean concentrations*”.

The nutrient-related numeric targets include:

- Expressed as monthly mean concentrations of TP, TN, and CBOD below the Salmon River (Table 5.17 in the Staff Report).
- Reach-averaged maximum density of 150 mg of chlorophyll-a /m² below the Salmon River.

For the purpose of this analysis a discussion of environmental impacts associated with irrigated agricultural is presented separately below in Section 9.5.5.3.

Grazing on federal land is regulated primarily by the USFS under Rangeland Project Decision documents and Annual Operating Instructions designed to meet the “*Northwest Forest Plan*” objectives for individual public forests. In addition, through the execution of a formal Management Agency Agreement with the USFS in 1981, the State Water Board designated the USFS as the Water Quality Management Agency for National Forest System lands in California. A document entitled “*Water Quality Management for Forest System Lands in California: Best Management Practices*” (USDA 2000) describes the means by which the USFS endeavors to meet their responsibility with respect to water quality protection.

Grazing on non-federal lands in the Klamath River Basin goes largely unregulated, except in the Scott and Shasta River watersheds (as a result of ongoing implementation of the approved Scott and Shasta River TMDLs and on concentrated animal feeding operations (CAFOs)). TMDL implementation plans adopted by the Regional Water Board in the Scott and Shasta River watersheds provide a waiver of WDRs for activities, including grazing, that implement measures contained in the applicable plan. NDPES permits are issued to CAFOs.

In the Klamath River TMDL, staff proposes the development of a conditional waiver of WDRs for discharges associated with agricultural activities that will include grazing as a means of implementing the TMDL and water quality standards. The Regional Water Board does not typically specify those measures necessary to achieve compliance with WDRs. Instead, the Regional Water Board typically allows land owners/managers to apply their own expertise and ingenuity to determine the best means of compliance. With respect to the TMDL, the waiver will be designed to implement the watershed-wide allocations, and the numeric nutrient and organic matter allocations.

For the purpose of CEQA, Regional Board staff must identify the reasonably foreseeable compliance measures that could be employed to achieve compliance with the TMDL and analyze their potential to cause environmental impact. With respect to the field of grazing on non-federal land, staff has used USEPA's (2003) *National Management Measures to Control Nonpoint Pollution from Agriculture* for guidance on the compliance measures that could be implemented to comply with a grazing waiver or WDR.

Four separate areas of management necessary to reduce the environmental harm resulting from grazing activities are described below. They include:

- A. Grazing Management Practices
- B. Alternative Water Supply Practices
- C. Riparian Grazing Practices
- D. Monitoring Grazing Land Condition

Grazing management practices are well suited to address the sediment-related temperature allocations proposed under the Klamath TMDL. Alternative water supply practices are well suited to address both the sediment-related temperature allocations and the nutrient and organic matter allocations. The riparian grazing practices are well suited to address the riparian shade allocation. The land and stream bank stabilization practices are also well suited to address the sediment-related temperature allocation. Monitoring is an activity necessary to ensure that the predicted effects are in fact occurring.

Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Grazing Management Practices

USEPA (2003) states that appropriate grazing management systems ensure proper grazing use by adjusting grazing intensity and duration to reflect the availability of forage and feed designated for livestock uses, and by controlling animal movement through the operating unit of grazing land. The use of grazing management systems can help maintain riparian and other resource objectives and can help meet the specific management objectives of the desired quality, quantity, and age distribution of vegetation.

Analysis of Compliance Measures Associated with Grazing Management Practices

- Develop a grazing management plan for upland and riparian management.

- Calculate the number of livestock that can be maintained while maintaining adequate vegetative cover, stream corridor integrity, and water resources.
- Establish native or introduced forage species (grasses, forbs, legumes, shrubs, and trees) through pasture, hay field and rangeland planting.
- Implement the controlled harvest of vegetation with grazing or browsing animals to achieve a specific objective.
- Exclude animals, people, or vehicles from an area to protect, maintain, or improve the quantity and quality of plant, animal, soil, air, water, and aesthetic resources and human health safety.
- Manage the amount, source, placement, form and timing of the application of nutrients and soil amendment through nutrient management.

Potential Environmental Impacts Associated with Grazing Management Compliance Measures

- Introduction of invasive (introduced) species thorough pasture, hay and rangeland planting and management.
- Decrease standing cover crop from removal of forage.
- Increase risk of soil compaction from heavy equipment use.
- Risk of increase soil erosion from fence installation.
- Risk of disturbing cultural/archaeological resources from fence installation
- Risk of disturbing threatened or endangered species or their habitat from installation of fencing.

Possible Mitigation Measures to Avoid Impacts from Grazing Management Practices

- Use certified weed-free grass and seed mix to prevent the introduction of invasive species.
- Manage livestock numbers and grazing patterns to retain adequate standing or cover crop,
- Limit the use of heavy equipment for grazing management activities to dry conditions.
- Consult with Tribes, historical societies, federal, state and local agencies regarding location of cultural resources prior to use of heavy equipment in areas with known or suspected cultural resources.
- Consult with federal, state and local agencies regarding location of sensitive (e.g. threatened or endangered) wildlife resources.
- Plant a cover crop on exposed soil to reduce the length of time in which soil is exposed to wind and water.
- Cover exposed soil that will not receive immediate planting with straw or other suitable erosion control material; and
- Protect drainage channels from sediment contributions with vegetated buffers, wattles or similar erosion control devices.

Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Alternative Water Supply Practices

USEPA (2003) states that providing water and mineral supplement facilities away from streams will help keep livestock away from stream banks and riparian zones, thereby

protecting water quality. In some locations, artificial shade may also be constructed to encourage use of upland sites for shading and loafing, rather than the stream corridor. Installing alternate water supplies for livestock is an essential component of this measure.

Analysis of Compliance Measures Associated with Alternative Water Supply Practices

- Install a pipeline to convey livestock water to an off-stream pond, trough or tank.
- Construct/improve system (well, pump, etc) to provide groundwater for irrigation, livestock, wildlife, or recreation in lieu of instream withdraws.
- Improve springs and seeps by excavating, cleaning, capping, or providing collection and storage facilities. To facilitate off-stream watering.
- Place water, shade, and mineral supplements in locations separate from one another to encourage livestock dispersal.
- Ensure water, shade and mineral supplements are not placed on unstable areas, including gullies and landslides.

Potential Environmental Impacts Associated with Alternative Water Supply Practices

- Increased risk of short-term erosion impacts from construction activities.
- Increased risk of disturbing archaeological or cultural artifacts.
- Increased risk of disturbing threatened or endangered species and their habitat.
- Increased risk of soil disturbance that comes from the concentration of animals in a limited area.

Possible Mitigation Measures for Alternative Water Supply Practices

- Exercise surface erosion control measures, such as laying out straw or downslope wattles, where necessary.
- Restricting work to days in which soil detachment by wind or water is not expected.
- Timing the completion of work to coincide with planting to reduce the length of time in which bare soil is exposed.
- Covering exposed soil that will not receive immediate planting with straw or other suitable erosion control material.

Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Riparian Grazing Practices

The TMDL implementation plan includes an allocation intended to protect riparian vegetation from disturbance and preserve shade potential along the stream corridor. As such, any grazing in the riparian zone where this allocation applies must be conducted within certain parameters designed to protect the shade potential. Protection of specific trees, groves, or a streamside buffer zone may be necessary to accomplish this goal. The identification of the shade producing elements within the riparian zone will be necessary.

Analysis of Compliance Measures Associated with Riparian Grazing Practices

- Minimize livestock access to riparian zones, ponds or lake shores, wetlands, and stream banks to protect these areas from physical disturbance.
- Construct animal trails to provide movement of livestock through difficult or ecologically sensitive terrain.

- Stabilize stream crossings to provide controlled access across a stream for livestock and farm machinery.

Potential Environmental Impacts Associated with Riparian Grazing Practices

- See impacts identified above for grazing management in general.
- An analysis of the environmental impacts of stream crossings is provided in the section on roads and crossings.

Possible Mitigation Measures to Avoid Impacts from Riparian Grazing Practices

- See mitigation measures identified above for grazing management in general.
- See mitigation measures identified above for crossing management in general.

Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Monitoring Grazing Land Condition

The grazing management strategy as described by USEPA (2003) seeks to protect water quality by encouraging the development of an understanding of the carry capacity of a piece of land and the site specific land management measures necessary for grazing operations to be conducted within the limitations of the carrying capacity. A critical piece of this kind of management is the collection and analysis of environmental data from which to measure the conditions of the land. USEPA (2003) recommends an integrated approach to monitoring to evaluate nutrient cycling, soil and water quality, and plant community dynamics. Monitoring should be conducted on both a site specific level and at the subwatershed level to determine rangeland conditions status and trends. Monitoring can include photo points, vegetation sampling, soil assessments, water quality and quantity analyses and assessments of watershed, riparian and stream conditions.

Analysis of Compliance Measures Associated with Monitoring Condition of Grazing Lands

- None identified.

Potential Environmental Impacts Associated with Monitoring Conditions of Grazing Lands

- Not applicable.

Possible Mitigation Measures to Avoid Impacts from Monitoring Condition of Grazing Lands

- Not applicable.

9.5.5.3 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Irrigated Agriculture

Irrigated agriculture is identified in the Klamath River TMDL as a category of anthropogenic pollutant loads (source category) impacting water quality parameters of concern. The draft TMDL Implementation Plan identifies the development of a general conditional waiver of WDRs for the purpose of controlling discharges associated with agricultural activities that includes irrigated agriculture.

Staff has turned to USEPA's (2003) *National Management Measures to Control Nonpoint Pollution from Agriculture* for guidance on the compliance measures that reasonably could be implemented to comply with the Klamath River TMDL. USEPA (2003) identifies four categories of management measures responsible parties should consider when attempting to reduce nonpoint source pollution from their farms. These measures include:

- Nutrient management
- Pesticide management
- Erosion and sediment control
- Irrigation water management

Staff judges each of these areas of management to be relevant to implementing the Klamath River TMDLs for temperature, dissolved oxygen, organic matter, nutrients and microcystin-related load allocations and numeric targets, as well as the proposed revised DO objectives. In addition, staff encourages riparian management to achieve the temperature-excess sediment TMDL allocation.

Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures from Nutrient Management Practices

The goal of proper nutrient management is "to minimize nutrient losses from agricultural lands occurring by edge-of-field runoff and by leaching from the root zone" (USEPA 2003). USEPA (2003) describes four important elements to successful nutrient management: 1) determine realistic yield goals, preferably on a field-by-field basis, 2) account for available nutrients from all sources before making supplemental applications, 3) synchronize nutrient applications with crop needs (nitrogen is needed most during active crop growth and may be lost at other times), and 4) reduce excessive soil-phosphorus levels by balancing phosphorus inputs and outputs. Where nutrients are in the dissolved phase, source reduction and reduction of water runoff or leaching are important goals. For nutrients adsorbed to soil particles, the prevention and control of soil erosion is important.

Analysis of Compliance Measures Associated with Nutrient Management

- Monitor soil, irrigation water, and residual plant matter for nutrient content.
- Time fertilizer application to be consistent with plant needs to avoid runoff of excess nutrients to surface waters or leaching of excess nutrients to groundwater.
- Use appropriately sized vegetated buffers to prevent discharge of nutrients to surface waters.

Potential Environmental Impacts Associated with Nutrient Management

- None identified. It is staff's judgment that monitoring, timing, use of cover crops and a vegetated buffer have no reasonable potential to cause environmental harm.

Possible Mitigation Measures to Avoid Impacts from Nutrient Management Practices

- Not applicable.

Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures from Pesticide Management

The goal of proper pesticide management is to reduce contamination of ground and surface water from pesticides by using less pesticide (quantity), less toxic (toxicity) pesticides, and applying pesticides in a manner that reduces the risk of runoff, leaching or air-borne transport.. With respect to the Klamath River TMDL, the application of herbicides is of most relevance. For example, herbicides applied to drainage channels or applied in such a manner as to risk overspray to a water body or riparian zone, could result in an increased risk of organic matter loading as treated plants die and their organic matter is available for delivery to a stream. Similarly, the spraying of herbicides in a riparian zone or overspray from adjacent fields could result in the temporary loss or harm to riparian shade.

Analysis of Compliance Measures Associated with Pesticide Management

- Inventory pest problems.
- Evaluate the soil and physical characteristics of the site, including locations for safe mixing, loading, and storage of pesticides.
- Use integrated pest management strategies that apply pesticides only to the area of need, only when there is an economic benefit to the grower, and at times when runoff losses are least likely, including losses of organic matter from dead plant material.
- Consider the persistence, toxicity, runoff potential, and leaching potential of pesticide products.
- Periodically calibrate pesticide application equipment.
- Use anti-backflow devices on water supply hoses, and other mixing/loading practices designed to reduced the risk of runoff and spills.

Potential Environmental Impacts Associated with Implementation of Compliance Measures for Pesticide Management

- None identified. It is staff's judgment that none of the identified compliance measures have a reasonable potential to cause environmental harm.

Possible Mitigation Measures to Avoid Impacts Associated with Implementation of Compliance Measures for Pesticide Management

- Not applicable.

Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures from Erosion and Sediment Control Measures

USEPA (2003) describes two general strategies for controlling erosion and the deposition of sediment to waters of the State from irrigated agricultural operations. These strategies can be used singly or in combination. The first, and most desirable, is "to implement practices on the field to minimize soil detachment, erosion, and transport of sediment from the field" (USEPA 2003).

Analysis of Compliance Measures Associated with Erosion and Sediment Control Practices

- Maintain crop residue or vegetative cover on the soil.
- Improve soil properties by tilling or otherwise loosening the soil.
- Reduce field slope length, steepness, or unsheltered distance.
- Reduce effective water velocities.
- Reduce effective wind velocities by installing windbreaks (e.g. trees).
- Direct field runoff to areas that filter, trap, or settle soil particles.

Potential Environmental Impacts Associated with Implementation of Compliance Measures for Erosion and Sediment Control

- Short term increases in sediment discharge from wind and water erosion from soil disturbance activities.
- Short term increases in sediment discharge from heavy equipment use.
- Increased short-term risk of soil erosion from re-contouring of fields.
- Air quality impacts from use of heavy equipment
- The construction of measures designed to filter, trap or settle sediment could result in short-term increased risk of erosion.
- Impacts to cultural resources from heavy equipment use.
- Impacts to threatened or endangered species or their habitat from heavy equipment use.

Possible Mitigation Measures to Avoid Impacts Associated with Implementation of Compliance Measures for Erosion and Sediment Control

- Avoid soil disturbing activities on windy and wet days.
- Design measures to filter, trap or settle sediment particles (sediment and/or water basins, field borders, and filter strips and the protection and management of natural wetland and riparian areas).
- Restrict work to days in which soil detachment by wind or water is not expected.
- Time the completion of work to coincide with planting to reduce the length of time in which bare soil is exposed.
- Cover exposed soil that will not receive immediate planting with straw or other suitable erosion control material.
- Protect drainage channels from sediment contributions with vegetated buffers, wattles or similar erosion control devices.

9.5.5.4 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Irrigation Management

According to USEPA (2003), “a primary concern for irrigation water management is the discharge of salts, pesticides, and nutrients to ground water and discharge of these pollutants plus sediment to surface water.” The goal of managing irrigation water is to reduce the movement of pollutants from land into ground or surface water as a result of irrigation. This is accomplished by:

1. Irrigation scheduling;
2. Efficient application of irrigation water;

3. Efficient transport of irrigation water;
4. Use of runoff or tailwater; and
5. Management of drainage water.

It is staff's judgment that irrigation scheduling involves monitoring and planning and has no environmental impacts. Staff has also concluded that efficient application of irrigation water similarly has no environmental impacts. As such, no further analysis of these two activities will be provided.

Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures Associated with Efficient Transportation of Irrigation Water

The efficient transport of irrigation water could include the construction or modification of a number of engineered features.

Analysis of Compliance Measures Associated with Efficient Transportation of Irrigation Water

- Lining of an irrigation channel.
- Installation of a pipeline in lieu of an uncovered channel.

Potential Environmental Impacts Associated with Compliance Measures for the Efficient Transportation of Irrigation Water

- Use of heavy equipment and soil movement resulting in soil erosion.

Possible Mitigation Measures to Avoid Impacts from Implementation of Compliance Measures for the Efficient Transportation of Irrigation Water

- See discussion on wetland restoration, roads, grazing above for potential mitigation measures to address environmental impacts associated with heavy equipment use.

Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures Associated with Use of Runoff or Tailwater

For irrigation systems that use runoff or tailwater, a tailwater management program could be developed and implemented. This could include the construction of a tailwater recovery system designed to collect, store and transport irrigation tailwater (or runoff) for reuse/use in the irrigation distribution system.

Use of runoff or tailwater may be restricted in some areas, depending on legal issues associated with downstream water rights. But, where it is possible the reuse of tail water as irrigation water can serve to reduce the load of agricultural chemicals and sediment that are ultimately delivered to a stream.

Analysis of Compliance Measures Associated with Use of Runoff or Tailwater

- Operate the irrigation system so that the timing and amount of irrigation water applied matches crop needs.
- Use backflow flow preventers for wells protection.
- Minimize discharge from edge of fields.

- Construct tailwater management system.
 - Construction of a reservoir and pumping facilities.
- Land leveling to prevent discharge from field edges to surface waters.

Potential Environmental Impacts Associated with Compliance Measures for Use of Runoff or Tailwater

- Increased risk of soil or groundwater contamination with concentrated minerals, salts, or persistent pesticides.
- Loss of wetlands habitat from repair of leaky conveyance system.

Possible Mitigation Measures to Avoid Impacts from Installation of Compliance Measures for Use of Runoff or Tailwater

- Use precision (site specific) farming techniques; monitor chemical condition of soil, water, and plant residuals carefully prior to applying fertilizers, pesticides, or water, including tailwater.
- Leach soils within the root zone as necessary to prevent salt build up in that portion of the soil profile. Monitor ground water to ensure no salt (or other constituents) accumulate in ground water.
- Divert “saved” water (or portion thereof) to a wetland or wildlife refuge.
- Avoid introduction of storm water into tailwater system to prevent impacts to storm water.
- Maintain filter strips between fields and surface water to prevent discharge of tailwater directly into surface waters.
- Install surface drainage field ditch to collect excess water.

Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures Associated with the Management of Drainage Water

Drainage from irrigation systems should be managed to reduce deep percolation, move water to reuse system, reduce erosion and help control adverse impacts to surface and ground water.

Analysis of Compliance Measures Associated with the Management of Drainage Water

- Construct vegetated filter strips.
- Construct surface drainage field ditch.

Potential Environmental Impacts Associated with Compliance Measures for the Management of Drainage Water

- Cause a temporary increased risk of soil erosion from soil disturbance.
- Leaching of pesticides, fertilizers, and trace minerals through an under drain system.

Possible Mitigation Measures to Avoid Impacts from Compliance Measures for the Management of Drainage Water

- Don't concentrate drainage such that toxic levels of constituents are discharge to waters.

9.5.5.5 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Timber Harvest Activities on Public and Private Land

Timber harvest and related activities are identified in the Klamath River TMDL as an anthropogenic (human-caused) pollutant source category impacting water quality parameters of concern. The draft Klamath River TMDLs identifies a number of allocation and numeric targets that are applicable to timber harvest activities. See the discussion in Section 9.5.5.1 for a discussion of the sediment-related allocations and targets. The draft TMDL also recommends a temperature-related load allocation for excess solar radiation. This proposed allocation for excess solar radiation is expressed as its inverse “effective shade” and is as follows:

- The shade provide by topography and full potential vegetation conditions at a site, with an allowance for natural disturbance such as floods, wind throw, disease, landslides, and fire.

The draft implementation plan recommends actions for the purpose of controlling water quality impacts emanating from activities associated with timber harvest activities. It is staff’s judgment that these actions are likely necessary to achieve compliance with the Klamath TMDL load allocations and numeric targets.

With respect to timber harvest activities on land managed by the USFS, staff has not identified any additional compliance measures beyond the USFS and the Regional Water Board’s existing regulatory framework. This framework includes, in part, the Regional Water Board conditional waivers (Resolutions R1-2004-0015 and R1-2009-0028), the USFS “*Water Quality Management Plan for the Forest System Lands in California, Best Management Practices*” (USDA, 2000) and the “*Northwest Forest Plan*” and “*Aquatic Conservation Strategy*”. See Chapter 6 of this Staff Report for details on the existing USFS/Regional Water Board regulatory program for timber harvest activities on USFS lands. As such, there is no additional analysis of management measures required under CEQA. Staff is currently working with the USFS to develop a WDR/waiver for the Regional Water Board’s consideration that will potentially cover all their land use activities involving the discharge of nonpoint source of pollution. As envisioned by staff, the proposed permit would include, in part, silvicultural activities, roads construction and maintenance, post fire treatment and a monitoring and reporting program.

The California Forest Practice Rules (2009) describe the intent of the watercourse protection regulations and provides specific measures (narrative or numeric) to ensure adequate protection to the beneficial uses of water from sediment and temperature impacts. As part of the development of the Klamath River TMDL, staff has identified the need to ensure that watercourses that deliver surface (or hyporheic) flows to fish bearing streams have additional requirements in place beyond those required by the 2009 FPR to meet the TMDL temperature load allocation.

Regional Water Board staff identified an implementation action (beyond measures required by other regulatory programs) that likely will be necessary to comply with the TMDL allocations and numeric targets for timber activities on privately owned lands.

See Chapter 6 of this Staff Report for details on the existing CalFire/Regional Water Board regulatory program for timber harvest activities on private land. The compliance measure pertains to the possibility that staff may require additional riparian protections beyond those required by the Anadromous Salmonid Protection Rules (ASP Rules), which take effect on January 1, 2010, in order to meet the Klamath TMDL temperature allocation. Additional riparian protections will be required by Regional Water Board staff on a timber harvest plan-specific basis as part compliance with applicable WDRs and waivers of WDRs for timber harvest activities.

Analysis of Compliance Measures Associated with Timber Harvest Activities on Private Land

- Increased riparian canopy retention for surface waters that support beneficial uses (e.g. Class I¹⁸ and II¹⁹ watercourses) on private timberland.
- Retain in-channel trees following timber operations on private timberlands.

Potential Environmental Impacts Associated with Timber Harvest Activities on Private Land

- Staff has not identified any adverse environmental impacts associate with increasing the post-harvest riparian canopy retention.

Possible Mitigation Measures to Avoid Impacts Associated with Timber Harvest Activities on Private Land

- Not applicable. It is staff's judgment that the retention of additional post-harvest riparian canopy does not have a reasonable potential to cause any environmental harm.

9.5.5.6 Analysis of Compliance Measures, Associated Environmental Impacts, and Potential Mitigation Measures Associated with Fire Management on Federal Lands

The fire regime in the Klamath River basin has been altered through years of suppression that has resulted in increased fuel loads and fire severity. The USFS carries out timber harvest projects related to fire management both to control fuel loads and to salvage timber after a fire.

The practices for controlling post fire erosion sources are, in most cases, the same as those used to control erosion sources on forestlands with the added consideration of increased runoff volume. Regional Water Board staff recommends that the WDRs/waiver address all activities on federal lands including measures that address post fire sediment sources.

Analysis of Compliance Measures Associated with Fire Management on Federal Land

¹⁸ For the purpose of this report, a Class I watercourse is defined as being a "Domestic supplies or having fish always or seasonally present".

¹⁹ For the purpose of this report, a Class II watercourse is defined as "Aquatic habitat for nonfish aquatic species".

- Hydrologically disconnect firelines.
- Remove all temporary crossings.
- Improve the existing road drainage system to handle post-burn flows.
- Clear blockages to restore drainage function.
- Remove minor slumps and slides where needed.
- Ensure the function of drainage systems after storm events.
- Implement post fire re-vegetation on severe burns areas.

Potential Environmental Impacts Associated with Fire Management on Federal Land

- See discussion on potential impacts in the sections on road construction and maintenance and soil and erosion control practices for identification of possible impacts.

Possible Mitigation Measures to Avoid Impacts Associated with Fire Management on Federal Land

- See discussion on mitigation measures in the sections on road construction and maintenance and soil and erosion control practices for identification of potential mitigation measures.

A discussion on the significance (or level) of environmental impact on specific environmental factors such as air, biologic resources, and water quality associated with likely implementation actions are provided in Section 9.7.3 below.

9.5.5.7 Analysis of Compliance Measures, Potential Environmental Impacts, and Possible Mitigation Measures for Thermal Refugia Protection

Suction dredging is identified in the Klamath River TMDL as contributing to impacts on the critical functions associated with thermal refugia in moderating mainstem Klamath River temperatures for salmonids and other species of concern.

No regulatory program is currently in place for permitting instream suction dredging activities. CDFG, required under the Fish and Game Code with developing the program, is currently working on developing CEQA compliant regulation to implement the program.

The proposed implementation plan includes the Thermal Refugia Protection Policy that would be applied in certain locations to all tributary streams in the Klamath River watershed that provide known thermal (cold water) refugia (see Appendix 9 for identified locations of thermal refugia).

The application of the Thermal Refugia Protection Policy will not require implementation of any compliance measures as all responsible parties would be restricted from discharging waste within the prescribed buffer area.

In addition to protecting the quality of cold water by restricting the discharge of waste within an instream buffer zone, staff also proposes the protection of the quantity of cold water delivered by tributaries to the Klamath River mainstem. Staff proposes that the

State Water Resources Control Board ensure that any water rights decisions on refugia tributary streams be made only after an analysis of the individual and cumulative effects of water diversion on tributary and mainstem stream temperatures. Staff proposes that a water right not be granted if the loss of cold water flow would conflict with the temperature goals of the TMDL.

Analysis of Compliance Measures Associated with Thermal Refugia Protection

- None required.

Potential Environmental Impacts Associated with Thermal Refugia Protection

- No environmental impacts identified.

Possible Mitigation Measures Protection of Thermal Refugia

- Not applicable.

9.6 Alternative Means of Compliance

The CEQA requires an analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts²⁰. Responsible parties can use the structural and non-structural BMPs (compliance measures) described above in Section 9.5, or other structural and non-structural BMPs, to control and prevent pollution, and meet the requirements of the proposed Action Plan and revised DO objectives. The alternative means of compliance with the proposed Action Plan and revised DO objectives consist of the different combinations of structural and non-structural BMPs that responsible parties might use. Because there are innumerable ways to combine compliance measures, all of the possible arrangements of alternative means of compliance cannot be discussed here. However, because most of the adverse environmental effects are associated with the construction and installation of large scale structural BMPs to avoid or eliminate impacts, compliance alternatives should minimize structural BMPs, maximize non-structural BMPs, and site, size, and design structural BMPs in ways to minimize environmental effects.

9.7. Environmental Checklist and Discussion of Findings

9.7.1 Environmental Checklist Cover Form

1. Project title:

Proposed Amendment to the *Water Quality Control Plan for the North Coast Region* to Revise the DO objectives for the Klamath River mainstem as contained in Table 3-1 and add a *Klamath River Total Maximum Daily Load Action Plan and Lost River Implementation Plan (Action Plan)*.

²⁰ Cal. Code Regs., tit. 14, § 15187(c)(3).

2. Lead agency name and address:
North Coast Regional Water Quality Control Board
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

3. Contact person and phone number:
Matt St John (707) 576-3762

4. Project location:
The project would be applicable to the California portion of the Klamath River watershed under jurisdiction of the North Coast Regional Water Quality Control.

5. Description of the project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation).

The proposed project is the adoption of a Basin Plan Amendment, which consists of revised DO objectives for the Klamath River as contained in Table 3-1 and a new *Klamath River Total Maximum Daily Load Action Plan and Lost River Implementation Plan*. The proposed revision to the DO objectives involves the elimination of the existing DO objectives for the Klamath River mainstem as contained in Table 3-1 and their replacement with new site-specific DO objectives based on percent saturation, natural receiving water temperatures and salinity. The goal of the revised DO objectives for the Klamath River mainstem is to correct existing inaccuracies and allow for the application of the DO objectives regardless of the time of day.

The Action Plan includes TMDLs for temperature, dissolved oxygen, nutrients and microcystin and the implementation actions necessary to achieve these TMDLs and attain water quality standards in the Klamath River watershed. The goal of the Action Plan is to fully protect and restore the beneficial uses of water in the Klamath River watershed. The Action Plan sets out the pollutant loads and conditions to be considered and incorporated into regulatory and non-regulatory actions in the Klamath River watershed. The Klamath River Action Plan is not directly and independently enforceable, except as incorporated into appropriate permitting or enforcement action or through the applicable of waste discharge prohibitions.

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9.7.2 Environmental Checklist

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS -- Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
II. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
III. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY (cont.)-- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IV. BIOLOGICAL RESOURCES -- Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
V. CULTURAL RESOURCES -- Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS -- Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
VII. HAZARDS AND HAZARDOUS MATERIALS -- Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. HAZARDS AND HAZARDOUS MATERIALS (cont.)-- Would the project:				
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
VIII. HYDROLOGY AND WATER QUALITY -- Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. LAND USE AND PLANNING -- Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
X. MINERAL RESOURCES -- Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
XI. NOISE -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. POPULATION AND HOUSING -- Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
XIII. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
XIV. RECREATION				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. TRANSPORTATION/TRAFFIC -- Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
XVI. UTILITIES AND SERVICE SYSTEMS -- Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

9.7.3 Discussion of Environmental Checklist Findings

As stated previously, the environmental analysis must include an analysis of the reasonably foreseeable environmental impacts of the methods of compliance and the reasonably foreseeable feasible mitigation measures relating to those impacts. This section provides answers to the questions presented in the environmental checklist.

In formulating these answers, the impacts of implementing structural and non-structural BMPs described in Section 9.5 were evaluated. At this time, the exact type, size, and location of BMPs that might be implemented for future proposed projects to comply with the proposed Action Plan and revised DO objectives are unknown. This analysis considered a range of structural and non-structural BMPs that might be used by responsible parties, but is by no means an exhaustive list of available BMPs. Responsible parties will be required to develop and implement site-specific BMPs to control the discharge of waste from their activities.

Potential impacts of the reasonably foreseeable compliance measures were evaluated with respect to earth, air, water, plant life, animal life, noise, light, land use, natural resources, risk of upset, population, housing, transportation, public services, energy, utilities and services systems, human health, aesthetics, recreation, and archeological/historical concerns. Additionally, mandatory findings of significance regarding short-term, long-term, cumulative and substantial impacts were evaluated. Based on this review, staff concluded that any potentially significant impacts can be mitigated to less than significant levels with the exception of several impacts resulting from dam decommissioning activities.

The evaluation considered whether the construction or implementation of the BMPs would cause a substantial, adverse change in any of the physical conditions within the

area affected by the BMP. In addition, the evaluation considered environmental effects in proportion to their severity and probability of occurrence. For the dam decommissioning activities, the environmental analysis was based upon several reports that have analyzed generally the effects of taking out one or more of the dams. Because there is not a proposed project for decommissioning at this time, the evaluation of potential impacts was general in nature and any specific plan for dam removal would require additional analysis.

A significant effect on the environment is defined in statute as “*a substantial, or potentially substantial, adverse change in the environment*” where “*Environment*” is defined by Public Resources Code section 21060.5 as “*the physical conditions which exist within the area which will be affected by a proposed project, including air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance.*”²¹

Social or economic changes related to a physical change of the environment were also considered in determining whether there would be a significant effect on the environment. However, adverse social and economic impacts alone are not significant effects on the environment.

In this analysis, the level of significance was based on baseline or current conditions. Short-term impacts associated with the construction of structural BMPs (with the exception of dam decommissioning activities) were considered less than significant because the impacts due to construction activities are temporary and similar to typical capital improvement projects and maintenance activities currently performed throughout the region. All of the identified impacts are, however, short-term. Until the actual design for dam decommissioning activities is available for review it is impossible to make a determination that all adverse impacts can be mitigated to a less than significant level. Because of this, where it is uncertain whether the potential impacts could be mitigated to levels of insignificance, the Regional Water Board acted conservatively and concluded in this analysis that decommissioning of one or more of the dams would result in a potentially significant impact.

1. Aesthetics: a.) Have a substantial adverse effect on a scenic vista?

Answer: Less than significant.

Discussion: None of the identified compliance measures (e.g. structural and non-structural BMPs) would cause a substantial adverse effect on a scenic vista. None require the permanent construction of a sizable structure that would either block a scenic vista or substantially degrade the vista.

²¹ Pub. Resources Code §21068

1. Aesthetics: b.) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Answer: Less than significant.

Discussion: There are no officially designated state scenic highways in the Klamath River watershed. However, the measures that may be implemented to comply with the Klamath River TMDL and revised DO objectives would not be expected to have an adverse effect on scenic resources.

If a BMP was selected that required land disturbance, such as the construction of a settling basin or a riparian fence, there may be minor surface soil excavation or grading during construction of these structural BMPs, which could result in increased disturbance of the soil. If, however, scenic resources were identified at the site, they would be avoided, and standard construction techniques should not result in damage to scenic resources.

1. Aesthetics: c.) Substantially degrade the existing visual character or quality of the site and its surroundings?

Answer: Less than significant with mitigation.

Discussion: Neither the structural nor the non-structural BMPs that would potentially be used to comply with the requirements of the proposed Action Plan and revised DO objectives would be expected to degrade the existing visual character or quality of a site and its surroundings with the application of appropriate mitigation measures.

Although implementation of structural BMPs could result in some change in visual character or ground surface relief features, most of the compliance measures identified as part of the environmental analysis are of relatively small scale, such as installation of road drainage features, riparian fencing, or tailwater retention systems, that changes to the visual character or quality of the site and its surroundings will not be noticeable. The larger scale projects, such as dam decommissioning, road decommissioning on USFS land, construction of treatment wetlands, or construction of a conventional wastewater treatment facility, will require a project-level analysis of potential environmental effects, including effects on aesthetic resources. Visual impacts associated with dam decommissioning can be addressed through the decommissioning plan by including mitigation measures such as early establishment of native vegetation (grass, forbes and trees) on exposed surfaces.

1. Aesthetics: d.) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Answer: Less than significant.

Discussion: Neither the structural nor the non-structural compliance measures that would potentially be used to comply with the requirements of the proposed Action Plan and revised DO objectives would be expected to create a new source of substantial lighting or glare.

2. Agriculture Resources: a.) In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:

Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

Answer: Less than significant.

Discussion: Staff judges that there may be incidental loss of agricultural use in lands mapped as Prime Farmland, Unique Farmland or Farmland of Statewide Importance. These losses, however, would be less than significant because not only do they affect a very narrow band of land on either side of the watercourse. But, as derived from the readily accessible information from the Farmland Mapping and Monitoring Program, no more than 5% of the Klamath River basin is mapped as Prime Farmland, Unique Farmland, and Farmland of Statewide Importance.

2. Agriculture Resources: b.) In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:

Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Answer: Less than significant.

Discussion: Neither the structural nor the non-structural BMPs that would potentially be used to comply with the requirements of the proposed Action Plan and revised DO objectives would be expected to conflict with existing zoning for agricultural use, or a Williamson Act contract.

2. Agriculture Resources: c.) In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:

Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?

Answer: Less than significant.

Discussion: Neither the structural nor the non-structural BMPs that would potentially be used to comply with the requirements of the proposed Action Plan or revised DO objectives would be expected to result in changes to the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use. The three KHP dams located in California were built as part of a hydroelectric system and not as part of irrigation deliver system. As such, even in the event of dam decommissioning, no impacts are expected to arise that would result in the conversion of Farmland to non-agricultural use.

3. Air Quality: a.) Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

Conflict with or obstruct implementation of the applicable air quality plan?

Answer: Less than significant.

Discussion: Neither the structural nor the non-structural BMPs that would potentially be used to comply with the requirements of the proposed Action Plan and revised DO objectives would be expected to result in any conflicts with or obstruction to the implementation of the applicable air quality plan.

Implementation of structural BMPs that require the use of heavy equipment, such as the dam decommissioning, construction of settling basins, road drainage installation or re-contouring of existing road prisms, could result in vehicle emissions during construction; however, these impacts would be short-term, and would not result in conflicts with, or obstruction of the implementation of the applicable air quality plan.

3. Air Quality: b.) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Answer: Less than significant with mitigation.

Discussion: Neither the structural nor the non-structural BMPs that would potentially be used to comply with the requirements of the proposed Action Plan and revised DO objectives would be expected to result in any violation of air quality standards or contribute substantially to an existing or projected air quality violation if appropriate mitigation measures are applied.

The implementation of structural BMPs in order to comply with the requirements of the Action Plan and revised DO objectives could result in the generation of fugitive dust and particulate matter during construction or maintenance activities, which could temporarily impact ambient air quality. Any such impacts would be temporary, and would be controlled with standard construction operations, such as the use of moisture to reduce the transfer of particulates and dust to air and conducting operations when the air quality in the basin is good (i.e. no catastrophic wildfires). The emission of air pollutants during short-term construction activities associated with reasonably foreseeable methods of compliance would not likely change ambient air conditions, because long-term ambient air quality would not change after short-term construction activities are completed.

3. Air Quality: c.) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Answer: Less than significant with mitigation.

Discussion: Neither the structural nor the non-structural BMPs that would potentially be used to comply with the requirements of the proposed Action Plan and revised DO objectives will result in a cumulatively considerable net increase of any criteria pollutant for which the region is non-attainment under an applicable federal or state ambient air quality standard.

The implementation of BMPs that could result in fine particulate matter and vehicle emissions, such as the BMPs associated with earth movement and dam decommissioning, could contribute to the problems with these pollutants. However, any contribution would be very small, given both the temporary nature of any such impacts and the fairly small nature of any such construction activity given the size of the basin.

3. Air Quality: d.) Expose sensitive receptors to substantial pollutant concentrations?

Answer: Less than significant.

Discussion: Neither the structural nor the non-structural BMPs that would potentially be used to comply with the requirements of the proposed Action Plan and revised DO objectives would be expected to expose sensitive receptors to substantial pollutant

concentrations. The primary BMPs expected to be implemented would be to control discharge of earthen and organic matter and are not related to conventional pollutants.

3. Air Quality: e.) Create objectionable odors affecting a substantial number of people?

Answer: Less than significant with mitigation.

Discussion: The majority of the structural and non-structural BMPs that would potentially be used to comply with the requirements of the proposed Action Plan and revised DO objectives would not be expected to result in objectionable odors affecting a substantial number of people.

Construction and installation of structural BMPs may result in objectionable odors in the short-term due to exhaust from construction equipment and vehicles, but no more so than during typical construction and maintenance activities currently performed throughout the region. However, certain structural BMPs, such as settling basins and filtration basins, could become a source of objectionable odors if the BMP designs allow for water stagnation or collection of water with sulfur-containing compounds. This could also be the case if anaerobic sediment is exposed to the air as a result of dam removal operations. The application of mitigation measures designed to offset the number of people impacted will likely decrease this to a less than significant effect. Any odors would be very short-lived. Dischargers will be required to monitor the implementation of BMPs to ensure they are working correctly. If a discharger found that odors were occurring from implementation of a settling or filtration basin, measures, such as proper BMP design to eliminate standing water, covers, aeration, filters, barriers, and/or odor suppressing chemical additives, would be required if the odors were becoming a nuisance to the community. The Regional Water Board will require structural BMPs that could result in stagnant water to be inspected regularly to ensure that treatment devices are not clogged, pooling water, odorous, or mosquito vectors.

4. Biological Resources: a.) Would the project:

Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or U.S. Fish and Wildlife Service (USFWS)?

Answer: Potentially significant impact.

Discussion: The measures that may be implemented to comply with the proposed Action Plan and revised DO objectives may have a potential impact upon species identified as a candidate, sensitive, or special status species in local or regional plan, policies or regulations or by the CDFG or USFWS if they occur in an area where such species are located.

Non-structural BMPs will not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

BMPs that may not have an impact when implemented in one area could potentially have an impact if they are implemented in a sensitive area. Therefore, when installing structural BMPs that involve substantial earth moving, responsible parties will be required under their applicable permit to consult with federal, state and local agencies, including but not limited to the county the project is located in, CDFG and the USFWS, and implement mitigation identified by the agencies to avoid impacts to rare, threatened or endangered species. If no such mitigation is available, the activity would not be permitted without additional review and findings. For example, the Regional Water Board is considering the development of a Basin Plan amendment to provide “Exception Criteria for Restoration Projects” as part of the 2007-2010 Triennial Review process to establish procedures for approving projects that have potentially significant short-term water quality impacts if certain findings can be made after site –specific environmental analysis. USFS and the TRRP both provided comments in support of the development of this amendment during the Triennial Review hearing. In most cases the installation of structural BMPs would be of relatively small scale and any impacts could be avoided by adjusting the timing and/or location of the BMPs to take into account candidate, sensitive, or special status species or their habitats.

Because of these mitigation requirements, substantial adverse effects either directly or through habitat modifications, on any species identified as a candidate, sensitive or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS are not expected to occur.

4. Biological Resources: b.) Would the project:

Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?

Answer: Less than significant with mitigation.

Discussion: Substantial adverse effects on any riparian habitat or other sensitive natural community are not expected because the proposed Action Plan requires protection of riparian areas through the application of a temperature-related load allocation for solar radiation (expressed as its inverse shade).

According to one of the dam decommissioning studies approximately 480 acres of riparian area surrounding the three reservoirs could be lost through dam removal. If wetland construction, watershed-wide riparian protection and replanting, and re-vegetation of the exposed reservoir surfaces are applied as mitigation measures the impact from the loss of riparian habit from these sites will likely be less than significant.

The actual impacts associated with this activity would need to be fully evaluated under a federal and/or state environmental impact analysis before decommissioning could occur.

None of the proposed non-structural BMPs would have the potential to adversely affect any riparian habitat or other sensitive natural community of plants identified in local or regional plans, policies, regulations, or by the CDFG or USFWS.

BMPs that may not have an impact when implemented in one area could potentially have an impact if they are implemented in a sensitive area. Therefore, when installing structural BMPs that may include substantial earth moving or other alteration to riparian habitat, responsible parties will be required under their applicable permit, to avoid riparian habitat or other sensitive natural communities.

Because of these mitigation requirements, substantial adverse effects either directly or through habitat modifications, on any species identified as a candidate, sensitive or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service are not expected to occur.

4. Biological Resources: c.) Would the project:

Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Answer: Less than significant with mitigation.

Discussion: The application of compliance measures in federally protected wetland areas would not be allowed if doing so would affect the beneficial uses associated with that wetland. All activities in federally protected wetlands, except those statutory exemption like agricultural, require the responsible party to obtain a Clean Water Act 404 permit. The federal permit must include compliance measures that ensure that all water quality objectives for the wetland are protected. Implementation of most BMPs would not be allowed within a wetland because doing so would interfere with the protection of the beneficial uses of that wetland. For example, any BMP that required construction, such as a filtration or siltation basin, would not be allowed in the wetland because it would interfere with the beneficial uses of the wetland.

4. Biological Resources: d.) Would the project:

Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Answer: Less than significant with mitigation.

Discussion: The Klamath River and its tributaries provides habitat, including the migration, for both native resident and migratory fish. Most of the reasonably foreseeable compliance measures identified as part of this environmental analysis will likely not interfere with the movement of these species. However, although dam removal would ultimately result in greater movement for spawning fish, significant adverse effects on fish movement could occur at least temporarily unless appropriate mitigation is implemented to limit the duration of increased turbidity associated with dam removal and the decommissioning activities are timed to protect the most sensitive species/life stages.

A migratory corridor is generally described as a landscape feature (such as a ridgeline, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources such as water, food, or den sites. Wildlife corridors are generally an area of habitat, usually linear in nature, which connect two or more habitat patches that would otherwise be fragmented or isolated from one another. It is unlikely that construction of structural BMPs for compliance with the proposed Action Plan and revised DO objectives would restrict wildlife movement because the sizes of the compliance measures are generally too small to obstruct a corridor.

However, if a responsible party will be conducting substantial earth movement to implement BMPs, they are encouraged to consult with various Federal, State and local agencies, including but not limited to the CDFG and the USFWS to confirm that the BMPs would not substantially interfere with movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors and native wildlife nursery. If there was the potential for an adverse impact to wildlife migration and/or use of a native wildlife nursery, the timing of the discharge or the location of the BMP would have to be changed to avoid the impact. None of the structural BMPs would, therefore, result in direct or reasonably foreseeable indirect impacts to fish and wildlife movement, migration or use of a native wildlife nursery site.

None of the non-structural BMPs that are reasonably foreseeable means of compliance with the Basin Plan Amendments will result in a barrier to the migration or movement of aquatic or wildlife species.

4. Biological Resources: e.) Would the project:

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Answer: Less than significant with mitigation.

Discussion: The reasonably foreseeable compliance measures that would be implemented to comply with the proposed Action Plan and revised DO objectives are not

expected to conflict with ordinances protecting biological resources, such as a tree preservation policy.

4. Biological Resources: f.) Would the project:

Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Answer: Less than significant.

Discussion: It is unlikely that the implementation of compliance measures as recommended under the proposed implementation plan and as necessary to comply with the revised DO objectives would conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan. More likely the compliance measures would be similar to measures already committed to under other plans. Such similarities are likely to ensure that compliance measures are in alignment with any adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan.

5. Cultural Resources: a.) Would the project:

Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5

Answer: Less than significant with mitigation.

Discussion: The implementation of compliance measures as recommended under the proposed implementation plan and as necessary to comply with the TMDL load allocations and revised DO objectives would not result in the alteration of a significant historical resource. Non-structural BMPs will not result in the alteration of a significant historical resource because none of the non-structural BMPs would involve any physical effects.

Similarly, it is unlikely that implementation of any structural BMP would result in a substantial adverse change in the significance of a historical resource. However, in cases where the installation of structural BMPs may involve large scale excavation activities or the construction of a large scale infrastructure, a cultural resources investigation should be conducted before any substantial disturbance of land that has not been disturbed previously. The cultural resources investigation will include, at a minimum, a records search for previously identified cultural resources and previously conducted cultural resources investigations of the project parcel and vicinity.

5. Cultural Resources: b.) Would the project:

Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

Answer: Less than significant with mitigation.

Discussion: It is unlikely that the implementation of compliance measures as recommended under the proposed implementation plan and as necessary to comply with the TMDL load allocations and revised DO objectives would cause a substantial adverse change in the significance of an archaeological resource pursuant to section 15064.5. Non-structural BMPs will not cause a substantial adverse change in the significance of an archaeological resource pursuant to section 15064.5.

Similarly, it is unlikely that implementation of any structural BMP would cause a substantial adverse change in the significance of an archaeological resource pursuant to section 15064.5. However, in cases where the installation of structural BMPs may involve excavation activities (such as dam decommissioning), a cultural resources investigation should be conducted before any substantial disturbance of land that has not been disturbed previously. The cultural resources investigation should include, at a minimum, a records search for previously identified cultural resources and previously conducted cultural resources investigations of the project parcel and vicinity. This record search should also include, at a minimum, contacting the appropriate information center of the California Historical Resources Information System, operated under the auspices of the California Office of Historic Preservation. In coordination with the information center or a qualified archaeologist, a determination regarding whether previously identified cultural resources will be affected by the proposed project must be made and if previously conducted investigations were performed to satisfy the requirements of CEQA. If not, a cultural resources survey would need to be conducted. The purpose of this investigation would be to identify resources before they are affected by a proposed project and avoid the impact. If the impact is unavoidable, mitigation will be determined on a case-by-case basis, as warranted.

5. Cultural Resources: c.) Would the project:

Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Answer: Less than significant.

Discussion: The implementation of compliance measures as recommended under the proposed implementation plan and as necessary to comply with the TMDL load allocations and revised DO objectives would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Non-structural BMPs will not result in the direct or indirect destruction of a unique paleontological resource or site or unique geologic feature.

Similarly, it is unlikely that implementation of any structural BMP would result in the destruction of a unique paleontological resource or site or unique geologic feature. However, in cases where the installation of structural BMPs may involve excavation activities, an investigation of paleontological resources would need to be conducted by a trained professional before any substantial disturbance of land that has not been disturbed previously.

5. Cultural Resources: d.) Would the project:

Disturb any human remains, including those interred outside of formal cemeteries?

Answer: Less than significant.

Discussion: It is staff's judgment the selection and implementation of appropriately designed measures to comply with the proposed Action Plan and revised DO objectives will not directly or indirectly result in the disturbance of any human remains, including those interred outside of formal cemeteries.

Similarly, it is unlikely that implementation of any structural BMP would cause a substantial adverse change in the significance of an archaeological resource pursuant to section 15064.5. However, in cases where the installation of structural BMPs or dam decommissioning may involve excavation activities, a cultural resources investigation should be conducted before any substantial disturbance of land that has not been disturbed previously. The cultural resources investigation should include, at a minimum, a records search for previously identified cultural resources and previously conducted cultural resources investigations of the project parcel and vicinity. This record search should also include, at a minimum, contacting the appropriate information center of the California Historical Resources Information System, operated under the auspices of the California Office of Historic Preservation. In coordination with the information center or a qualified archaeologist, a determination regarding whether previously identified cultural resources will be affected by the proposed project must be made and if previously conducted investigations were performed to satisfy the requirements of CEQA. If not, a cultural resources survey would need to be conducted. The purpose of this investigation would be to identify resources before they are affected by a proposed project and avoid the impact. If the impact is unavoidable, mitigation will be determined on a case-by-case basis, as warranted.

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6. Geology and Soils: a.)(i) Would the project:

Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Answer: No impact.

Discussion: Implementation of compliance measures as recommended under the proposed implementation plan and as necessary to comply with the TMDL load allocations and revised DO objectives would not result in exposing people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault as there will be no means of compliance involving moving permanent structures or people onto an earthquake fault.

6. Geology and Soils: a.)(ii) Would the project:

Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking?

Answer: No impact.

Discussion: Implementation of compliance measures as recommended under the proposed implementation plan and as necessary to comply with the TMDL load allocations and revised DO objectives would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking as there will be no implementation of compliance measures involving moving permanent structures or people onto an earthquake fault.

6. Geology and Soils: a.)(iii) Would the project:

Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving seismic-related ground failure, including liquefaction.

Answer: No impact.

Discussion: Implementation of compliance measures as recommended under the proposed implementation plan and as necessary to comply with the TMDL load allocations and revised DO objectives would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving seismic-

related ground failure, including liquefaction as none of the reasonably foreseeable compliance measures involves moving permanent structures or people into an area potential susceptible to liquefaction.

6. Geology and Soils: a.)(iv) Would the project:

Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving landslides?

Answer: Less than significant with mitigation.

Discussion: Implementation of compliance measures as recommended under the proposed implementation plan and as necessary to comply with the TMDL load allocations and revised DO objectives would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving landslides as none of the reasonably foreseeable compliance measures involves moving permanent structures or people into an area potentially subject to landslides.

6. Geology and Soils: b.) Would the project:

Result in substantial soil erosion or the loss of topsoil?

Answer: Less than significant with mitigation.

Discussion: Implementation of compliance measures as recommended under the proposed implementation plan and as necessary to comply with the TMDL load allocations and revised DO objectives may result in minor, temporary soil excavation or disturbance during implementation of compliance measures that involve construction of structural BMPs such as road drainage installation, field leveling for irrigation management or installation of off channel stock watering ponds. However, construction related erosion impacts will cease with the cessation of construction activity. Appropriate selection, implementation and maintenance of mitigation measures to prevent concentration of water and exposure of disturbed (unprotected) soil to rainfall and winds will result in less than significant loss of top soil or substantial soil erosion.

6. Geology and Soils: c.) Would the project:

Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Answer: Less than significant with mitigation.

Discussion: Most structural BMPs that were recommended under the proposed implementation plan and as necessary to comply with the TMDL load allocations and revised DO objectives would not have any significant adverse effect if located on

unstable soil, nor would they cause soil to become unstable. The road related compliance measures encourage locating roads on stable terrain and preventing the placement of road material on unstable slopes that could cause a landslide or other type of mass wasting event.

6. Geology and Soils: d.) Would the project:

Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Answer: No impact.

Discussion: Even if structural BMPs that were recommended under the proposed implementation plan as necessary to comply with the TMDL load allocations and revised DO objectives were located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), they would not create substantial risks to life or property. The structural BMPs that have been identified as the foreseeable means of compliance do not involve moving permanent structures or people into a new area, and so there would be no risk to life or property created.

6. Geology and Soils: e.) Would the project:

Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Answer: Less than significant.

Discussion: There is no data to date that indicates that septic tanks are contributing to the impairment of the Klamath River due to soil conditions. It is staff's judgment that the proposed Action Plan (and the identified compliance measures) will not result in significant impacts from septic tanks or alternative waste water disposal systems.

7. Hazards and Hazardous Materials: a.) Would the project:

Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Answer: Less than significant.

Discussion: It is staff's judgment that none of the identified compliance measures would create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials. There is the possibility that hazardous materials (e.g., oil, gasoline) may be transported to a site and be present during compliance measure construction and installation activities. Any potential risks of exposure would be small, especially with proper handling and storage procedures. All risks of exposure

would be short term and would be eliminated with the completion of compliance measure construction and installation activities.

7. Hazards and Hazardous Materials: b.) Would the project:

Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Answer: Less than significant with mitigation.

Discussion: The implementation of non-structural BMPs to comply with the requirements of the proposed Action Plan and revised DO objectives would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

The structural compliance measures that may be used to comply with the requirements of the proposed Action Plan, with the exception of dam decommissioning, would not be subject to explosion or the release of hazardous substances in the event of an accident because these types of substances would not be present. Again, there is the possibility that hazardous materials (e.g., oil, gasoline) may be present during construction and installation activities, but potential risks of exposure would be small, especially with proper handling and storage procedures. All risks of exposure would be short term and would be eliminated with the completion of construction and installation activities.

The dam decommissioning studies evaluated to develop this environmental analysis were all premised on the use of blasting (explosives) to remove the concrete dam and related structures. Any blasting activities would need to be conducted by a licensed professional and mitigation measures clearly described in the dam decommissioning plan, including a transportation plan for the explosive materials. At a minimum these measures should include, all non-essential workers being prohibited from entering the site and stationed downwind at a safe distance away from blasting operations.

The presence of hazardous materials stored in the sediments trapped behind the reservoirs would need to be thoroughly analyzed prior to any dam decommissioning that proposed the release of sediment and associated waste into the Klamath River. The dam decommissioning plan would need to include a proposal to allow for the characterization of the in-reservoir sediment to ensure that any material identified as hazardous is not released into the environment.

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7. Hazards and Hazardous Materials: c.) Would the project:

Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Answer: Less than significant.

Discussion: The implementation of non-structural and structural BMPs that would potentially be used to comply with the requirements of the proposed Action Plan and revised DO objectives would not reasonably emit hazardous emissions or result in the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. Again, there is the possibility that hazardous materials (e.g., oil, gasoline) may be present during construction and installation activities, but potential risks of exposure would be small, especially with proper handling and storage procedures. All risks of exposure would be short term and would be eliminated with the completion of construction and installation activities.

7. Hazards and Hazardous Materials: d.) Would the project:

Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Answer: Less than significant.

Discussion: The measures that may be reasonably used to comply with the requirements of the proposed Action Plan and revised DO objectives would not likely be located on a site which is on a list of hazardous materials sites. The location of these sites are well known throughout the Region and are subject to regulation by the Regional Water Board and/or USEPA.

7. Hazards and Hazardous Materials: e.)

For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

Answer: No impact.

Discussion: It is unlikely that the compliance measures identified in this SED would result in a safety hazard for people residing or working in the project area due to the relatively small scale of the structural BMPs contemplated for use by responsible parties.

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7. Hazards and Hazardous Materials: f.)

For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

Answer: Less than significant.

Discussion: Under the unlikely possibility that installation of compliance measures involving structural BMPs were located in the vicinity of a private airstrip, they would not result in a safety hazard for people residing or working in the project area due to the relatively small scale of the structural BMPs contemplated for use by responsible parties.

7. Hazards and Hazardous Materials: g.) Would the project:

Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural or non-structural BMPs that would impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Consideration of public health and safety is a key component in the development of site specific compliance measures for road construction and maintenance activities.

7. Hazards and Hazardous Materials: h.) Would the project:

Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Answer: No impact.

Discussion: None of the structural and non-structural BMPs identified in this SED would expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

8. Hydrology And Water Quality: a.) Would the project:

Violate any water quality standards or waste discharge requirements?

Answer: Potentially significant impacts.

Discussion: By requiring the implementation of compliance measures to reduce pollutants and the implementation of management plans to control all sources of non-point pollution, it is anticipated that compliance with the proposed TMDL Action Plan and revised DO objectives will have an overall beneficial impact on water quality in the Klamath River watershed. The creation of a comprehensive regulatory process by which

the implementation of compliance measures (non-structural and/or structural BMPs) by all responsible parties in the watershed for all non-point sources of pollution will dramatically minimize the level of pollutants discharged to waterbodies and will help ensure that waterbodies will meet water quality objectives and that beneficial uses are protected and restored.

If a decision is reached by the KHSA Settlement Parties that one or more of PacifiCorps dams in California will be decommissioned, then potentially significant adverse impacts to the water quality standards in place for the Klamath River could likely occur.

The dam decommissioning studies used to develop this environmental analysis indicate that the primary environmental impact associated with dam removal is the short term impact to water quality from the release of the stored in-reservoir sediment. The studies indicate that the material is primarily fine grained and will likely stay in suspension until it reaches the ocean. Based on conditions in the watershed (e.g. “wet” versus “dry” water year) the increase turbidity and suspended sediment loads could last from weeks to months. It is almost certain that dam decommissioning will result in potentially significant environmental impacts due to increased turbidity and suspended sediment loads, which would likely violate Basin Plan water quality standards for turbidity and suspended sediment. Short term water quality violations may be acceptable in cases where long term benefits to be beneficial uses outweigh short term impacts, based on detailed, site-specific information and findings.

8. Hydrology And Water Quality: b.) Would the project:

Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Answer: Less than significant.

Discussion: The proposed implementation plan has only identified one compliance measure that could potentially affect ground water supplies. This measure contemplates the use of groundwater (via well construction) in lieu of on-stream livestock watering. Due to the likely dispersed nature of this compliance measure and the relatively high cost in well development, it is staff’s judgment that the use of wells in lieu of other off-stream watering systems (e.g. spring development) will result in a less than significant risk of substantially depleting groundwater.

8. Hydrology And Water Quality: c.) Would the project:

Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Answer: Potentially significant impacts.

Discussion: This SED has identified a number of compliance measures that could result in the construction of structural BMPs, such as infiltration basins, field leveling or road construction, which could potentially cause an alteration of the existing drainage pattern of a site. In most cases however, these measures would be small and installed with appropriately designed mitigation measures, which would limit any alteration of the existing drainage pattern, and therefore would not result in substantial erosion or siltation on- or off-site.

The exception would be in the event of dam decommissioning when the Klamath River would establish a new channel through the reservoirs. The studies evaluated by Regional Water Board staff indicated that the greatest impacts from erosion or siltation would be during drawing down of the reservoir water level. However, once a new channel was established, the erosion of the in-reservoir sediment would dissipate.

8. Hydrology And Water Quality: d.) Would the project:

Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Answer: Less than significant.

Discussion: This SED has identified a number of compliance measures that could result in the construction of structural BMPs such as infiltration basins, field leveling or road construction, which could potentially cause an alteration of the existing drainage pattern of a site. In most cases however, these measures would be small and be installed with appropriately designed mitigation measures, which would reduce the chance of alterations of the existing drainage pattern causing an increased rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

8. Hydrology And Water Quality: e.) Would the project:

Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Answer: Less than significant.

Discussion: It is unlikely that the compliance measures identified in this SED would be located in either an area that was serviced by an existing or a planned storm water drainage system due to the lack of urbanized areas with storm drain systems in the Klamath River watershed. In addition, the implementation of properly designed compliance measures would not result in the concentration of runoff.

8. Hydrology And Water Quality: f.) Would the project:

Otherwise substantially degrade water quality?

Answer: Less than significant impact.

Discussion: As the goal of this project is to develop and implement a comprehensive watershed recovery plan for the restoration of the beneficial uses of water in the Klamath River, it is staff's judgment that it is extremely unlikely that thoughtfully selected, well-designed and implemented compliance measures would result in the substantial degradation of water quality. The exception to this is dam decommissioning and its impacts are addressed above under 8a and 8c above.

8. Hydrology And Water Quality: g.) Would the project:
Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Answer: Less than significant impact.

Discussion: None of the compliance measures identified in this SED would place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

Staff has determined that this finding is still appropriate even under a dam decommissioning scenario as the dams were not designed nor operated as flood control structures. As such their ultimately removal would not significant impact housing with a flood area as described above.

8. Hydrology And Water Quality: h.) Would the project:
Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED would place structures within a 100-year flood hazard area which would impede or redirect flood flows.

8. Hydrology And Water Quality: i.) Would the project:
Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Answer: Less than significant.

Discussion: None of the compliance measures identified in this SED contemplate the use of non-structural or structural BMPs that would expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

8. Hydrology And Water Quality: j.) Would the project:
Cause inundation by seiche, tsunami, or mudflow?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of non-structural or structural BMPs that would cause inundation by seiche, tsunami, or mudflow.

9. Land Use And Planning: a.) Would the project:
Physically divide an established community?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of non-structural or structural BMPs that would physically divide an established community.

9. Land Use And Planning: b.) Would the project:
Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Answer: Less than significant.

Discussion: The primary goal of this project is the protection and restoration of water quality and beneficial uses of water in the Klamath River watershed.

Therefore, it is staff's judgment that it is unlikely that compliance with the proposed Action Plan and revised DO objectives would conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect

9. Land Use And Planning: c.) Would the project:
Conflict with any applicable habitat conservation plan or natural community conservation plan?

Answer: Less than significant.

Discussion: It is unlikely that measures implemented to comply with this proposed Action Plan and revised DO objectives could conflict with the provisions of an adopted Habitat Conservation Plan or Natural Community Conservation Plan, as explained previously in the question 4(f), above.

Depending on the structural BMPs selected, direct or indirect impacts to existing fish or wildlife habitat may occur; however, any such impact would be temporary. BMPs that may not have an impact when implemented in one area could potentially have an impact if they are implemented in a sensitive area. Therefore, when installing structural BMPs that may include substantial earth movement, responsible parties will be required under their applicable permit (or as necessary to comply with applicable prohibitions), to consult with various Federal, State and local agencies, including but not limited to the county the project is located in, CDFG and the USFWS. If appropriate to avoid conflicts with any Habitat Conservation Plan or Natural Community Conservation Plan, the timing and/or location of the BMPs may be adjusted to reduce any potential conflict with any Habitat Conservation Plan or Natural Community Conservation Plan. If, however, such adjustments could not be made, the BMP would have to be changed to avoid any adverse impacts to rare, threatened or endangered species, or the discharge would not be permitted to occur.

Because of these mitigation requirements, conflict with the provisions of an adopted Habitat Conservation Plan or Natural Community Conservation Plan is not likely to occur.

10. Mineral Resources: a.) Would the project:
Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of non-structural or structural BMPs that would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

10. Mineral Resources: b.) Would the project:
Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of non-structural or structural BMPs that would result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

11. Noise: a.) Would the project result in:
Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Answer: Less than significant.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would result in an increase in exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

The implementation of some structural BMPs may result in localized increased noise levels. Such increased noise levels would likely be associated with heavy equipment operation associated with construction of structural BMPs. These impacts would be temporary, associated with the use of heavy equipment and would, therefore, not considered to be a significant impact.

11. Noise: b.) Would the project result in:
Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

Answer: Less than significant.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would result in the exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

The implementation of some structural BMPs may result in localized increased ground-borne vibration or ground-borne noise levels. Such increased levels would likely be associated with heavy equipment operation associated with construction of structural BMPs. These impacts would, however, be temporary and associated directly with the use of heavy equipment. Therefore, staff judges that the impact would not be considered significant.

11. Noise: c.) Would the project result in:
A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Answer: Less than significant.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project as noise generation is associated with the short term, temporary use of heavy equipment.

11. Noise: d.) Would the project result in:
A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Answer: Less than significant with mitigation.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project with the exception of a dam decommissioning scenario.

The construction and installation of some structural BMPs, such as filtration or settling basins, could result in temporary increases in existing noise levels, but this would be short term and only exist until construction is completed. The noise associated with the construction and installation of structural BMPs would be the same as typical construction activities in rural and urbanized areas, such as ordinary road and infrastructure maintenance and building activities. Although noise will be increased in the vicinity of where BMPs requiring heavy equipment use are constructed, these noise impacts will not be substantial.

Dam decommissioning activities will likely involve drilling and blasting of the concrete structures, this will likely cause an impact to the noise level in the surrounding communities. With the application of appropriate mitigation measures, such as notifying the community of noise generating activities such as drilling and blasting to allow for those sensitive to high noise levels to voluntarily be re-located during those periods or protect their hearing in other ways (e.g. staying indoors, using hearing protection), the impact would be less than significant.

11. Noise: e.) Would the project result in:

For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Answer: Less than significant.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would likely be located within an airport land use plan or within two miles of a public airport or public use airport. However, even if this were to occur, the implementation of the compliance measures would not result in excessive noise levels. The use of heavy equipment for the construction and installation of some structural BMPs could result in temporary increases in existing noise levels, but the noise associated with heavy equipment use is not any louder than noises that would typically occur within two miles of an airport.

11. Noise: f.) Would the project result in:

For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Answer: Less than significant.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would likely be located in the vicinity of a private airstrip.

However, even if this were to occur, the compliance measures identified in this SED would not result in excessive noise levels. The use of heavy equipment for the construction and installation of some structural BMPs could result in temporary increases in existing noise levels, but the noise associated with heavy equipment use is not any louder than noises that would typically occur within the vicinity of a private airstrip.

12. Population And Housing: a.) Would the project:
Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).

12. Population And Housing: b.) Would the project:
Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

12. Population And Housing: c.) Would the project:
Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED would displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

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13. Public Services: a.)

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would have an effect upon, or result in a need for new or altered fire protection services.

13. Public Services: b.)

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Police protection?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would have an effect upon, or result in a need for new or altered police protection services.

13. Public Services: c.)

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Schools?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would have an effect upon, or result in a need for new or altered schools or school services.

13. Public Services: d.)

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Parks?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would have an effect upon, or result in a need for new or altered parks.

13. Public Services: e.)

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Other public facilities?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would have an effect upon public facilities.

14. Recreation: a.)

Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Answer: Less than significant with mitigation.

Discussion: None of the compliance measures identified in this SED, with the exception of dam decommissioning, contemplate the use of structural BMPs that would increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

In the event that the three reservoirs are decommissioned, flatwater recreation users will have to use the other flatwater facilities in the region. Once a decommissioning plan is developed, mitigation measures identified in the plan must include measures to ensure

that the other regional facilities have the infrastructure in place to support the increased user base. Likely mitigation measures could include such things as installation of restrooms, boat ramps, garbage service, etc.

14. Recreation: b.)

Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Answer: No impact

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

15. Transportation/Traffic: a.) Would the project:

Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?

Answer: Less than significant.

Discussion: None of the compliance measures identified in this SED, other than for centralized treatment, contemplate the use of structural BMPs that would cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections). If the centralized treatment option is pursued a site specific environmental analysis to comply with CEQA would be required. This site specific analysis would provide the level of detail needed to evaluate the related traffic impacts and potential mitigation measures.

15. Transportation/Traffic: b.) Would the project:

Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED, other than for centralized treatment, contemplate the use of structural BMPs that would exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways. See discussion above more on centralized treatment analysis.

15. Transportation/Traffic: c.) Would the project:

Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

15. Transportation/Traffic: d.) Would the project:

Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Answer: Less than significant.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses.

15. Transportation/Traffic: e.) Would the project:

Result in inadequate emergency access?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would result in inadequate emergency access.

15. Transportation/Traffic: f.) Would the project:

Result in inadequate parking capacity?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would result in inadequate parking capacity.

15. Transportation/Traffic: g.) Would the project:

Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

Answer: No impact.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

16. Utilities and Service Systems: a.) Would the project:

Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Answer: Less than significant.

Discussion None of the compliance measures identified in this SED contemplate the use of structural BMPs would cause any exceedence of wastewater treatment requirements.

16. Utilities and Service Systems: b.) Would the project:

Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Answer: Less than significant.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would result in a wastewater treatment provider needing to expand existing treatment facilities.

16. Utilities and Service Systems: c.) Would the project:

Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Answer: Less than significant.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would result in a need for new storm water systems or the expansion of existing facilities.

16. Utilities and Service Systems: d.) Would the project:

Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Answer: Less than significant.

Discussion: None of the compliance measures identified in this SED contemplate the use of structural BMPs that would require new or expanded entitlements for water supplies.

A number of compliance measures identified in this SED include use of water supplies for such things as dust abatement on native surface roads, construction of off-channel livestock watering facilities or temporary irrigation for riparian restoration (tree planting) activities. The selection of the appropriate compliance measures by responsible parties will need to take into consideration their existing water resources. Basing selection of compliance measures on existing water resources will prevent the need to seek new entitlements.

16. Utilities and Service Systems: e.) Would the project:

Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Answer: Less than significant.

Discussion: It is unlikely that the implementation of compliance measures identified in this SED as would be located in areas serviced by a wastewater treatment provider. Therefore it is unlikely that implementation of the structural BMPS identified in this SED will have resulted in the need for the treatment provider to make this determination.

16. Utilities and Service Systems: f.) Would the project:

Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Answer: Less than significant.

Discussion: Other than the discussion of compliance measures for algae dewatering and disposal, none of the compliance measures identified in this SED contemplate the use of structural BMPs that would generate a significant source of solid waste contemplate. Not much information was provide on the solid waste disposal aspects of the algae dewatering options, as such analysis of the possible impacts and potential mitigation measures would be based on conjecture and speculation. If this option were selected a site specific environmental analysis (most likely an environmental impact report [EIR]) would be required to comply with CEQA.

Construction and implementation of structural BMPs may generate solid wastes requiring disposal such as earthen material or erosion control materials (e.g. silt fences, temporary fencing, rusted out culverts). The amount of waste needing disposal, however, will be very minimal, and could therefore be served by an existing landfill.

16. Utilities and Service Systems: g.) Would the project:

Comply with federal, state, and local statutes and regulations related to solid waste?

Answer: Less than significant.

Discussion: As noted above, implementation of structural BMPs to comply with requirements of the proposed Action Plan and revised DO objectives will generate very little solid waste. There will, therefore, be no problems with compliance with federal, state, and local statutes and regulations related to solid waste disposal. See discussion above for more on potential impacts related to landfills.

In the event of dam decommissioning, a disposal site for the waste concrete will need to be designated. Given the re-use of concrete debris for building material (riprap, reuse at concrete batch plants) it is unlikely that a significant amount of solid waste would be generated from dam decommissioning.

17. Mandatory Findings of Significance:

Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Answer: Potentially significant impacts.

Discussion: All of these compliance measures identified in this environmental analysis will likely improve water quality from the current baseline, where many discharges of pollutants are currently occurring in the watershed and will likely continue without the application of these additional protections. This also would be the case if the Parties involved in the AIP decide to decommission one or more of PacifiCorps' dams in California.

Non-structural BMPs will not result in the substantial degradation of the environment for plant and animal species because none of the non-structural BMPs would have any physical effects that could degrade the environment or impact plant or animal species.

As discussed above, under Biological Resources- Category 4d, plant and animal species could potentially be adversely affected by the installation and operation of structural BMPs that involve substantial earth movement. If a responsible party proposed installation of a BMP that would require substantial earth movement, the discharger would be required to consult with federal, state and local agencies, including but not limited to the county the project is located in, CDFG and the USFWS, and implement mitigation identified by the agencies to avoid impacts to rare, threatened or endangered species. If no such mitigation is available, the use of that compliance measure in the specific area should not be implemented. In most cases the installation of structural

BMPs would be temporary, and any impacts could be avoided by adjusting the timing and/or location of the BMPs to take into account any candidate, sensitive, or special status species or their habitats.

The exception to this would be short term impacts associated with dam decommissioning which has the potential to significantly impact water quality from the release of increased loads of fine grained sediment. It is estimated that impacts to water quality would range from weeks to months with the application of appropriate mitigation measures.

The potential impacts of the project will not cause a significant cumulative impact in the environment with the exception of a dam decommissioning scenario. In fact, the adoption of the proposed Action Plan and revised DO objectives should result in improved water quality in the Klamath River watershed and will have significant beneficial effects on the environment over the long term.

17. Mandatory Findings of Significance:

Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Answer: Potentially significant impacts.

Discussion: Cumulative impacts, defined in section 15355 of the CEQA Guidelines, refer to two or more individual effects, that when considered together, are considerable or that increase other environmental impacts. Cumulative impact assessment must consider not only the impacts of the proposed Action Plan and revised DO objectives, but also the impacts from other Basin Plan Amendments, municipal, and private projects, which have occurred in the past, are presently occurring, and may occur in the future, in the watershed during the period of implementation.

Structural BMPs that may be implemented are not likely to have cumulative impacts on the environment. Implementation of most of the structural BMPs will be short-term, temporary and spatially distributed across the watershed, and will not have significant adverse effects on the environment. BMPs that involve substantial earth movement could have potentially significant cumulative impacts. However, many of these activities will be regulated under existing State and Regional permits, including but not limited to state-wide CalTrans stormwater permit, stormwater permit for construction sites over one (1) acre or timber harvest operations on public and private lands. The likelihood of installation of structural BMPs on federal land is quite high as 66% of the watershed is in federal ownership. Compliance measures implemented for activities such as significant road construction projects will be subject to NEPA requirements. It is also important to note that Regional Water Board staff is currently developing a permit (WDR/waiver) for the Regional Water Board's consideration to regulate all sources of non point source pollution from lands managed by the USFS. Regional Water Board staff's engagement in

these regulatory programs will provide an opportunity to limit the potential for cumulative impacts by ensuring that multiple projects proposing implementation of BMPs with the potential to cause short-term impacts are phased appropriately to limit potential cumulative impacts.

Based on a review of the referenced dam removal studies, Regional Water Board staff has determined that short term impacts from elevated turbidity and suspended sediment loads as a result of dam decommissioning will potentially result in a significant cumulative impact to the already stressed fisheries and aquatic resources in the Klamath River. As there is no decommissioning plan available for review, the actual environmental impacts are difficult to determine.

17. Mandatory Findings of Significance:

Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Answer: Less than significant

Discussion: As explained previously, the proposed Action Plan, including measures to comply with the revised DO objectives, will improve long term water quality by providing a regulatory program designed to protect and restore water quality and the beneficial uses of water in the Klamath River watershed. An important objective of the Klamath River TMDLs is the restoration of a healthy and viable salmonid fishery. This important beneficial use is critical for the subsistence and health of the Tribes in the watershed.

9.8 Alternative Means of Compliance

The CEQA requires an analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts²². The responsible parties can use the structural and non-structural compliance measures (BMPs) described in section 9.5, or other structural and non-structural BMPs, to control and prevent pollution, and meet the requirements of the proposed Action Plan and revised DO objectives. The alternative means of compliance with the proposed Action Plan and revised DO objectives consist of the different combinations of structural and non-structural BMPs that the responsible parties might use to meet their load allocations and achieve the numeric targets and revised DO objectives. Because there are innumerable ways to combine BMPs, all of the possible alternative means of compliance cannot be discussed here. However, because most of the adverse environmental effects are associated with the construction and installation of structural BMPs related to earth movement or construction of infrastructure (e.g., fencing) to avoid or eliminate impacts,

²² Cal. Code Regs., tit. 14, § 15187(c)(3).

compliance alternatives should maximize the use of non-structural BMPs to the extent feasible, minimize use of structural BMPs to the extent feasible, and design structural BMPs to take into consideration site-specific conditions to minimize environmental effects.

9.9 CEQA Determination

Adoption of the proposed Action Plan and revised DO objectives is both necessary and beneficial. Currently the Basin Plan does not include a comprehensive regulatory program designed to protect and restore the beneficial uses of water in the Klamath River basin. The Klamath TMDL implementation plan would provide the framework for this comprehensive program. The implementation of compliance measures that likely may be implemented to comply with the proposed Action Plan and revised DO objectives will not result in significant adverse impacts that cannot be reduced to levels of insignificance with the implementation of thoughtfully designed and executed mitigation measures with the exception of several potentially significant adverse environmental impacts associated with dam decommissioning. Implementation of many of the identified compliance measures, including dam decommissioning, could result in temporary (short term) adverse impacts to the environment. Most of these impacts, however, can be reduced to levels of less than significant with mitigation. For example, implementation of BMPs that require substantial earth movement, such as construction of filtration or settling basins, and road construction, reconstruction and maintenance could result in significant impacts if they were conducted in sensitive areas or during time periods when the most sensitive life stages of fall Chinook salmon are present. To alleviate any such impacts, dischargers will be required to consult with federal, state and local agencies, including but not limited to the county the project is located in, CDFG and the USFWS, and implement mitigation identified by the agencies to avoid impacts to rare, threatened or endangered species. In most cases the installation of structural BMPs would be small scale in size and application, and any impacts could be avoided by adjusting the timing and/or location of the BMPs to take into account any candidate, sensitive, or special status species or their habitats.

If the KHSAs Parties decide to move forward with dam decommissioning, a plan would have to be developed, which would then require a thorough environmental review (EIS and/or EIR) prior to the federal and/or state agencies permitting the activity. Only once a plan has been developed will it be possible to assess potentially significant adverse effects and mitigation measures that could reduce impacts to levels of insignificance. If no such mitigation is available, the activity would not be authorized until such time as a regulatory path was made available to allow for large-scale restoration projects such as dam decommissioning, Trinity River restoration actions and restoration work on USFS lands.

The Staff Report, the draft Basin Plan Amendments, and the Environmental Checklist and associated analysis provide the necessary information pursuant to state law to conclude that the proposed Action Plan, revised DO objectives, and the associated reasonably foreseeable methods of compliance (i.e. BMPs) will not have a significant

CHAPTER 9. REFERENCES

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