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Comments via Email: ForestPlan_Comments@waterboards.ca.gov
Exhibits 1-114 on CD via Fedex (8/23/11)

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Division of Water Quality
State Water Resources Control Board
1001 I Street, 15th Floor
Sacramento, California 95814

Re: Comments on U.S. Forest Service Waiver

Dear Mr. Lee:

Thank you for the opportunity to comment on the draft Waiver of Waste Discharge Requirements for Nonpoint Source Discharges Related to Certain Activities on National Forest System Lands in California (Waiver). These comments are submitted on behalf of the Central Sierra Environmental Resource Center, Environmental Protection Information Center, High Sierra Hikers Association, Sierra Forest Legacy, the Western Watersheds Project, Forest Issues Group, Public Employees for Environmental Responsibility, Wildlands CPR, The Wilderness Society, Los Padres Forest Watch, Friends of the Eel River, Defenders of Wildlife, Sequoia Forestkeeper, Klamath Forest Alliance, California Watershed Network, Snowlands Network, and Friends of the River.

Certain of these groups previously submitted comments and materials on earlier drafts of the Waiver. We ask that comments and materials submitted by these groups in response to earlier drafts of the waiver be included in the record presented to the Board to inform its decision.

We submit with these comments a compact disc that includes PDFs of exhibits, documents, and other materials that the comments cite. Certain other cited documents are commonly available on the web or in professional publications. If we may assist the Board in securing PDFs of any of those documents as well, please let us know.

Background:

In 2010, California' population increased to more than 37 million people. (U.S. Census Bureau 2010.) California's expanding population continues to place ever-increasing demands on the limited supply of clean drinking water. (Carle 2004.) For example, sixty-five percent of California's fresh surface water for domestic and commercial use comes from the Sierra Nevada. (Sierra Nevada Conservancy 2008.) Watersheds store an inordinate amount of water for recreation, agricultural, domestic, and other uses. For example, the Stanislaus and Tuolumne River watersheds provide about three million acre-feet of water storage, and the Mokelumne River provides close to one million acre feet of water storage. (U.S. FWS 2010.)

The impact of nonpoint source pollution in watershed regions demonstrates the fragility of these ecosystems. In the high Sierra Nevada, for example, watersheds generally consist of granite or metamorphic bedrock with little topsoil. As a result, soil buffering capacity is extremely low, providing little or no biogeochemical retention or transformation of nutrients such as nitrogen and phosphorous and "[r]elatively small amounts of nutrient addition or habitat disturbance can lead to significant impacts on nutrient flux and subsequent impacts on water quality and aquatic ecosystems." (Derlet et al. 2008.)

Surface water quality and the effects of nonpoint source pollution from activities such as livestock grazing are important to hikers, backpackers, fishermen, and downstream urban water districts. In regions like the Sierra Nevada, 50 to 60 million visitors per year come and rely on the waters for recreation and tourism activities. (Sierra Nevada Ecosystem Project Report 1996.) Water quality in the backcountry is also an environmental justice issue; not all the visitors can afford or have access to filters to protect themselves, and not all visitors are aware of the possibility of fecal coliform contamination or other pollutants.

Much of the Sierra Nevada watershed encompasses roadless, remote backcountry wilderness at high elevations that, without pollutant sources, should yield outstanding water quality. (Derlet et al. 2010.) The importance of the water in this region is exemplified by a cooperative agreement between the City of San Francisco-Hetch-Hetchy Authority and Yosemite National Park related to water resource management.

The Forest Service manages approximately 20 million acres of land in California. In addition to the many connections to water resources experienced by millions of recreational visitors each year, much of the lands under Forest Service management are watersheds that provide the water supply for the approximately 40 million people of California. Forest Service lands in California also provide habitat for many native, rare, endemic, threatened, and endangered species, including aquatic species that are impacted by activities that cause nonpoint sources of pollution on Forest Service lands.

California Environmental Quality Act (CEQA).

The proposed action is to waive waste discharge requirements for numerous activities occurring on Forest Service lands throughout California, all of which have the potential for significant impacts to water quality due to non-point source discharges of pollutants. The Board's decision to consider approval of a proposed Waiver by adopting an Initial Study-Mitigated Negative Declaration (MND) is contrary to CEQA for a number of reasons. The Board's proposal to consider approval of this project using an MND violates CEQA because a fair argument can be raised that the Forest Service's Water Quality Management Plan (Plan) and accompanying BMPs will not avoid significant impacts to water quality. The MND also fails to satisfy CEQA's informational requirements, because it does not provide adequate information about how the Plan or BMPs will ensure Forest Service activities do not cause significant impacts to water quality.

CEQA applies to discretionary activities undertaken by a public agency. (Pub. Res. Code § 21080.) The Board is subject to CEQA as a state agency making a discretionary decision with

the potential for impacts to the physical environment. (Pub. Res. Code § 21100.) As part of CEQA review, the agency undertakes an "Initial Study" of the project. (14 Cal. Code Regs § 15063.) If the Study demonstrates that the project will not have a significant effect on the environment, the agency makes a "negative declaration" to that effect. (Pub. Res. Code § 21080(c.).) If the "Initial Study" determines that the project may have a significant effect, an Environmental Impact Report (EIR) is required. (Pub. Res. Code § 21151.)

CEQA defines a "significant effect" as a "substantial, or potentially substantial, adverse change." (Pub. Res. Code § 21068.) This means that an activity has a significant effect if it "has the potential to degrade the quality of the environment." (*Azusa Land Reclamation Company, Inc. v. Main San Gabriel Basin Watermaster* (1997) 52 Cal. App. 4th 1165, 1192.)

CEQA Guidelines require a mandatory finding of significance for a project with "possible environmental effects which are individually limited but cumulatively considerable." "'Cumulatively considerable'" means that the incremental effects of an individual 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." (14 Cal. Code Regs. §15065(c)); *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal. App. 4th 98, 114; *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal. App.3d 692, 720-721.)

CEQA's fundamental policy is that public agencies "shall regulate such activities so that major consideration is given to preventing environmental damage." (*Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 390; Pub. Res. Code § 21000(g.).) The "primary means" by which the legislative goals of CEQA are achieved by preparation of an EIR. (*Laurel Heights*, *supra*, 47 Cal.3d at 392; Pub. Res. Code § 21080(d), 21100; 14 Cal. Code Regs. § 15080.) The EIR is "an environmental 'alarm bell' whose purpose is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return." (*Laurel Heights*, *supra*, 47 Cal.3d at 392; *County of Inyo v. Yorty* (1973) 32 Cal. App.3d 795, 810.) An EIR is intended to serve as "an environmental full disclosure statement." (*Rural Land Owners Assn. v. City Council of Lodi* (1983) 143 Cal. App.3d 1013, 1020.)

CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project. (14 Cal. Code Regs. § 15002(a)(1).) In addition, an EIR must identify mitigation measures and alternatives to the project that may reduce or avoid the project's significant adverse impacts, thus accomplishing CEQA's basic statutory goals. (*See Laurel Heights, supra*, 47 Cal.3d at 400-403; *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564; Pub. Res. Code §§ 21002 & 21002.1.) The analysis of feasible mitigation measures and a reasonable range of alternatives is crucial to CEQA's substantive mandate that significant environmental damage be substantially lessened or avoided where feasible. (Pub. Res. Code § 21002 & 21081; 14 Cal. Code Regs. § 15002(a)(2) & (3); *Laurel Heights, supra*, 47 Cal.3d at 392, 404-405.) CEQA requires government agencies to disclose to the public the reasons why they have approved a particular project resulting in significant environmental effects. (14 Cal. Code Regs. § 15002(a)(4).) "The EIR process protects not only the environment but also informed self-government." (*Laurel Heights, supra*, 47 Cal.3d at 392.)

CEQA must be interpreted so as to afford the fullest possible protection to the environment. (*Laurel Heights, supra*, 47 Cal.3d at 390; *Friends of Mammoth v. Board of Supervisors* (1972) 8 Cal.3d 247, 259.) EIRs demonstrate to an apprehensive citizenry that the agency has analyzed and considered the ecological implications of its action. (*No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 86.)

Environmental Baseline and Setting:

The MND does not accurately characterize the environmental impacts at issue in this critical regulatory decision. The MND provides a summary of the environmental setting that is largely limited to a description of the physical areas that will be covered by the waiver. (MND at 21-24.) Beyond that, the MND offers only the following:

> An extensive system of roads has been built on NFS land in California, especially following the end of World War II. Historically, such roads were built primarily to accommodate commodity extraction (e.g., timber, minerals, water). Today, some continue to be used as access roads, many have been converted to recreational roads or trails, while others have been closed or decommissioned. Portions of the existing road system are significant sources of sediment discharges. NFS lands are also home to extensive recreational facilities and activities. These include campgrounds, hiking and biking trails, boating docks, and trails designated for OHV use. Certain historic uses of NFS lands may also be considered part of the environmental setting. These include existing areas of concentrated recreational use, public campgrounds, and trails. Additionally, existing grazing under long-term allotments is an ongoing NPS activity. While these activities are being brought under statewide regulation by the State Water Board with the Proposed Statewide Waiver, they pre-exist Board action and are part of the environmental baseline to be considered in the analysis.

(MND at 25.)

The foregoing does not constitute an adequate description of the environmental setting given that the Waiver is proposing to regulate these Forest Service activities on hundreds of thousands of acres in California according to the Plan and list of BMPs. The MND provides no description of how these activities have been regulated in the past and how that regulation in the form of BMPs or otherwise has historically been successful or unsuccessful. This information is critical to an evaluation of whether proposed BMPs underpinning the Waiver are adequate to mitigate for the significant effects of these activities. For example, the passage above indicates that the existing road system has been a significant source of sediment discharge. Yet the MND does not explain which if any BMPs were in place to regulate those roads in the past, and thus provides no regulatory baseline to understand how or whether any continuing, similar, or new BMPs will correct this historical significant impact.

The MND states that the environmental baseline for purposes of analysis is continuing degradation of water quality due to the State Board's failure to regulate non-point source polluting activities on Forest Service lands:

> [M]any of the activities and impacts discussed do not require full environmental analysis because the Board action will generally improve, rather than worsen, environment quality and because many of the activities permitted under the Proposed Statewide Waiver are already part of the environmental baseline. As a regulatory action aimed at mitigating the water quality impacts of NPS activities on NFS lands, the Board action will generally improve, not worsen, the environmental impacts of such activities. At a programmatic level, the environmental impacts of NPS activities on NFS lands are expected to decrease as a result of the Board action, even if the action will permit activities to go forward with impacts at a localized project level. Additionally, aspects of this action are exempt from CEQA as procedures for protection of the environment.

(MND at 25; s*ee also* MND at 61 (stating that existing off-highway vehicle (OHV) uses are part of the environmental baseline).)

This presentation is legally flawed. The cases cited in the MND do not address when an agency proposes to adopt a regulatory program purporting to regulate future activities that will cause future environmental impacts. Activities such as grazing, logging, OHV riding are not legally permitted in the absence of either (1) waste discharge requirements or (2) a valid waiver from WDRs under Water Code § 13269. Thus, the Board may not presume for the purposes of the environmental baseline that in the absence of a regulatory waiver, these harmful activities would simply continue without regulation. In other words, the legal alternative to the proposed waiver is not continued lack of regulation but, instead, the issuance of waste discharge requirements by the Board, or cessation of the activities as required by law. As the Board is aware, the parameters of an adopted regulatory program may lead to indirect environmental impacts that must be assessed under CEQA. (*See, e.g., Mountain Lion Foundation v. Fish & Game Commission* (1997) 16 Cal. 4th 105, 125-127; *Dunn-Edwards Corp. v. Bay Area Air Quality Management Dist*. (1992) 9 Cal. App. 4th 644, 656-658; *Int. Longshoremen's & Warehousemen's Union v. Board of Supervisors* (1981) 116 Cal.App.3d 265, 276.)

The MND fails to present this information so the public can understand what is at stake here, and instead falsely represents that for most activities there can by definition be no new environmental impacts. This information skews the public's ability to meaningfully evaluate the potential effects of the waiver, and fails to acknowledge the potential of alternative regulatory regimes – none of which is presented or discussed in the MND - that could avoid the potential for significant effects.

The MND's presentation is also flawed in that it fails to describe or acknowledge existing regulatory waivers applying to certain Forest Service activities. For example, the Lahontan regional board's 2009 waiver for certain timber activities on Forest Service lands will be weakened by the proposed Waiver. Yet the MND contains no discussion of the extent to which weakening of existing regulatory regimes has the potential for significant impacts. This lack of presentation fails to meet CEQA's informational requirements. (*See, e.g., Association of Irritated Residents v. County of Madera* (2003) 107 Cal. App. 4th 1383, 1391 (ruling that a prejudicial abuse of discretion occurs if the failure to include relevant information precludes informed decisionmaking and informed public participation, thereby undermining CEQA).)

Adaptive Management Strategy:

The Waiver and Plan include an adaptive management strategy that lacks any standards and thus has the potential for significant effects under CEQA. In several instances the Waiver acknowledges a lack of information about whether the Plan and BMPs will avoid significant effects. Rather than prepare an EIR as required by CEQA, however, the Waiver proposes an adaptive management strategy that is supposed to lead to regulatory correction of activities that continue to adversely affect water quality from Forest Service non-point source activities.

Under CEQA, the Board's ability to rely on an adaptive management strategy or any similar approach to avoiding significant impacts is constrained by caselaw requiring a commitment to specific performance standards and triggers for action. Otherwise, adaptive management is nothing more than a promise to try and achieve over time general environmental objectives such as the protection of water quality. (*See e.g., See e.g., Gray v. County of Madera* (2008) 167 Cal. App. 4th 1099, 1118 ("[W]e conclude that here the County has not committed itself to a specific performance standard. Instead, the County has committed itself to a specific mitigation goal.").)

An effective adaptive management strategy requires a number of components, as summarized by Laurel Collins. (Collins Comments). Adaptive management is based on the principle that there are uncertainties in how to regulate effectively, and that mechanisms for changing regulatory oversight should be built into the system in order to ensure the achievement of regulatory goals. Adaptive management is a structured decision-making process that includes the following components: 1) articulate clear project goals, objectives and success criteria; 2)collect existing knowledge/practices relative to achieving the goals; 3) identify information gaps and related research needs; 4) develop a strategy and apply knowledge and relevant practices toward achieving the clear project goals; 5) develop a clearly defined and defensible monitoring program to determine whether the goals/objectives are being achieved; 6) identify pre-defined potential management responses if project goals/objectives are not met; 7) use monitoring data to determine whether success criteria have been met and whether a management response is necessary; 8) reassess and improve practices and reconsider the goals or outcomes. (*See, e.g.,* Sediment Source Control Handbook, Sierra Business Council, produced in collaboration with the Lahontan Regional Water Quality Control Board and the California Alpine Resort Environmental Cooperative (Jan. 2009).)

The adaptive management strategy fails to meet the minimum criteria for several of the most critical steps in this process. The Plan adopts a Plan/Do/Check/Act (PDCA) framework for implementing adaptive management. (Plan at 194.) The PDCA framework sets forth a proposed procedure for how adaptive management will function, but the framework lacks substantive standards that would ensure that significant pollutant discharges will be avoided. Instead, as set forth below, the adaptive management strategy in the Plan appears designed to avoid any commitment to taking regulatory action that would ensure that significant pollutant discharges are avoided.

The adaptive management strategy sets forth general project goals, stated as allowing Forest Service activities to be implemented in a manner that protects water quality and beneficial uses. However, the strategy provides no specific project objectives that could be relied on to guide the

process and ensure that the general project goals can be met. For an adaptive management strategy to be successful, project objectives must be: 1) specific; 2) measurable; 3) realistic and attainable (physically and economically); 4) directly related to the problem; 5) time specific (*i.e.*, clearly stated when and how long); 6) be tied to specific measurable success criteria. In contrast, the adaptive management strategy in the Plan establishes no specific objectives other than the vague direction to protect water quality. The strategy provides no measurable standards that would trigger action, nor any timetable that would lead to effective changes to ensure that water quality is protected. The strategy simply sets forth a set of planning processes that are supposed to achieve a set of general goals listed in the Plan on page 200 - such as meeting Basin Plan water quality objectives -- are being met. But in the absence of measurable standards that would trigger corrective action, there is no mechanism that will ensure this will occur. (Collins Comments.) This is particularly true for activities such as grazing or off-highway vehicles that have a history of inadequate regulatory enforcement and adverse impacts to water quality.

The adaptive management strategy also lacks clearly defined parameters under which monitoring triggers the need for regulatory action. Instead, the strategy simply refers to reviewing monitoring results, but provides no information about which if any results will actually trigger changes, and which will simply be considered and rejected. As a result, the Plan does not explain how monitoring results will be interpreted to determine whether or not water quality objectives are being adversely affected.

The adaptive management strategy also lacks any pre-defined management responses that would ensure that action will in fact be taken to avoid significant pollutant discharges. Instead, the strategy merely requires that Forest Service and other officials confer and discuss effectiveness of BMPs. If BMPs are not effective, the strategy does not require any particular action to be taken. Instead, the Forest Service may simply continue to meet and consider the issue.

In preparing the MND, the Board rejected as mitigation an adaptive management strategy that would have included specific project objectives such as avoiding sediment or other pollutant discharge above a certain level, monitoring triggers designed to determine whether those objectives were being met, and pre-defined management responses with specific timelines for action. As discussed by Collins, the Board's failure to adopt an adaptive management strategy with actual performance standards and defined triggers for corrective action has the potential for significant impacts, because it allows for the same type of regulatory inaction that has occurred over the last few decades with regards to regulation of these non-point sources of pollution. As such, the two different adaptive management strategies should have been evaluated side by side in an EIR, and their relative efficacy in avoiding future significant water quality impacts discussed and analyzed.

Further, with activities such as grazing or off-highway vehicles, there is no discussion of the types of challenges faced by the Forest Service in regulating their accompanying non-point source discharges. The evidence demonstrates an historical inability on the part of the Forest Service to enforce existing BMPs or otherwise effectively regulate the activities so as to avoid significant water quality impacts. This information is also critical for the public to evaluate the efficacy of any new BMPs in the Plan. For example, if a historical lack of funding, staffing or simply logistical infeasibility make effective enforcement of BMPs unlikely, this fact would tend

to undermine any conclusion in the MND that the Plan will avoid significant impacts, thereby justifying the adoption of a waiver without an EIR. The MND states that "[t]here is an expectation that each forest will make reasonable progress towards completing inventories and remediating legacy nonpoint sites, especially where timely implementation is necessary for sediment TMDL compliance." (MND at 45.) However, in many cases there is no reasonable basis for this expectation, which would be clear had the Board set forth the real and difficult logistical challenges the Forest Service faces in regulating itself into compliance.

Lack of Disclosure of Regulatory Background:

The MND's failure to provide this information follows from its failure to characterize accurately the manner in which the Waiver has the potential for significant effects. The MND is confusing in this regard, stating at one point that the Waiver will have no significant effects because it will improve over past regulation, but then going on to analyze the purported projected impacts of the Plan. This approach means there is no real analysis of how the Plan or BMPs will avoid significant water quality impacts when Forest Service regulation has been ineffective in the past. This does not meet CEQA's minimum standard that the public be fully informed about how impacts will be avoided. (*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.App.4th 412, 435; *San Franciscans for Reasonable Growth v. City & County of San Francisco* (1984) 151 Cal.App.3d 61, 74.)

The Waiver project is undefined because it purports to apply only to activities that do not have a significant impact on the environment. This approach is contrary to CEQA because it leaves open the very question at issue, which is which activities have the potential for significant impacts and which do not. For example, documented evidence in the record proves that at least livestock grazing and OHVs have historically had significant impacts on water quality in the local areas affected. Yet the Waiver purports to waive waste discharge requirements for these ongoing activities in the future based on BMPs, the efficacy of which are never analyzed in the MND. As a result, it is not clear which activities will be subject to the waiver and which will not. For example, if a specific grazing allotment is having significant impacts to local water quality, does that mean that allotment is not subject to the waiver, in which case it would operate in violation of the Water Code? This does not appear to be the result intended by the Waiver, yet it is not clear what the alternative result would be. The Waiver purports to establish mechanisms whereby the Board may withdraw the Waiver as to certain activities should it find that those activities are having significant effects on water quality. However, this does not mean the activity is not intended to be covered by the Waiver.

As a legal matter, the Board may not avoid preparing an EIR in adopting a new regulatory program by simply stating that the program applies only to projects that do not have significant impacts, because to do so creates an uncertain project description under CEQA. Further, many if not all of the regulated activities -- grazing, roads, logging, OHVs -- contribute to overall cumulative water quality effects. Thus, there is no basis for distinguishing the so-called "insignificant" impacts of one particular piece of a specific activity and the overall cumulatively significant effect to which all are contributing. (14 Cal. Code Regs. § 15065(c) ("Cumulatively considerable" means that the incremental effects of an individual 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."); *Communities For a Better Environment v. California Resources Agency* (2002) 103 Cal. App. 4th 98, 114; *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal. App.3d 692, 720-721.)

Decisionmaking Processes:

The Plan, Waiver, and MND provide few to no specifics as to what the proposed mitigation is or how any measures may in fact mitigate the adverse effects of nonpoint source discharges from activities on Forest Service lands. The documents also simply refer to other documents as support or facts to explain why proposed measures should be acceptable, but they fail to explain why that information is relevant and may support the Waiver. The documents fail to specify what provisions from other plans are appropriate for consideration or why or how these other plans can mitigate the significant effects of the Waiver. (*E.g.,* MND at 39 (referring to USFS Guidance, and "any applicable basin plan").)

The Plan states that, as to site-specific projects, the "final decision authority lies with the [Forest Service] line officer." (Plan at 15.) The Plan also states that:

> Commonly, the methods and techniques for water quality protection that apply to a project site are a composite package of multiple BMPs with site-specific applications the interdisciplinary team develops. The appropriate BMPs and the methods and techniques of implementing the BMPs are included in the environmental documentation, permit, contract, or other controlling document used to conduct and administer the project.

(Plan at 16.) Nothing in these provisions of the Plan requires the Forest Service line officer to choose any specific BMP, or indeed, any BMP at all. Instead, the Plan makes it clear that the line officer has complete discretion (1) whether to choose any BMP, and (2) how to implement any BMP.

The Plan states: "[t]he NEPA process is crucial for developing site-specific methods and techniques for applying BMPs to fit individual project needs." (Plan at 15.) The Plan does not, however, make clear or bind the Forest Service to prepare an environmental assessment or environmental impact statement under the National Environmental Policy Act (NEPA) when it evaluates whether to issue a new permit or other authorization, or to renew an expired one. It must be assumed that if the Forest Service does not prepare an EA or an EIS, then it will not consider, analyze, or disclose publicly any choice whether to apply any BMP or not.

Further, the Waiver does not address whether the many projects that the Forest Service categorically excludes from analysis under NEPA affect water quality and, if so, how the Board proposes to ensure that categorically excluded projects do not contribute to the degradation of California waters. The Waiver fails to specify or require that projects the Forest Service categorically excludes from analysis under NEPA will also be required to contain terms, conditions, and other enforceable measures to ensure that water quality is restored or protected through implementation of the approved project.

The Plan acknowledges the diversity of Forest Service-managed lands in California. (Plan at 15.) The Plan states: "the most appropriate abatement and control measures" are also variable. (*Id.*) Despite this acknowledgement, the Board proposes to waive waste discharge requirements for essentially all Forest Service nonpoint source activities. Further, the Board's proposal divorces regional boards from their authority to require waste discharge requirements or adopt limited waivers that focus on specific resources and concerns in a particular region. As a result, the Waiver essentially ignores local conditions, proposes to leaves an unacceptable amount of discretion regarding any actual implementation in the hands of Forest Service line officers, and fails to provide adequate guidance for line officers to make decisions related to nonpoint sources of pollution to comply with water quality standards.

The BMPs in the Plan are inadequate, or ineffective, or unenforceable, or all three. If the Waiver is adopted, activities on Forest Service lands causing nonpoint sources of pollution will continue to have a significant effect on the environment. Accordingly, the MND for the Waiver is inadequate, and an EIR must be prepared under CEQA.

Water Code Provisions:

The Waiver is inconsistent with the California Water Code, the State of California Nonpoint Source Pollution Control Program, the State of California Antidegradation Policy, and the Coastal Zone Reauthorization Amendments.

Water Code:

A nonpoint source waiver must meet the following criteria: it must not exceed 5 years in duration; it must be conditional and may be terminated at any time by state or regional board; the conditions shall include, but need not be limited to, the performance of individual, group, or watershed based monitoring; and monitoring requirements shall be designed and incorporated into each waiver to support development and implementation of the waiver program. The Board may waive the standard 13260 requirements when the discharges are in the public interest and comply with applicable water quality control plans. (Water Code § 13269.)

The Waiver as proposed essentially modifies the existing state water quality objectives. As a result, when adopting or revising water quality objectives, the Board and regional boards shall consider, but are not limited to, the factors specified in Water Code § 13241. These factors are: (a) past, present, and probable future beneficial uses of water; (b) environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto; (c) water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area; (d) economic considerations; (e) the need for developing housing within the region; and (f) the need to develop and use recycled water. The MND, Waiver and Plan fail to consider the required water quality control objectives. As such, they fail to analyze or disclose the potential significant impacts of the proposed project or adequately address mitigation measures for these impacts.

Conditions of Waiver:

Monitoring requirements must at a minimum (1) verify compliance with relevant water quality standards and (2) verify adequacy and effectiveness of the waiver's conditions. In establishing monitoring requirements, the Board may consider the following factors: volume; duration; frequency; constituents of the discharge; and extent and type of existing monitoring activities (such as existing watershed-based, compliance, effectiveness of monitoring efforts, size of project, and other relevant factors). (Water Code § 13269(a)(2).) In this context the focus of the code on monitoring requirements is important. But the Waiver, the Plan, and the MND fail to specifically prescribe any of these minimal monitoring requirements. Apparently, these documents rely on still other plans or programs to set monitoring standards and provide for how they would be implemented; but none of these documents provides specific information necessary to show that the Waiver will meet the statutory requirements. The record indicates numerous examples of where monitoring requirements have not been implemented, or where the implementation has failed, and examples are also provided by these comments. As such, the proposed Waiver is likely to have a significant impact on the environment by continuing to allow Forest Service activities that cause significant impacts to water quality, and an EIR must be prepared.

Discharges Are Not in the Public Interest:

The Waiver is not in the public interest. Regarding hydrology and water quality, the MND states that "the potential exists for covered NPS activities to result in some short term impacts to water quality" and "[w]hile some short term impacts cannot be avoided, they are considered to be outweighed by the long term benefit to watershed resources derived from restoration activities." (MND at 55.) The MND, Plan, and Waiver do not identify any of these claimed benefits nor do they fully identify or quantify the benefits that will be derived from restoration activities, and thus it cannot be concluded that any are in the public interest.

Discharges Unlikely to Comply with Water Quality Control Plans:

Water quality control plans designate beneficial uses of water, establish water quality objectives to protect those uses, and provide a program to implement the objectives. (Water Code §§ 13050(j) & 1324.) According to the "Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program." (NPS Policy) (May 2004), "[t]he beneficial use designations and water quality objectives, together with the State's antidegradation policy, constitute water quality standards for the purpose of the CWA. The water quality control plan implementation programs are required to describe the nature of actions that are necessary to meet water quality objectives, including recommendations for action by both private and public entities. Implementation programs also must include a time schedule and describe proposed monitoring activities to assess compliance with water quality objectives." (NPS Policy at 3.)

Nonpoint source control programs must satisfy these provisions: (1) the program purpose must be "explicitly stated" and be designed to achieve and maintain water quality objectives and beneficial uses, including any applicable antidegradation requirements; (2) the program must include a description of the management practices to be implemented and the process to ensure and verify proper implementation; (3) where time is necessary to achieve water quality requirements, a time schedule and corresponding quantifiable milestones to measure progress are

required; (4) feedback mechanisms must be included in the implementation program so it can be determined whether the program is achieving its stated purpose(s) or if additional or other actions are required, and (5) it shall be made clear, in advance, the potential consequences for failure to achieve a program's stated purpose and make clear that enforcement action will be taken. (23 CCR § 2915.)

Waiver Purpose is Not Explicitly Stated:

The purpose of the Waiver is not explicitly stated. The Waiver endorses a non-binding arrangement with the Forest Service to set up mere processes to perhaps implement BMPs that cannot be verified as effective in controlling pollution. Further, the Board's purpose appears to be financially instead of environmentally focused. As an example, the Waiver states that "[b]oth USFS and Water Boards have limited resources to protect water quality, and it behooves both entities to make the process for maintaining, protecting and restoring the quality and beneficial uses of water as efficient and effective as is feasible." (Waiver ¶ 5.)

The Waiver is not visibly designed to achieve and maintain water quality objectives and beneficial uses, including any applicable antidegradation requirements. In fact, the Waiver passes the Board's responsibilities and obligations for achieving water quality to the Forest Service, with a substantial amount of discretion going to Forest Service line officers, and the Board retains little ability to enforce its own water quality objectives and beneficial uses targets. As even Water Board staff recognize, individual line officers are often responding to a wide range of intense political pressures from diverse interests that benefit economically from activities on Forest Service lands. Thus, Water Board reliance on Forest Service line officers to prioritize water quality objectives fails to realistically acknowledge the competing pressures that may diminish attention paid to water quality.

The NPS Policy states that "[a]nother agency's actions pursuant to an MOU or MAA do not fulfill the RWQCB's obligation to use its administrative tools to address the relevant NPS discharges." (NPS Policy at 10.)

Description of Management to Ensure and Verify Implementation is Deficient:

The MND, Waiver, and Plan fail to adequately describe the nature of actions necessary to meet water quality objectives. In addition, the implementation programs proposed by the MND, Waiver and Plan fail to address the need for implementation of time schedules or of monitoring. As such, the negative environmental impact of the proposed Waiver is potentially enormous to overall water quality in California.

The Plan emphasizes its function as an "implementation" tool and not as a prescription for how to require any action to promote water quality. For example, the Plan states "[m]ost of this revised handbook focuses on steps to improve BMP implementation through changes in administrative practices and adaptive management." (Plan at 2.) In other words, most of the BMPs are similar standards, are not new, and therefore do not offer the public greater protection of water quality or greater efforts to comply with water quality control plan requirements.

The MND explains that one of the objectives of the Plan is "to establish a uniform process of BMP implementation" and "to incorporate water quality protection and improvement considerations….". (MND at 56.) These statements indicate that BMPs are likely to consist of "considerations of" action versus "commitment to" action. Courts have ruled that such an approach is inadequate. (*Cal. Native Plant Soc'y v. Co. of El Dorado*, 88 Cal. Rptr. 3d 530 (Cal. App. 3rd 2009).)

Time Schedule to Monitor Progress is Deficient:

The time within which progress is to be monitored under the Waiver is deficient. With respect to grazing, for example, the Waiver includes a schedule by which certain allotment management plan (AMP) analysis may occur. Annual Operating Instructions (AOIs) spell out resource protection measures and will guide the application of BMPs to allotments. AOIs, however, cannot come into existence unless an AMP has been prepared. In 2000, the Forest Service promised to give AMPs high priority. More than a decade later, many allotments on National Forest lands in California still have no AMP analysis. The Waiver, Attachment F, proposes to conduct AMPs on 324 allotments within five years; 131 of these AMPs are to be conducted by 2013. These allotments have not received AMPs in the fifteen years since the Rescissions Act; it is highly doubtful therefore that the USFS will complete 324 AMPs within five years. AMPs require extensive staff time, resources, and time for public involvement and responses to comments. Federal budgets are in decline, rather than expanding, making it even more difficult for the Forest Service to produce plans in desired timeframes. It is more likely that it will be 10 years or longer before AMPs take effect on many of the identified 324 allotments. Thus, the BMPs will not even apply to these allotments until the AMP, and the related AOI, are prepared and legally approved. For still other allotments that won't be up for renewal for years, revised BMPs have little application potential. As a result, water quality will not be restored or protected through the application of those BMPs, even assuming that unproven BMPs actually result in protection for water quality. Commenters recommend that the Forest Service agree to aim to complete all 324 AMPs within 3 years; and if the AMPs are not completed in that time frame, then the Waiver should not apply to those allotments that would be operating without an approved AMP. If an allotment in a moderate to high-use recreational area is in non-compliance with the AMP requirements, then grazing should be excluded on that allotment to protect the public from exposure to livestock generated impacts to watershed resources and water quality. Further restrictions for allotments without approved AMPs that do not contain moderate-to-high use recreational use areas could include excluding unsuitable grazing lands, limiting grazing time periods, reducing herd numbers, and reducing the length of the grazing season in the areas that do receive some low-level recreational use. (Waiver, Attachment F.)

Feedback Mechanisms Are Deficient to Determine Whether Program Achieves Purpose:

As an example of how the effectiveness of BMPs is unproven, even the general language used throughout the Plan, MND, and Waiver is indefinite and recognizes that there is no clear proof of effectiveness of BMPs. The Board cannot ensure that, because of the Waiver, the impacts to biological resources will be mitigated to less than significant by way of the BMPs. For example, the BMPs regarding aesthetics "will tend to enhance" (MND at 33), certain BMPs relate "to

preventing sediment transport") (MND at 39) and "intend" to minimize soil erosion. (MND at 44.)

The MND states "that potential impacts on the environment would be mitigated to a less than significant level through incorporation of mitigation measures discussed." (MND at 31.) The Board also claims to have laid out the "full" effects of potential environmental impacts (IS/MND at 25), and to have "extensively discussed" mitigation measures. (MND at 68.) The Waiver, however, improperly excludes certain projects from its scope, and states that:

> Projects that have a potential significant environmental impact not identified in the Initial Study, have potential significant impacts that are substantially more severe than the impacts identified in the Initial Study, or have environmental impacts that cannot be reduced to less than significant levels through mitigation identified in the Initial Study cannot receive coverage under this Waiver and will need to submit a ROWD to the affected Regional Water Board and be subject to appropriate CEQA review.

(Wavier at 23 ¶ 16 (typos original)).

Historically, regulation of the activities addressed by the Waiver has been under the jurisdiction of regional boards. The Forest Service has failed to seek waste discharge requirement approval from regional boards before authorizing these activities. The Plan does not make clear whether the Forest Service will apply new BMPs, or other new requirements to ongoing or previously authorized activities. This is a major flaw in the project because many of the BMPs currently implemented, or scheduled for implementation, have been demonstrated as ineffective.

Potential Consequences for Failure to Achieve Program Purpose, and Enforcement, are Unclear:

"Before approving or endorsing a specific NPS pollution control implementation program, a RWQCB must determine that there is a high likelihood the implementation program will attain the RWQCB's stated water quality objectives. This includes consideration of the MPs to be used and the process for ensuring their proper implementation, as well as assessment of MP effectiveness." (NPS Policy at 10.)

The BMPs in the Plan are merely non-binding "performance standards" and are inadequate, ineffective or unenforceable to control water quality consistent with California's water quality goals. This is particularly problematic as the Waiver will function as a "floor" for moderate and low risk activities that have the potential to impact water quality. (MND at 18 & 20.)

The BMPs do not bind the Forest Service. The Plan describes BMPs as follows:

> "[T]he programmatic BMPs described in this Water Quality Management Handbook are performance standards. They are neither detailed prescriptions nor solutions to specific nonpoint pollution sources. Rather, they are action-initiating mechanisms, processes, and practices that call for the development of site-specific detailed prescriptions that are designed at the project scale during planning. Development of prescriptions is aided by

results from ongoing monitoring, and may also follow direction developed at the national forests."

(Plan at 14.) The Plan thus admits that the BMPs do not even spell out what might specifically happen at the site-specific project level to restore or protect water quality. Any decision to adopt the Waiver improperly defers to a later period the adoption of specific provisions.

The Waiver acknowledges that the impacts of certain projects are not covered by the Waiver. (Waiver para. 16.) But no statute, regulation, or case defines what "substantially more severe" impacts means. Additionally, it is far too high of a threshold to ensure that a project's impact that exceeds those identified in the Initial Study will be subject to the water discharge requirements instead. Additionally, the Board's categorization of the Waiver applying to "low" ("Category A") and "moderate" ("Category B") potential impact to water quality does not help define when a project is to be subject to the Waiver, or exempt from it.

The Waiver does not apply to projects currently approved under other waivers. But the Waiver fails to identify whether those existing waivers have less stringent requirements, and if so, explain why continuation of lower standards is in the public interest and complies with the requirements of applicable water quality control plans.

The Plan states that "[a]ll BMPs are intended to be dynamic and to undergo periodic review and revisions to ensure that they incorporate the best available information and techniques." (Plan at 14.) This statement in the Plan means that the proposed BMPs are subject to change, or even may be eliminated, at any time during the five-year duration of the Waiver. As a result, the validity of any and all BMPs in the Plan is questionable, given that the Forest Service can at any time and in its sole discretion vary or eliminate a BMP. The Forest Service has a demonstrated history of refusing to follow state suggestions and/or requirements, as established by the following examples from the Stanislaus National Forest and Inyo National Forest

Stanislaus National Forest:

In the late 2000s, the Forest Service issued (and after a public comment period, approved) an environmental assessment (EA) proposing to issue long-term permits for livestock grazing on more than 70,000 acres of public lands within the Stanislaus National Forest. Several comments noted that the EA (a) did not rely on state water quality standards for pathogens, but used its own standards without providing a legal or scientific basis for the standard, and did not provide the ability to measure pathogens, (b) failed to disclose direct or indirect discharges that are controllable and that should be controlled, (c) improperly concluded waste pollution from livestock did not constitute a significant effect because the water may be treated by forest visitors to remove or deactivate pathogens, (d) lacked mitigation measures, (e) failed to provide a monitoring plan, and (f) failed to address California's NPS Policy. (Comments from the High Sierra Hikers Association (Jul. 19, 2009 and Jan. 10, 2007).) The Forest Service nevertheless approved the EA and renewal of long-term permits for livestock grazing, even though high levels of recreational use took place along streams within the project boundaries. The approval by the Forest Service and the dismissal of public objection to the failure of the Forest Service to rely on state water quality standards (and to mitigate to protect water quality) demonstrated that it will

not follow state procedures or mandates. There is no reason to believe that the instance of the Waiver will produce a different result, particularly when the Forest Service is not obligated to follow any of the BMPs, nor implement them within a specific timeframe.

Inyo National Forest:

The Plan endorses an approach of "adaptive management." (Plan at 193-208.) The Plan defines "adaptive management" as "an approach to managing complex natural systems that builds on learning – based on common sense, experience, experimenting, and monitoring – by adjusting practices based on what was learned." (Plan at 193.) The Plan does not contain key steps such as designing and implementing management measures and monitoring in accordance with scientific experimentation principles; in fact it contains no guidance as such. Instead the Plan provides practices that may be applied at the discretion of local managers. Even the Regional Boards have recognized this as a major problem in prior Forest Service practices. One example is that of the Lahontan Regional Water Quality Control Board, which is currently embroiled in litigation against the Forest Service in an effort to require it to adhere to the Lahontan Board's requirements. (*See* Lahontan Region Water Quality Control Board Comments re: Inyo National Forest Group Allotment Analysis (Jul. 23, 2010) (and accompanying documentation regarding Lahontan Investigative Order (Feb. 9, 2011) to enforce production of water quality reports, Forest Service Petition for Review (Mar. 10, 2011), and Lahontan Notice of Violation (June, 2011).)

Lahontan Regional Board Enforcement Difficulties:

The example from the Inyo National Forest is not the first time a regional board has had to instigate actions against the Forest Service to enforce state or regional water quality standards. In the late 1990's, the Lahontan Board had to issue a Notice of Violations to the Forest Service regarding its BMPs for NPS Control, and the matter was hotly debated for years. (Lahontan RWQCB letter to Forest Service (April 15, 1997) (alleging use of roads for timber removal in violation of water quality standards); Lahontan RWQCB letter to Forest Service (Aug. 25, 1999) (fecal coliform in excess of basin plan standards); Lahontan RWQCB letter and appeal to Forest Service (May 1, 1998) (wildfire reduction project failed to include mandatory, specific mitigation measures, or detailed monitoring program sufficient to detect and document violations).)

Profile of Activity Inconsistent with Water Quality Control Plan:

One example of how an activity covered by the Waiver is inconsistent with water quality control plans relates to pathogenic bacteria that enter waters from livestock grazing. Studies have clearly demonstrated pathogenic bacteria indicators within commercial cattle grazing allotments in excess of California's regulatory water quality standards. These pathogens include giardia, cryptosporidium, fecal coliform, enterotoxic strains of Escherichia coli (*E. coli*), salmonella, or other harmful bacteria (Berry et al 2006; Derlet and Carlson 2006; Mattison et al 2007; Renter, Sargeant, Oberst, & Samadpour 2003); Myers and Whited (2010) (documenting more than 100 violations in the year 2010; Myers and Kane (2009 and 2011 documenting more than 40 violations in the year 2009; U.S. Forest Service Bighorn National Forest Response to FOIA

Request Submitted by Central Sierra Environmental Resource Center and submitted to SWRCB (Jun. 28, 2011) (documenting *E. coli* concentrations exceeding state water quality standards during livestock grazing from 2005-2010); Derlet et al (2008); "Risk Factors for Coliform Bacteria in Backcountry Lakes and Streams in the Sierra Nevada Mountains: A 5-Year Study."; Derlet and Carlson (2006), "Coliform Bacteria in the Sierra Nevada Lakes and Streams: What is the Impact of Backpackers, Pack Animals, and Cattle?") Still other studies have noted excretions of steroids and hormones from livestock grazing into surface waters. (Kolodziej and Seldak (2007), "Rangeland Grazing as a Source of Steroid Hormones to Surface Waters.") In at least the context of livestock grazing as an activity demonstrably causing nonpoint sources of pollution in California, the Plan and supporting documents fail to satisfy the water quality control plan statutory requirements, and the plan is likely to have a significant impact on water quality by allowing widespread livestock grazing to take place along streams and lakes visited by high numbers of recreational users.

Through the issuance of the proposed Waiver, MND and the Plan, the Board and the Forest Service attempt to shortcut NPS pollution control requirements monitoring NPS discharges, implementing controls, and evaluating the effectiveness of BMPs. This action is inconsistent with water quality control requirements and certainly not in the public interest.

Antidegradation Policy:

California's Antidegradation Policy states:

> Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.

(State Water Board Resolution No. 68-16 ¶ 1 (Oct. 28, 1968).) The Plan and associated documents fail to demonstrate that a change in water quality that occurs because of activities addressed by the Waiver, for example range management, is "consistent with maximum benefit to the people of the State," that it "will not unreasonably affect present and anticipated beneficial use of such water," and that it "will not result in water quality less than that prescribed in the policies." With respect to range management, for example, the Plan and associated documents do not explain how contaminating fresh water sources with pathogens such as *E. Coli* well in excess of regional requirements is consistent these requirements. This is a pivotal point related in particular to livestock contamination of source streams on Forest Service lands. Before exposure to livestock, most high elevation streams have little exposure to contaminants at levels that pose risk to public health. But as shown in water studies on the Stanislaus National Forest (Myers and Kane (2009); Myers and Whited (2010)), unlike control streams that remained relatively pure, streams exposed to concentrated livestock use became contaminated at levels that exceeded thresholds in Basin Plans. The Antidegradation Policy requires that where existing quality of water is better than the quality established in policies, such existing high quality will

be maintained. Source streams above exposure to livestock consistently show extremely high water quality.

Accordingly, for consistency with the Antidegradation Policy, the Waiver and the Forest Service's Water Quality Management Plan must specify that source streams in high elevation areas of National Forest lands must not be degraded below a high level of water quality to provide maximum benefit to the people of the State. Where testing shows that such source streams are contaminated by livestock grazing or any other activity approved by the Forest Service under the Waiver, an immediate consequence needs to be prescribed to remove the source of contamination and return the stream to a high level of water quality. The current IS/MND and the Forest Service Water Quality Management Plan and corresponding BMPs all fail to address the issue of ensuring that the intent of the Antidegradation Policy is followed or what enforcement actions will be triggered by violations of the Policy.

Coastal Zone Reauthorization Amendments:

The Coastal Zone Reauthorization Amendments (CZARA) include a nonpoint source policy for coastal waters. (16 U.S.C. § 1455b.) The State of California has implemented a NPS Coastal Program, and the Environmental Protection Agency and National Oceanic and Atmospheric Agency approved it. Generally, the NPS Coastal Program must provide for the implementation and revision of management measures necessary to achieve and maintain water quality standards. (16 U.S.C. § 1455b(3).) Federal guidance for NPS pollution control requires state programs to describe the methods and measures, describe activities and locations for where each measure may be suitable, identify pollutants that may be controlled by the measures proposed and the water quality effects of these measures, establish quantitative estimates of pollution reduction efforts' effects and costs, describe relevant factors in adapting measures to specific sites and locations, and provide monitoring to assess the success of measures in reducing pollution and improving water quality. (16 U.S.C. § 1455b(g)(2).) CZARA measures must be designed to control runoff from forestry, agriculture, urban areas, marinas, hydromodification projects, and to prevent loss of wetlands and riparian areas.

Congress stated that the national policy goals of CZARA include to "preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations". (16 U.S.C. 1452(1)), and "to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development..." (16 U.S.C. 1452(2)). The MND, Plan, and Waiver are inconsistent with the CZARA.

Nonpoint Source Activities:

Livestock Grazing:

Globally, serious threats have been raised concerning the planet's drinking water supply from eutrophication of watersheds. The Sierra Nevada is not immune; deposits of substances such as phosphorus and nitrogen in the Sierra Nevada have resulted in eutrophication of much of this region, with increases in phytoplankton species and biomass. Cattle manure contains high amounts of both phosphorous and nitrogen. (Derlet et al. 2010.) One hundred head of cattle will collectively deposit 50kg of nitrogen and 25kg of phosphorus *per day* on a range (based on a mean animal weight of 400kg). *Id.* The resulting deposits promote conditions that increase bacteria, microorganisms, and algae blooms at the expense of more desirable ecosystem conditions. *Id.*

Forest Service data indicate that fewer than 40,000 head of cattle (Knudson 2010) (of the 5.5 million in California) (USDA 2011) are moved to the Sierra Nevada for summer grazing. The Forest Service charges livestock operators a subsidized rate of roughly $4.05 per cow for the entire summer/early fall season to graze on federal lands. Some ranchers may experience a cost benefit of access to inexpensive grazing land, but the long-term societal costs are high both in terms of ecological and public health risk.

California's water standards require that drinking water will contain no *E. coli* in a 100 mL sample nd that reclaimed water used to irrigate fresh produce crops contain no more than 2.2 *E. coli*/100 mL. (California Water Resources Board 2002). Myers and Kane (2009) and Myers and Whited (2010) collected Sierra Nevada water in cattle grazing watersheds with *E. coli* concentrations as high as 1,600/100 mL of water – a level that is more than 700 times as much *E. coli* as would be legally allowed for cropland irrigation with reclaimed water. Removal of pathogenic bacteria by municipal water districts is an expensive and multi-step process. *Id.* Thus, it is in the public interest to prevent incurring these costs. It is also in the public interest to assure better practices for protecting the water quality, and not to allow the interests of a tiny percentage of overall livestock operations in California to circumvent protection of public health.

The BMPs for range management are substantially similar to those in the Forest Service's 2000 Handbook. (Comments of J. Rhodes, ¶ 44.) Research and evidence demonstrates that the 2000 range management BMPs are ineffective in reducing the water quality impacts from livestock. (*Id.*) The record demonstrates that the BMPs in place have failed to change livestock grazing practices to a degree that they positively affect water quality. For example, the more than 140 violations documented in the two recent studies on the Stanislaus National Forest (Myers and Kane 2009, and Myers and Brenda 2010), plus the violations noted by the Forest Service in data from the Bighorn National forest (U.S. Forest Service Bighorn National Forest, "FOIA Response to CSERC"), are a clear indication that current BMPs (both nationally and in Forest Service Region 5) do not prevent contamination of water. The record further demonstrates that as of 2009 in Forest Service Region 5, no bacteriological water quality data was published or otherwise available by the responsible government agencies that manage these. (Myers and Kane 2011). The record demonstrates that in addition to fecal coliform contamination, the ineffectiveness of the current BMPs has resulted in stream banks being sloughed, pocked, and chiseled; meadows being heavily over-grazed; stream banks becoming shallower, wider, and crumbling; and riparian vegetation denuded. As a result, grazing has caused and continues to cause a wide range of significant effects to the water quality of California's streams, ponds, lakes, and wetlands on National Forest system lands. Existing BMPs have also failed to provide

any assurance that different, improved, and fully adequate water quality results will be achieved through the continued application of the BMPs.

The proposed Waiver and Plan do not acknowledge that current Land and Resource Management Plans (forest plans) set guidelines and standards, but they are not always implemented or enforced. As one example, CSERC over many years consistently requested Stanislaus National Forest staff to measure stream bank damage and enforce the forest plan as per the requirement to maintain stream bank stability, but Forest Service staff neither measured to identify compliance nor enforcement compliance. Instead, Forest Service staff explained that no consistent annual monitoring for compliance with the Forest Plan standard was done on the grounds that the Forest and Region lack a common protocol for monitoring stream bank stability. Thus, although the forest plan provides the standard for protection, after more than two decades, no consistent monitoring or enforcement of that standard takes place on the Stanislaus Forest. Therefore, having a clear standard for stream bank protection in a forest plan has not resulted in actual implementation, monitoring, or enforcement, and there is no consequence for violating the standard.

As noted above, the Plan, Waiver or MND fail to set any requirement that BMPs be implemented in a timely manner or at all. Further, the Plan, Waiver, and MND fail to provide any evidence that applications of BMPs (whether for range management, OHV use, or other activities) will actually eliminate degradation or water quality or reduce contamination or sediment discharges to levels that are deemed acceptable for aquatic resources and citizens of the State.

Livestock Grazing Mitigation Measures:

Instead of providing such evidence of effectiveness, the Waiver instead relies upon many of the BMPs "considered" for implementation that are commonly ineffective. With respect to range management, and grazing, the following examples demonstrate this point:

> Stock Tanks and Salt Supplements Do Not Redistribute Livestock – Contained in BMP 8.2 "Rangeland Permit Administration", this technique proposes to "[l]ocate stock tanks, salt supplements, and similar features to distribute cattle evenly over the allotment and prevent concentrations of cattle in [stream management zones] and wetlands." (Plan at 183.) Streamside management zones contain riparian areas that are essential to the maintenance and protection of water quality. (Rhodes Comments, ¶ 12.) This technique is often highly ineffective because cattle congregate in riparian zones for many reasons besides water access, including forage quality, access to water, flatter terrain, and cooler summer temperatures. (*Id.* ¶ 21.) BMPs which purport to win the challenge of trying to keep cows out of water, riparian areas and wetlands on hot summer days are outrageous and simply false; it is near impossible to keep cattle out of wet areas during times of hot weather. The cattle also rely on these streams for water, not the stock tanks outside of riparian areas. A 1,000 pound cow typically consumes about 14 gallons of water per day when high temperatures are about 80 degrees Fahrenheit; such a high rate of water consumption requires cattle to then access water sources multiple times on a daily basis, often resulting in severe bank damage to streams. *Id.* Additionally, even when stock tanks and salt supplements lure cattle from riparian areas, studies and the Forest Service

have confirmed that the result is simply to shift the location of concentrated grazing impacts which still results in greatly elevated sediment delivery to streams. (*Id*. ¶ 22.) Therefore, this technique does not prevent livestock congregation in riparian areas during warm or hot weather periods in the summer and fall.

Fencing Simply Shifts the Location of Grazing Impacts -- BMP 8.2 "Rangeland Permit Administration" proposes that installing fences *might* be a corrective action to reduce water pollution "if monitoring and periodic assessments show consistent non-compliance with permit provisions." (Plan at 184.) Fencing simply shifts the location of grazing impacts unless it is accompanied by significant reductions in both the duration of grazing and the number of livestock. Studies on Forest Service lands have confirmed these findings. (Rhodes Comments ¶ 23.) The Plan does not provide for these accompaniments, and therefore fencing is an inadequate and ineffective mitigation measurement.

Proposed BMPs Do Not Eliminate Grazing in Already Degraded Areas – The BMPs fail to include and require the elimination of summer and early fall grazing in areas with water quality problems where riparian areas have already been degraded by grazing. Water quality impacts from grazing during the summer and fall are particularly acute because grazing impacts and cattle are concentrated in riparian areas during these seasons, as many assessments, including those of the Forest Service, have acknowledged. (Rhodes Comments ¶ 28.) Eliminating grazing from these degraded riparian areas can be, when used in conjunction with other BMPs, effective; however the Plan is devoid of any requirement to actually remove (either temporarily or for extended periods) livestock from already degraded areas within grazing allotments.

Proposed BMPs Fail to Predicate Their Application on the Condition of Resources -- The BMPs fail to indicate what condition of resources they are based on; as such, their implementation cannot be determined to be either effective or ineffective with respect to preserving water quality. For example, the BMPs fail to provide clear guidance for when a no-grazing BMP is required in order to restore water quality. This is a significant defect. A no-grazing BMP is necessary under conditions such as degraded watersheds and riparian areas, certain fragile streams and wetlands, and recently burned landscapes. (Rhodes Comments ¶ 32.) The Plan fails to require a no-grazing technique for any of these referenced conditions (which are common on Forest Service lands), or provide *any* concrete requirement for when a no-grazing technique is required. (*Id.*) A no-grazing technique is the only grazing management strategy that is completely compatible with protection and restoration of riparian areas and water quality, as many assessments of grazing impacts have repeatedly concluded. (*Id.* ¶ 30.)

The Failure to Implement BMPs In a Timely Manner Will Not Protect Water Quality – A BMP must in place and functioning at the time a pollution-generating activity occurs in order to be effective. The Plan does not require the implementation of the range management BMPs by a date certain, or at specific thresholds of impact, or at all. Thus, the BMPs are inadequate and cannot be effective in abating water pollution.

Discretionary Implementation of BMPs Belie Any Implementation, and Belie Effective Implementation – As noted previously, Forest Service line officers have wide discretion regarding the provisions in AMPs, and in annual operating plans (AOPs). The AMPs and the AOPs are the primary vehicles for specifying management requirements for grazing BMP applications. The Plan proposes to now also give Forest Service line officers discretion in implementing BMPs. Such extraordinary discretion, without providing corresponding guidance, is a major failure of the Plan, as it will not ensure that BMPs are effectively implemented or indeed implemented at all.

BMP Techniques Are Unrealistic – BMP 8.2 proposes to "manage" livestock while on the allotments. What the BMP fails to recognize, however, is that most livestock permittees do not stay with their stock on the allotment throughout the summer/early fall garzing. In fact, it is rare for anyone to be up with the cattle for more than a few days before leaving the livestock to graze unattended for days or even weeks. Therefore the cattle on allotments are not "managed."

The Waiver Focuses on BMP Implementation, Not Effectiveness – The focus of the Waiver at Attachment C is on monitoring whether BMPs are actually implemented as described. The focus is not on monitoring the effectiveness or lack of effectiveness of the BMPs themselves. For example, there is no consequence for not performing field checks. The BMPs are full of nebulous concepts without specificity (*e.g.*, the "feedback loop" to revise AOIs at Plan at 182). As discussed above, the implementation of the BMPs is a serious issue because there is no timeframe or obligation on the Forest Service to implement the BMPs; however, the effectiveness of the BMPs as mitigation measures is a required component of the condition of the Waiver and forms the basis for all perceived assurances that water quality will be legally protected as mandated. Thus, to have monitoring focus on implementation of the process action (the BMP) rather than on the actual result as it relates to water quality is a grievous flaw in the Waiver process.

Livestock Grazing Monitoring:

The monitoring proposed by the range management BMPs is not adequate to address the activity's potentially significant impacts to water quality, or to assess whether the BMPs are properly implemented, or to measure or monitor whether the BMPs effectively reduce the activity's water quality impacts. The monitoring proposed by the range management BMPs furthermore is inadequate for improving BMP effectiveness in reducing water quality degradation consistent with water quality goals. Both of these inadequacies are exacerbated by the fact that (i) the discretion to implement BMPs (whether they are ineffective or effective) lies with the Forest Service line officer, (ii) there is a failure to require consistent and timely implementation of the BMPs, and (iii) the decision to implement effective BMPs is not based on an actual resource condition (which is necessary because the effectiveness of a BMP can vary according to the condition of the resource). (Rhodes Comments ¶ 42.)

Limiting Forage Utilization and/or Stubble Height Does Not Set Targets and Does Not Address Other Reasons For Height Measurements – The Plan recommends setting and measuring limits for forage utilization and/or stubble heights as a key monitoring

technique intended to protect water quality and watershed conditions. (Plan at 180, 183.) Yet as proposed, this technique is inadequate for the purpose of protecting water quality because (a) it does not provide a quantitative limit for forage utilization and stubble height that is directly tied to water quality, (b) forage utilization and stubble height only relate to grazing of a single target species of vegetation along a short transect, (c) forage utilization measurements do not address trampling which can cause considerable stream bank damage even at low levels of utilization, and (d) even if forage utilization limits are set at protective levels, studies have shown that forage utilization and stubble heights have limited ecological relevance to livestock contamination of water quality, especially through fecal coliform contamination. (Rhodes Comments ¶¶ 25-26.) The use of forage utilization measurement as a water quality protection technique is not an effective BMP.

Proposed BMPs Fail to Require an Assessment of Resource Conditions Before Allowing Grazing to Continue, Thereby Decreasing BMP Effectiveness Monitoring – The BMPs do not require any assessment of resource conditions (such as the condition of riparian areas, stream shade, channel width and depth, bank stability, bank damage from trampling, the extent of overhanging banks, water temperature, and fine sediment levels in streams). Typically, an assessment may occur during an allotment management plan (AMP) NEPA process, but this is sorely inadequate because such a process occurs at an exceedingly sluggish rate, the Forest Service does not currently meet its own schedule, and a significant number of allotments will not undergo a NEPA process for many years. (Rhodes Comments ¶ 35.) A thorough assessment is required to (a) determine whether the BMPs currently being used are effective, (b) how to tailor current BMPs to existing conditions, and (c) determine in the future whether the proposed BMPs are effective. Without such a provision, the proposed BMPs are inadequate and ineffective.

USFS Monitoring Under Current Requirements Has Not Been Performed – CSERC conducted a two-year study of the Stanislaus National Forest and concluded that *no* water quality monitoring during that time period was done to State testing protocols by the Forest Service, the State, or Regional Water Quality Boards within the Stanislaus National forest. (Myers and Kane (2009); Myers and Whited (2010)). Similarly, over the 21 years of CSERC's existence and engagement in the issue of livestock grazing and resource impacts on the Stanislaus National Forest, no consistent water quality testing of streams associated with high levels of livestock use has ever been done except by CSERC. As no monitoring or water quality testing has been done over so many years of allowed grazing activity, it is impossible to measure changes over time and against the standard of LRMPs, especially when the forest plans themselves have not resulted in even consistent monitoring of indirect livestock impacts on watershed resources – such as forage utilization monitoring.

Even for that mandated, required forage utilization monitoring, the Forest Service has openly acknowledged to the interested public that it does not have the funding or personnel to actually measure utilization in all grazing allotments each year. Therefore in many recent years the Forest Service has relied on self-interested and clearly biased permittees to self-report for 60%-70% of the allotments in the Stanislaus National Forest and on many other national forests of the region. In relying on permittees to self-monitor

whether or not their cows overgrazed specific grass species (such as carex integra) along often unmarked transects in large meadow complexes, there are also inherent problems of training and understanding of the protocols. Yet continued monitoring of forage utilization continues to be the most direct form of actual monitoring for range impacts to water quality or resource values based on BMPs in the Plan.

Proposed "Compliance and Effectiveness monitoring" Efforts Are Inadequate -- The Plan proposes six monitoring methods. (Plan at 176). The example of utilization monitoring is problematic in that it is limited to only a few scattered key meadow transects that may or may not even be representative of the resource conditions across most allotments. Utilization should, but does not, also look at impacts on wildlife, scenic values, plant diversity, soil, water quality and forage utilization. This proposed monitoring is also extremely limited because it only looks at whether cattle consumed more or less than 40% of a single grass species, and only looks at an approximate 100-foot transect of an allotment that is composed of thousands of acres. Also, the appropriate method of utilization monitoring is debatable; due to insufficient personnel and limited ability to monitor so many allotments, the Forest Service often measures the ungrazed height of key vegetation species at the end of the season, therefore getting a lower utilization rate than if the ungrazed grass heights measurement were taken along the transect at the beginning of the season before the majority of grasses are grazed. Thus, even for the only real value that forage utilization monitoring provides (the percentage of a target grass species that is consumed along that one limited transect), the inability of the Forest Service to take ungrazed height measurements early in the season can substantially skew the results and deviate from similar monitoring that actually takes early season measurements.

The Mechanisms for Obtaining Monitoring Feedback to Assess Grazing Impacts on Water Quality, and BMP Effectiveness Are Infeasible and Inadequate – The Waiver, Attachment C, states that stream monitoring locations for assessment of pollution and beneficial use will be "representative" (Waiver Att. C at 3), however the Waiver lacks any information regarding the number of streams that must be monitored, or how selection of the reaches to be monitored will be selected in order to be "representative." Without this information, the BMPs are inadequate because the monitoring cannot be "representative." At a minimum, BMPs should establish indicators of use by potential sources of contamination and set thresholds to consider, establish, review, identify and assess information. Developing "representative" monitoring for all of the Forest Service lands in California is a daunting task due to the diversity of landscape, limited budgets and personnel. It is highly likely that such a proposal is therefore infeasible. What is more likely is that, as the Waiver itself also acknowledges, "monitoring will be restricted to a relatively small number of watershed and sites." (Waiver at 2.) Furthermore, even with a restricted number of streams to monitor, neither the Plan or Waiver clearly require targeting streams and watersheds for monitoring that are most sensitive to degradation from grazing. (Rhodes Comments ¶ 49.) This is a pivotal point that was discussed with the Water Board staff at length during the Stakeholder Committee sessions in 2010. Unless the Waiver and the Plan focus monitoring on waters and locations where there is the greatest potential for degradation and violations of Basin standards, then areas with

the highest risk may easily go without monitoring or detection of high levels of contamination. Waters adjacent or downstream from concentrated livestock use, or high levels of dispersed camping, or concentrated use by off-highway vehicles or other locations with high risks are precisely the stream areas that require the most extensive monitoring. Therefore the very limited monitoring data that may be generated from the minimal water testing proposed in the Waiver cannot possibly yield information that is "representative" of water quality effects on millions of acres of Forest Service lands.

Moreover, the Waiver Attachment C fails to include a clear mechanism that requires monitoring information be used to replace ineffective BMPs with effective BMPs, and to do so in a timely manner. (Rhodes Comments ¶ 57.)

Monitoring Proposed is Premised on Non-existent "Pristine" Watersheds -- The Waiver, is partially premised on monitoring streams in "pristine" watersheds. (Waiver Att. C at 2.) Such conditions may not exist in many biophysical settings or ecotypes due to the pervasiveness of livestock grazing. As such, the proposed monitoring is unlikely to provide a sound assessment of the effects of grazing on beneficial uses.

BMP 8.2 Purports To Rely on Administrative Measures, Monitoring, and AOIs to Protect Water Quality – As mentioned previously, the Forest Service does not monitor for water quality with tests consistent with Basin Plan protocols, and the agency allows allotments to operate even when Forest Service personnel are precluded for various reasons from doing any actual monitoring in an allotment in a given grazing season. When annual range management monitoring is done (separate from long-term trend monitoring), in most cases the agency neglects to look at impacts to stream stability, riparian vegetation monitoring, or many other impacts above and beyond the matter of forage utilization. Any *E. Coli* monitoring to be done in the new monitoring program is inconsistent with state water quality sampling protocols, and therefore it will be impossible to determine if Basin Plan thresholds are violated. To overcome this hurdle, it is recommended that all plans, standards and guidelines related to livestock grazing and water quality monitoring be implemented fully by agency staff, and not by livestock permittees. Additionally, forage utilization monitoring should be completed annually by the Forest Service in all allotments where grazing is active to measure for compliance at the minimal transect areas specified in management plans. If utilization targets are not met, administrative action such as reducing livestock numbers or further restrictions should be applied the following year. If the Forest Service cannot satisfy this minimal level of monitoring for range management activities that are so widespread and that affect so many streams, lakes, ponds, seeps, fens, and other waters in the State, then the Waiver should require that allotments that do not have Forest Service monitoring for two years in a row shall be dropped from the Waiver, or that the Forest Service agree with permittees to incorporate restrictions that will significantly reduce the potential for livestock to contaminate waters.

Project-Triggered Monitoring Fails to Account for Grazing Impact – The proposed project-triggered monitoring focuses on watersheds that are "at or above the Thresholds of Concern for cumulative watershed effects." (Waiver Att. C at 4.) The cumulative effects methods used on Forest Service lands in California does not take livestock grazing

into account in assessing whether watersheds are at or above "Thresholds of Concern." (Rhodes Comments ¶ 51.) As such, the proposed project-triggered monitoring will ignore many grazing activities on Forest Service lands that are significantly degrading water quality. Such an approach renders the proposed monitoring completely meaningless and ineffective.

Proposed Monitoring is Defective Because It Excludes Livestock Exclosures – Livestock exclosures in grazing allotments must be included in the monitoring scheme in order to adequately and effectively assess the effects of grazing on riparian areas, water quality and aquatic objectives. Exclosures are essential to include in the monitoring process because (a) they provide a reference for comparison of grazing versus no-grazing on reach-level conditions that affect water quality, (b) they provide means of assessing the effectiveness of BMPs for reach-level conditions that could affect water quality, and (c) they are critical to monitoring conditions and trends to assess whether grazing complies with Forest Service standards and objectives (which the Forest Service acknowledges are part of the BMP approach for grazing). (Rhodes Comments ¶¶ 52-55.) Without fencing, it is impossible to manage stock and prevent further degradation.

Enforcement is Discretionary – If a permitee violates the conditions of a permit, a Forest Service line officer "may" take action based on certain guidelines. There is a lack of trigger events and thresholds to activate any action. Similarly, there is too much flexibility and discretion to assure that a significant violation will actually result in enforcement and prosecution of violations. The BMPs do not include a requirement to take any action, to demonstrate a BMP's effectiveness, or to monitor, report, or use results to provide consequences for violators. Historically extremely few administrative actions have actually been taken in comparison with the number of allotments.

Livestock grazing under the weak, nebulous, and inadequate BMPs for range management will have significant effects on the environment. As a result, an EIR must be prepared.

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Off Highway Vehicles:

The MND acknowledges that OHVs are the most rapidly increasing source of sediment discharges on Forest Service lands that can increase soil erosion, concentrate and divert surface runoff, and damage stream banks. The Plan states:

> Over the past few decades, the availability and capability of off-highway vehicles (OHV) have increased tremendously, as has the intensity of OHV use on NFS lands. While these vehicles have provided new recreational opportunities and access to otherwise remote locations, this increase in OHV use has the potential to impact water resources. OHV use near water bodies, particularly at stream crossings, has the potential to: Deliver sediment, particularly during storm events Cause vertical and lateral erosion of stream channels Destroy or weaken riparian vegetation, compromising stream-bank stability and increasing water temperature Pollute waters with petroleum and chemical products and other organic and inorganic waste, including human pathogens.

(Plan at 110.) Similarly, numerous studies demonstrate the potential for these impacts to occur from OHV riding. (Coe 2006; Foltz 2006; Foltz *et al.* 1990; Luce 2002; Luce *et al.* 1999; McDonald *et al.* 2004; Welsh 2008; Ziegler *et al.* 2001.)

The Wavier relies on the Plan and BMPs to avoid ongoing significant water quality impacts from OHVs. However, the MND does not provide an adequate analysis of how this proposed regulatory structure will avoid significant impacts. In particular, the MND does not provide enough information to evaluate how significant water quality impacts from OHVs can be avoided in the future through reliance on the WQMH and BMPs.

At the outset, the MND does not accurately describe the environmental setting of or for OHVs. CEQA requires a full description of the environmental setting in which the project will occur. Here, the environmental setting is not adequately described in a number of respects. First, the MND does not provide any information about the extent of existing OHV use on roads and trails in the National Forests, except to state that OHV use is increasing or that recreational activities include trails designated for OHV use. (MND at 25.) This lack of information is significant because, as discussed below, the BMPs rely extensively on new guidelines for planning and constructing *new* OHV trails as a means to avoid significant impacts in the future. However, the MND fails to discuss or acknowledge the substantial number of roads and trails that have already been approved for use the last several years on all the National Forests in California.

A review of recent Travel Management Plans (TMPs) approved by the Angeles, Cleveland, Eldorado, Los Padres, Mendocino, San Bernardino, Inyo, Klamath, Lassen, Shasta-Trinity, Modoc, Plumas, Tahoe, Stanislaus, Six Rivers, Sequoia, and Sierra National Forests shows that existing roads and trails approved on Forest Service lands since December 2008 total approximately 47,462 miles, with thousands of miles of new trails and routes added to the system, most of which were previously unauthorized or resulted from past illegal OHV use. The MND does not provide any information about how many miles of this extensive system constitute roads in the M-2 classification (high clearance, unpaved) or trails too narrow for road classification, all of which are used by OHVs. However, without this information, the public is not provided any information about the extent of the existing problem, namely that considerable OHV travel is now occurring on existing routes that are unaffected by most of the BMPs, which are largely designed for planning and designing new routes.

Second, the MND provides virtually no required discussion of the number of OHV road and trails that are officially closed, including roads designated M-1 and numerous trails created by past illegal use that have not been authorized by the TMPs. This system is also extensive, yet it is not mentioned at all in the MND. The MND also provides no information about the Forest Services past ability to keep OHV users off these closed roads and trails. There is no discussion of the Forest Services enforcement capabilities, its budget or plan for enforcing penalties against illegal OHV use or the degree of success such enforcement has had in the past. Instead, the MND states that the Forest Service is required to close undesignated roads and routes to any further public use by motorized vehicles. (MND at 8.) This provides the false impression to the public that closed routes, unauthorized trails and illegal riding will not be a source of water quality impacts when the evidence demonstrates that this is not the case. Just as the MND does not address this issue, the BMPs likewise provide no set of standards for how these impacts will be avoided.

Third, the MND provides no information about how the Forest Service will be able to fund road and trail maintenance and, just as importantly, the relocation and/or closure of problematic roads and trails on steep erodible slopes above watercourses. Instead, the MND states that: "[m]any of these roads are in poor repair, contributing significantly to sediment discharges, and USFS does not have sufficient funding to provide the necessary road maintenance." (MND at 8.) The Forest Service's lack of available funding for road and trail maintenance, repair and relocation is well documented in the environmental review documents prepared for the various TMPs on the National Forests. These documents acknowledge a funding shortfall for road and trail maintenance and repair, yet the MND does not address how this shortfall will affect the Forest Services ability to ensure that the thousands of miles of existing OHV roads and trails that present a threat to water quality will adequately maintained or rerouted to avoid significant effects.

The MND also presents no information about how the Forest Service has in the past addressed the problem of OHV trails and roads that have posed a threat to water quality. Evidence submitted demonstrates that in many cases, the Forest Service has simply ignored indisputable evidence of substantial sediment discharge caused by OHV roads and trails for years due to either a lack of funding, staffing or initiative. (*See* Collins, Schambach, Buckley Comments & exhibits attached.) As discussed below, this evidence raises a substantial question how proposed mitigation as set forth in the BMPs can be successful, yet there is no responsive discussion in the Waivers project review documents.

Fourth, the MND provides no information about the Forest Service's past ability to actually implement effective repair, maintenance or relocation of trails and roads in response to notice that a route is causing a significant sediment discharge. As discussed below, the evidence suggests that many routes, particularly those on steeper slopes are difficult if not impossible to maintain or repair to a state where significant water quality impacts will be avoided. Yet the MND provides no discussion about the Forest Services past efforts and success or failures to mitigate the ongoing water quality damage.

Fifth, the MND provides no information regarding the existing condition of OHV roads and trails, and whether they pose a threat to water quality. This information should be available based on the Schedule G-Y-R Trail Condition Monitoring forms that every National Forest is required to use in order to be eligible for state OHV funding. (*See, e.g.,* El Dorado National Forest summary monitoring, Attachment B to 2010 Soil Conservation Plan.) Yet the MND provides no discussion of this information nor does the State Board process provide any access to this information in any of the project review documents for the Waiver.

The G-Y-R monitoring information would provide necessary information about the extent of existing trails that have either a yellow or red rating, both of which identify route conditions with the potential to discharge significant amounts of sediment to watercourses. The failure to present this information leads to an environmental review process that understates the magnitude of the OHV threat to water quality and fails to disclose the monumental challenge facing the regulatory agencies in avoiding significant impacts from OHVs in the future.

Next, the MND does not adequately describe the project in the context of OHVs. First, the MND fails to explain how the Waiver will apply to OHV activities that are discharging significant amounts of sediment to watercourses. As discussed above, the Wavier is undefined because it purports only to apply to activities that have insignificant impacts on the environment. No explanation is provided in the MND as to how this approach would apply to OHV activities, the significant impacts of that are purported to be avoided by the Forest Service implementation of the Plan. The MND should acknowledge at the outset that the Waiver proposes to exempt all OHV activities from waste discharge requirements. The failure to provide this information violates the public disclosure purposes of CEQA.

Second, as to OHVs, the MND does not provide adequate information about how the Plan and BMPs propose to regulate OHV use. No information is presented, for example, about how the Forest Service will 1) identify which OHV routes are threatening water quality; 2) determine whether closure, rerouting or maintenance, and which type of maintenance will be implemented; 3) enforce existing and future prohibitions on OHVs riding in closed areas or off trail; or 4) accomplish necessary mitigation with limited funding and staff in the future. The details of how BMPs will be implemented in a way that avoids significant water quality impacts is wholly lacking from the MND or any of the other project review documents.

The MND also does not provide adequate information about the BMPs that are proposed to avoid water quality impacts from OHV use. Instead, the MND simply asserts that the BMP mitigation can be effective to avoid mitigation. However, as discussed in the Collins Comments, many of the proposed BMP mitigation measures are either ineffective in avoiding OHV impacts or are only effective for certain types of trails on moderate gradients. Nowhere in the MND or project review documents is clear information presented how the BMPs will effectively prevent water quality impacts from OHVs.

Next, the MND does not accurately characterize the OHV baseline for purposes of impacts analysis. Instead, the MND describes existing OHV use as part of the baseline for purposes of environmental analysis:

> Because the proposed project does not involve increasing the use of recreational facilities, and may allow minor construction or expansion of recreational facilities which would be conducted pursuant to USFS Guidance and the USFS WQMH, the appropriate finding is less than significant with mitigation.

(MND at 64; *see also* MND at 61 (existing OHV uses are part of the environmental baseline.) This baseline characterization is inaccurate in that it portrays the adoption of the Plan and BMP regulatory approach as a project that will not have *additional* adverse effects because the existing effects of OHV riding is already significant. This characterization is flawed, however, because OHV riding must comply with the Water Code and thus the alternatives for future OHV riding do not include OHVs on Forest Service lands that are essentially unregulated by the State or Regional Water Boards. Instead, OHV use must comply either with 1) waste discharge requirements; or 2) a waiver that meets the requirements of Water Code 13269. To the extent that the Board proposes a waiver that may lead to significant future indirect water quality impacts by allowing the substitution of an agency's regulatory program in place of WDRs, CEQA requires an EIR to be prepared.

Next, the Waiver proposes that significant future water quality impacts from OHVs will be avoided through the application of the Plan and BMPs, which have been specifically drafted for OHVs. After reviewing the Plan and BMPs, however, the evidence demonstrates that significant impacts could and in fact are likely to occur in the future. The discussion below raises issues that should have been presented by the Board as part of an EIR process, in which proposed regulatory alternatives were evaluated. In particular, with respect to OHVs, an EIR would have allowed the public to consider a regulatory alternative to the proposed BMP system that would offer specific threshold standards for how OHV routes would be regulated and closed where significant impacts were continuing to occur. The BMPs proposed for this project do not provide these specific standards, and thus have the potential to contribute to water quality impacts that should have been addressed in an EIR.

Next, the BMPs for OHVs do not ensure that significant impacts will be avoied on existing routes that have the potential to contribute significant effects. As noted, recent Forest Service TMPs authorize over 47,000 miles of roads and trails, many of which are utilized almost exclusively by OHVs causing significant sediment discharge into watercourses and otherwise harming beneficial uses by degrading stream and wetland habitat. (Collins, Buckley, and Schambach Comments, and exhibits.)

The BMPs for OHVs also improperly fail to require closure or relocation of routes that are causing significant effects to water quality and beneficial uses. Many existing OHV routes will inevitably discharge large amounts of sediment to streams due to their close proximity or creation on steep erodible slopes. For these type of trails, typically created, either legally or illegally, without consideration of water quality impacts, there is often no practical, feasible mitigation that can ensure that significant sediment loads are not discharged over time. (Collins Comments.)

Nowhere in the BMPs is there any information about what amount of resource or trail damage, either

qualitatively or quantitatively assessed, or volume of sediment entering channel, would trigger closure. As a result, there is no standard that would ensure that significant water quality impacts will be avoided. The lack of any standard for closure or relocation has the potential for significant impacts because the evidence demonstrates that in the absence of any defined standard, the Forest Service will not choose to close or relocate routes, despite clear notice that such routes are causing significant sediment discharge. This can be seen in photos of routes discharging sediment to downstream watercourses, which were not closed despite the Forest Service's having received notice of ongoing adverse effects. (Collins, Schamback, and Buckley Comments, and exhibits.)

This problem is further illustrated by the Forest Service's own monitoring protocols, referred to as "Schedule G-Y-R Trail Condition Monitoring" to identify high risk trails. Under the GYR monitoring system, trails rated "red" are described as having "excessive erosion" discharging to watercourses. Steep approaches to streams are rated red where there is evidence of "accelerated erosion." The photos reviewed by Collins depict trails that meet the descriptions warranting a red rating based on their excessive erosion and potential for substantial adverse impacts to water quality. However, no closure or trial rerouting has occurred for any of the trails depicted in the photos.

The result of continuing operation and no closure is likely to occur in the future because the BMPs do not actually require any action to be taken based on any measurable standard. Instead, the Forest Service allows for trails identified as "red" condition to be continually operated, while it considers various maintenance or mitigation options. To avoid significant water quality impacts, a "red" condition due to excessive erosion to a watercourse should trigger a specific management response such as immediate closure. Instead, trails meeting the "red" criteria under the Forest Service's own monitoring protocols may continue to discharge significant amounts of sediment into nearby watercourses, leading to significant impacts on water quality. Nothing in the BMPs avoids this foreseeable result in the future.

Next, the BLM mitigation is discretionary and prioritized based on available staff and funding.

The OHV BMPs in the Plan state that based on this monitoring, the Forest Service shall take "immediate corrective action" for "adverse water quality effects" or where there is a "potential for substantial adverse impacts to water quality." (Plan at 122.) However, the BMPs do not provide any timetable for taking any action. Instead, they merely require the Forest Service to prioritize mitigation measures that *could* be applied to prevent or repair water quality damage. (Plan at 114.)

Further, the BMPs do not provide any information about how prioritization is done and what the criteria are for prioritizing. However, it must be assumed that prioritization will be determined in whole or in part by the availability of funding and staff to carry out maintenance or road or trail closure or rerouting, or lack of it. (Collins Comments.) In addition, the Forest Service will measure priority for closure will against the recreational interests of OHV users. This raises the potential for significant impacts because, as the evidence demonstrates, the Forest Service lacks adequate funding to ensure adequate staff and oversight for trail closure, required maintenance and enforcement. (*See* Buckley & Schambach Comments, and exhibits) Further, where routes are popular, the evidence shows the Forest Service consistently failing to take necessary action, despite the ongoing adverse water quality impacts. As Collins notes:

> Certainly funding, staffing and other similar factors must weigh in the decision process in

> "prioritizing" mitigation, yet these factors are not discussed and ranking order of priorities is not provided. As discussed above, the photos show that many problematic trails are neither closed nor mitigated for long periods of time. Where funding and available staff act as a roadblock to fixing identified problem areas, the BMP effort will continue to fail and water quality will continue to be degraded. This is a significant issue that should have been discussed in the review documents.

(Collins Comments.) The MND and BMPs lack any substantive or coherent discussion of this critical issue. Here, the Forest Service has an acknowledged history of being unable to oversee and correct the actual impacts of OHV riding due to lack of staff, funding or political will. Thus, the MND must discuss and evaluate how the BMPs will change this result. Instead, the only mention in the MND is the unsupported assertion that the Forest Service will be required to close any trail for which adequate maintenance funding is lacking. This assertion does not refute the substantial evidence showing how the lack of funding leads to unmaintained roads and trails, or allows problematic routes discharging significant amounts of sediment to stay open for years if not decades due to lack of funding or available staff to attend to the problem.

Next, the evidence shows that the BMP mitigation proposed for OHVs may be ineffective to avoid significant water quality impacts. As Collins notes, the mitigation measures proposed are not likely to be effective in preventing sediment discharge from OHVs. For example, "hardening" and "water bars" are relatively ineffective in preventing substantial sediment discharge from continuous OHV trail usage on steeper slopes. Rolling bars can be more effective, but 1) are expensive and technically difficult to install due to the need to create a compacted soil bar that is resistant to OHV riding; 2) are ineffective at gradients over 25%; and 3) require continual upkeep and maintenance, which becomes problematic for longer trail sections at a time when funding and staffing are being reduced, as discussed above.

For water crossings, other mitigations such as bottomless arches or buried pipe-arches may actually increase sediment discharge over time. (Collins Comments.) In addition, the BMPs recommendations for watercourse mitigation in areas with naturally high water tables, permeable fills, perched culverts, and/or culvert arrays to maintain hydrologic functions are likely to cause damages to the vegetation community and wetland resources because the road prism, even with associated drainage structures, will not drain or move water across the wetland at a similar fashion or rate that was done prior to the road or trail crossing. In some cases, the lower portion of the wetland will have water completely blocked from it from clogged or damaged drainage structures, causing a new drainage course to form, or alternatively, cause flow to go over the road, causing the road to wash out and deliver further sediment to the wetland. (*Id.*)

Similarly, the mitigation to design watercourse crossings "for a 100-yr storm event to allow for unobstructed flow including bed-load and organic debris, and to provide for passage of desired aquatic and terrestrial organisms" is unlikely to avoid significant impacts because 1) there is inadequate data available for actual 100-yr bedload transport at most OHV stream crossings making it nearly impossible to know whether the crossing has been properly designed for such a quantity of bedload; 2) volume of bedload and its transport characteristics can have a broad range of variability both spatially and temporally; and 3) random upstream events such as landslides and woody debris jams can release unpredicted amounts of sediment as a sudden surge during common flow events that happen much more frequently than 100-yr recurrence interval events, which phenomena is simply not accounted for in the

mitigation. (*Id.*)

As discussed, the MND and BMPs lack any discussion of the relative efficacy of the proposed mitigation measures as applied to avoid sediment discharge from OHV routes on Forest Service lands in California. As Collins notes:

> If the BMPS are effective at preventing sediment supply, the review documents should refer to some quantitative measurement that the sediment storage behind waterbars and dissipation structures equals the same volume of soil lost from the erosional voids made from raindrop impact, and rills and gullies on the OHV road and trail tread as well as the side slope gullies formed at the dissipation structures off the edge of the road. In my opinion, the reason this type of information is not presented is because these type of BMP mitigation measures proposed for OHV roads and trails do not avoid significant sediment discharges. As a result, there appears to be no consideration of how effective these measures have been in the past at avoiding significant sediment pollution from OHV routes. In sum, the assumption implied in the review documents that these impacts can be avoided by the proposed mitigation measures is not evaluated or supported and in my experience is unwarranted.

(Collins Comments.)

Next, the Forest Service's inability to control OHV riding on unauthorized trails has the potential for significant water quality impacts. And yet neither the MND nor the BMPs addresses the adverse water quality impacts of OHV riding on closed or unauthorized trails. Instead, the project review documents all assume that the closure of a trial or road will ensure that no new water quality effects will occur. Unfortunately, this assumption is entirely unwarranted. The evidence shows that unauthorized trail riding is a potentially significant source of sediment discharge and that routes that are officially closed according to the adopted TMP for the Forest are rarely if ever signed as such so as to provide the necessary notice to OHV riders. (Schambach and Buckley Comments.) The Plan's failure to provide appropriate signage and adequate funding and staffing to enforce prohibitions against illegal trail riding has the potential for significant impacts since it allows riding to occur on trails that are unmaintained and not designed in any way to avoid sediment discharge to waterways. And the failure of the MND to discuss or in any way present this issue as part of the environmental review process violates CEQA.

Next, the BMPs for OHVs have the potential for significant impacts, in part because they allow for future trails to be constructed on steep slopes. Even for new routes, the BMPs allow for OHV trails on slopes up to 55% steepness, or 45% where the erosion potential is high or extreme. This standard does not ensure that significant impacts to water quality will be avoided. In fact, several of the photos demonstrate how OHV trails on a significant slope create their own drainage channels, which in turn feed sediment directly into downslope watercourses. The gradient of the slopes depicted in most of the photos are *substantially less* than 45-55%. As Collins notes:

> In my opinion, allowing for new trails to be constructed on erodible soils above 15% gradient has the potential for significant water quality impacts due to sediment discharge. Further, in my opinion, it is not clear how the Forest Service could propose that placing trails on "highly erodible" slopes - whatever gradient - will not have significant impacts to water quality. Highly erodible soils will break down with OHV use and the resulting sediment pollution will flow

> downhill during storm events and inevitably discharge to lower elevation watercourses. In my opinion, any OHV riding on highly erodible soils with a significant gradient has the potential to lead to significant impacts, which do not appear to have been considered in the review documents for the proposed waiver.

(Collins Comments.)

Next, the monitoring provisions for OHVs do not avoid the potential for significant impacts, and do not comply with the Water Code. The monitoring BMP proposed for OHVs (Section 4.7.5) is also not adequate to avoid significant water quality effects from OHV activities.

The BMPs largely rely on the "Schedule G-Y-R Trail Condition Monitoring" to identify high risk OHV routes; this is to occur annually for high risk areas, and every three years for all trails. This monitoring approach is inadequate for several reasons. First, as discussed above, the OHV trail Monitoring Form (GYR) states "trails rated red are to be repaired or closed within six months." (*See* Collins Comments.) However, waiting for a period of 6 months allows water quality degradation to continue with no immediate abatement of the condition. The failure to immediately close OHV routes rated as "red" has the potential to allow for significant continued sediment discharge and thus significant impacts.

Second, the monitoring does not requires any particular action to be taken by the Forest Service in response to the a finding that a trail is causing excessive erosion and should therefore be rated as "red." In practice the Forest Service's response to "red" rated trails appears to be to schedule maintenance activities for some time in the future, but not to close or reroute the trail. (*See* Collins Comments.) Thus, although the BMPs state that the Forest Service *may* close routes that pose immediate significant threats to water quality, the Service does not do so despite conditions of excessive erosion - the grounds for a red trail rating. This has the potential for significant impacts because, as discussed, even the most elaborate mitigation measures such as rolling dips are difficult and ineffective on steeper slopes, and routine maintenance such as filling in ruts or creating a water bar are largely ineffective in preventing sediment discharge from OHV riding. In the meantime, the acknowledged lack of funding and staff for maintenance often pushes repairs out years if not decades. (*See* Schambach and Buckley Comments.) During this time, red rated routes will discharge significant amounts of sediment into downslope watercourses.

Third, the Forest Service has demonstrated that it may decline to issue a red-rating for steep trail segments with exposed sediment leading directly to the active stream courses. (*See* Schambach and Collins Comments.) This result is directly due to the lack of any quantitative or qualitative definitions or standards associated with what constitutes a "significant" discharge of sediment. As a result, any decision about whether closure is actually needed is not based on standards but instead is largely subjective. As discussed, neither the MND nor the BMPs provided any information about how the Forest Service has been rating its trails over the last 10 years. The Rock Creek example demonstrates that without measurable standards the BMPs can provide no assurance that the Forest Service will even identify trails causing excessive erosion as red and therefore requiring immediate mitigation. In sum, the lack of any definable threshold has the potential for significant water quality impacts, given the Forest Service's apparent preference for keeping these high risk, "red" rated routes open for continuous OHV use.

Finally, the Forest Service's ability to take action based on monitoring will depend on available funding and staffing, as discussed above. If sufficient funds are not available to respond to monitoring results, significant adverse water quality impacts will not be avoided. The pattern here is demonstrated by the case studies of several trails where the Forest Service was unable to take action for years, if ever, in alleviating the continuing water quality impacts occurring due to a problematic trail. (Schambach and Buckley Comments.) Whether due to lack of identification of the problem or lack of funding or staff, the factual result on the ground has been the continued allowance of OHV operations that discharge significant amounts of sediment to watercourses.

Although the BMPs maintenance and operations section acknowledges that drainage and erosion control facilities cease to function if they are worn down by continued traffic, the BMPs do not discuss how a three year monitoring frequency for any trail not identified as high risk is adequate. Where a mitigation measure such as a waterbar fails, and a trail thought not to pose a risk becomes a source of discharge, the result would be potentially years of unabated sediment supply to streams. The potential for such an impact is demonstrated in the photos submitted with these comments.

The remaining monitoring requirements (including Section 6 of the Plan) do not appear to require specific monitoring of OHV routes that have the potential to cause adverse water quality impacts. Thus, they do not ensure that BMP monitoring will avoid significant impacts to water quality.

Next, the adaptive management provisions for OHVs do not ensure that significant impacts will be avoided. As discussed, the Plan provides for an adaptive management program that lacks specifically defined objectives as opposed to general goals based on legal standards and any measurable standards that would trigger specific action on the part of the Forest Service. Further, the Board in this proceeding has chosen not to adopt an alternative program containing defined objectives and measurable standards for action. This choice has the potential for significant impacts because it allows the Forest Service to continue the status quo of inaction despite the acknowledged significant impacts that are occurring due to the widespread existing road and trail system for which the Forest Service lacks funding or staff to effectively oversee.

The inadequacies of the Plan adaptive management strategy are highlighted by the OHV issue. For an adaptive management strategy to be successful, project objectives must be: 1) specific; 2) measurable; 3) realistic and attainable (physically and economically); 4) directly related to the problem; 5) time specific (i.e., clearly stated when and how long); 6) be tied to specific measurable success criteria. (Collins Comments.)

With respect to OHVs, this would include identifying specific objectives relating to the reduction of OHV pollution such as a measurable standard for what constitutes an OHV route discharging a significant amount of sediment and/or a specific goal of eliminating or correcting a certain percentage of those routes over a given period of time. Instead, the adaptive management strategy simply sets forth a set of planning processes, which are to ensure that a set of general goals - such as meeting Basin Plan water quality objectives -- are being met. (*See* Plan at 200.)

These adaptive management parameters do not ensure that significant impacts will be avoided as to OHVs, which, as discussed, have a *long* history of creating pollution discharges on Forest Service lands that remain uncorrected. Here, the Board's decision to adopt a standardless adaptive management

strategy does not ensure that significant impacts due to continued OHV usage of sediment discharging trails in the future will be avoided. We iterate that the Forest Service has been required to meet Basin Plan goals for decades, yet the pollution continues to occur. In the absence of any standards for action, a theoretical adaptive management procedure becomes a meaningless exercise.

The Plan also does not contain any timetable for the Forest Service to take corrective action in the event that monitoring demonstrates that OHV trails are discharging excessive sediment. This has the potential for significant impacts because the evidence shows that an OHV route may be clearly discharging excessive amounts of sediment, yet remain in operation literally for years without any enforcement. The adaptive management strategy also fails to ensure that significant impacts will be avoided because 1) the OHV monitoring section lacks definitive standards to determine the trigger for a response; and 2) the Plan fails to identify pre-defined potential management responses where a monitoring trigger is met.

For example, as discussed, the GYR trail monitoring system requires the Forest Service to identify routes that may be or are discharging significant amounts of sediment to streams as yellow or red. However, the evidence shows that the Forest Service may fail to identify trails that are clearly discharging sediment during storm events as requiring immediate corrective action under this monitoring protocol. Instead, the monitoring standard based on the identification of red or yellow trails is not based on any quantitative measures of success or failure which would then require automatic corrective action, including permanent and immediate closure of trails if targets are not met.

Further, the OHV BMPs do not provide any defined management response to the identification of an OHV route as a "red" trail discharging significant amounts of pollution. Instead, as also discussed, the Forest Service retains complete discretion as to whether or which corrective action should be taken. As a result, unknown quantities of sediment can be discharged creating significant downstream impacts. Meanwhile, the adaptive management strategy provides no consequences if corrective actions are not taken. Finally, the adaptive management strategy lacks any enforcement mechanism if sediment discharging trails and roads are left in operation, without corrective action due to lack of staff or funding.

In sum, nothing in the Plan or BMPs *require* any action to be taken, based on any measurable standard. This is precisely the process that has been ongoing with respect to OHV management over the last few decades, with resulting significant impacts on water quality. The MND provides no explanation for why the new regime will avoid significant impacts in the future. Instead, an EIR should have been prepared.

Specific Comments on OHV BMPs:

The Plan does not include BMPs for OHVs that will protect or restore water quality. As discussed, well-intended, envisioned generalities in BMPs will not result in protection of water resources if the BMPs are not enforceable, are not applicable to the vast majority of already existing OHV routes, or are actually in direct conflict with legal direction for OHV use on individual national forests.

BMP 4.7 reflects the belief of the Forest Service that despite potentially significant impacts from OHV use, "wise management of OHV use can mitigate these impacts. The purpose of this set of BMPs is to control nonpoint source pollution that may occur because of OHV recreation activities on NFS lands." (Plan at 110.) And yet for the past two decades, the conservation community has submitted detailed

comment letters during various OHV Route Designation planning processes and Motorized Travel Management public comment periods. Again and again PEER, CSERC, and other groups have identified resource damage being caused by OHV use and protested the lack of enforcement of existing regulations. During the past eight years CSERC has periodically submitted to both the Stanislaus National Forest and the Regional Office highly detailed photo reports showing major ruts and erosion created on OHV routes by dirt bikes in particular. CSERC photo comments during Travel Management comment periods have shown OHV route crossings where OHV use has caused sedimentation into receiving waters. During the Stakeholders Committee sessions held in 2010, CSERC provided the State Water Board with additional photo comments showing resource damage and water quality impacts from OHV routes as well as dirt roads that are utilized by OHVs. (*See* Buckley Comments.)

At one point the CSERC's director stood in the national forest with the Stanislaus National Forest Supervisor and the designated Forest team leader for the OHV Route Designation process that was then underway. In the Cedar Ridge forest area that was signed as closed to OHV use, multiple OHV's were riding on user created trails on an early weekday morning in direct conflict with the legal closure that was highly visible to those entering the forest. The Stanislaus Forest Supervisor shrugged his shoulders and bluntly admitted that the Forest "wasn't going to shoot" OHV riders who blatantly ignored posted signs. Both Forest Service officials admitted that there was only so much the agency could do to manage illegal OHV use and enforcement of motorized closures was nearly impossible. *See* Buckley Comments.)

Similarly, when CSERC staff met with the Stanislaus National Forest MiWok District Ranger in 2007 to protest resource damage being done by OHV riders in the Deer Creek area who were roaring up steep hillsides on user-made routes that were posted as closed, the District Ranger admitted that the Forest Service has little ability to control those who choose to ignore regulations. (*See* Buckley Comments.) And again during the Stanislaus Forest Motorized Travel Management planning process, at numerous public meetings Forest Service staff pointed out that with a very limited number of agency staff delegated to enforcement of OHV rules, the massive size of the national forest prevented the Forest Service from being able to catch OHV violators in many instances. (*Id.*) As discussed, with limited Forest Service budgets and limited staff, the Forest Service has demonstrated it is incapable of enforcing existing regulations by OHV users within each national forest. Accordingly, although some of the BMPs could potentially provide greater protection for water quality and aquatic resources if fully implemented, the reality is there is very little funding to implement these measures, as exhibited by the lack of enforcement of OHV violations. Even if these BMPs were mandatory (and they are not), many of the BMPs are unenforceable or can only be effectively enforced a small percentage of the time.

Sediment is the primary pollutant associated with OHV activity. (Plan at 111.) Discharges of sediment reflect accelerated soil erosion caused by OHV use. As written, the current BMPs for OHV use in the WQMH provide inadequate management prescriptions for existing OHV routes and no clearly triggered consequences for national forests that allow OHV use that individually and cumulatively results in excessive sedimentation to wash into receiving water bodies.

BMPs 4.7.1. – 4.7.3 are intended to prevent or reduce the risk of sediment from OHV trails that enter water bodies when individual national forests design, locate, or plan new OHV trails. But the fact remains unstated that the majority of the Forest Service's OHV system is already in existence on the ground. Therefore, many of these BMP elements are moot. If the Forest Service were starting from a

clean slate, with no OHV trails existing on the ground, these BMPs might provide a good starting point for OHV trail planning, location, and design. For instance, BMP 4.7.1 outlines the requirements of 36 C.F.R. 212 and relies upon the companion travel analysis process to satisfy planning requirements. What the Forest Service fails to mention is that nearly every forest has completed the process outlined in this regulation, and will not be engaging in a full travel planning process again in the foreseeable future. Further, no California forest actually completed a travel analysis process during its efforts to conform with the regulation.

These regulatory requirements, and any subsequent travel analysis, will only be triggered when new motorized trails are proposed and will not involve any broad scale planning of OHV routes as is implied by this BMP. BMP 4.7.1 asserts that the risk to water resources posed by OHV trail management activities can be reduced by using appropriate techniques that can be taken from a list of possible actions. Those actions include: "Plan trails to minimize the number of stream crossings avoid locations near wetlands..." The BMP prescribes: "Avoid locating new trails on slopes steeper than 45 percent where the erosion potential is high or extreme." Again, the majority of the long list of techniques only applies to new trails that the agency is actively planning to create. This is a pivotal point. Most of BMP 4.7.1, BMP 4.7.2, and BMP 4.7.3 do not apply to the vast system of already existing officially designated and user-created OHV routes that currently are in place in national forests in California.

BMP 4.7.1 has a brief section that addresses the on-going harm from existing trails that have been poorly located. However, it fails to actually require the Forest Service to take actions to fix the identified problems. The Forest Service indicates that it will "Identify trail segments causing adverse impacts to water resources" but then goes on to state that it will "prioritize mitigation measures." This is insufficient. The vast majority of existing OHV routes were never planned by the agency and no NEPA analysis was ever done prior to the routes being created. It is not new, carefully designed and NEPA-analyzed routes that pose significant risk to water quality on Forest Service lands. It is the vast system of user-created OHV routes on each national forest that never were designed or even authorized by the agency until long after they were established. (*See* Buckley Comments.)

Instead, to create such an unauthorized user-created route, dirt bike motorcycle riders and ATV riders or drivers of 4WD vehicles drove across a mountainside or up a steep slope to the top, creating a route that they or subsequent riders utilize again and again until it became an obvious user-created route. These routes are among the most ecologically harmful routes on the National Forests, and problems with existing routes must be addressed. (*Id*.) Allowing the Forest Service to "prioritize" which routes are addressed, without placing an additional requirement that they eventually address all of the problem routes, provides the Forest Service with an easy excuse to never deal with existing problems. Forest Service budgets are always strained, and while prioritization is a must in any strained budget, allowing for a permanent pass because of a lack of resources will never result in improved water quality.

For purposes of reducing water quality impacts from OHV use on national forest lands within California, all three of the first OHV-focused BMPs (BMP 4.7.1, BMP 4.7.2, and BMP 4.7.3) fail to affect existing OHV routes in any fashion. Since most national forests within California have recently completed OHV route designation during Motorized Travel Management planning processes, it is even more unlikely that BMP 4.7.1, BMP 4.7.2, and BMP 4.74 will affect even one or two percent of OHV routes on national forest lands in California within the waiver period. Most national forests have the majority of their desired OHV route systems in place and therefore are exempt from the majority of the

requirements outlined in these BMPs. In sum, the Board cannot consider any of the three BMPs as providing practices or regulatory constraints that will control nonpoint source pollution along the thousands of miles of already existing OHV routes and tens of thousands of miles of already existing dirt and gravel roads where OHV use occurs on Forest Service lands within California.

For BMP 4.7.1. alone, it is highly likely that the thresholds identified for concern in the listed elements (slopes steeper than 55 percent; slopes steeper than 45 percent where the erosion potential is high or extreme; limit steep pitches to less than 200 feet where possible) are not based on solid scientific evidence. In the experience of experts, these thresholds are not nearly low enough to reduce or eliminate significant discharges of sediment caused by erosion or bare routes that are less steep than the listed thresholds. (*See* Collins and Buckley Comments.)

For BMP 4.7.2. alone, it is a concern because certain of its elements are optional. While there may be a need to be able to adapt for "local site conditions," there are certain things that should be applied to all trails in order to satisfy the objective of this BMP to "reduce the risk that sediment originating from designated OHV trails and OHV areas will enter watercourses and water bodies." While the Forest Service admits: "Proper on-site location and design of OHV trails are essential, particularly at stream crossings," in the next breath the agency's Plan makes all elements of the trail location BMP optional by saying that managers can choose among the listed elements. For example, elements that could be used when selecting trail location include "Maximize the filter distance between the trail and the water body;" "Locate drainage structures where dispersion or absorption of runoff is effective;" and "Avoid the capture, diversion, and/or concentration of runoff from slopes adjacent to OHV trails."

It is hard to imagine why a trail should not be located to maximize filter distance, or a drainage structure should be located so that it is ineffective, or why the capture of runoff should not be avoided. There are similar elements in the trail design criteria that should not be viewed as discretionary. Further, BMP 4.7.2. appears to place a focus on meeting the "recreational objective" of trails. The quality of the environment and protection of valuable water resources should not be sacrificed to meet what is essentially a discretionary function of the Forest Service. While recreational opportunities should and are provided on the national forests, it is clearly acknowledged that the national forests cannot and should not be everything to everyone all of the time. For example, certain types of motorized recreation, such as "mud-bogging" or hill climbing, are contradictory to other essential functions of the national forest, including providing clean water for communities and wildlife.

The "need" for this recreational opportunity should not be a consideration when determining the number of water crossings. In a less extreme example, the same rationale applies to streamside trails that weave over and through watercourses. These BMPs acknowledge in countless places that sound management of OHV use near and in watercourses is one of the most important methods for reducing the impact on water quality from motorized use. Protecting watercourses from OHV impacts should not take second place to "recreational objectives" that are assigned at the sole discretion of the Forest Service and are changeable at will, with no public involvement.

BMP 4.7.3. suffers from the same fatal flaw as BMPs 4.7.1 and 4.7.2. The elements outlined, which if fully applied provide a strong framework for reducing sedimentation from watercourse crossings, are optional. A trail manager may select "the appropriate techniques from the following list, adapted as needed to local site conditions."

BMP 4.7.4. applies only to new construction and to the very small percentage of the existing OHV route system where reconstruction of a trail segment occurs on a national forest. Except for that tiny percentage of OHV routes that will be reconstructed during the 5-year waiver period, BMP 4.7.4 has no relevance to any goal to control nonpoint source pollution from use occurring on already existing routes. This BMP does not apply to the vast majority of existing OHV route segments that will not be reconstructed during the period when the waiver is applicable.

BMP 4.7.5. proposes new monitoring requirements that would shift from how OHV management and monitoring has been conducted on national forests within the Region up to this time. BMP 4.7.5. suggests: "(t)he Forest Service will schedule systematic monitoring of OHV trails, activities and effects to detect existing and probably impacts to water quality, aquatic and riparian resources. If adverse water-quality effects are occurring, or there is a potential for substantial adverse impacts to water quality, the Forest Service will take immediate corrective action." (Plan at 122.) While this BMP could be a much-needed change to Forest Service management of OHV use, as with other envisioned improvements to management direction, the evidence shows that a lack of funding and adequate staff will instread combine to hamper the effectiveness of this proposed monitoring and responsive actions.

For example, on the Stanislaus National Forest, field monitoring done by CSERC staff located a stream drainage where high levels of fine sediment were clearly being discharged from a legally designated OHV route and a blocked, but still-eroding old road segment. The Forest Service in the Spring of 2010 was formally notified of the problem including photos and detailed site-specific information. The Forest hydrologist responded that the problem was already known by the Forest Service to exist. The explanation given for no restoration work being done on the problem was that the lack of adequate funding prevented any corrective action. More than a year later, that route still remains fully open to OHV use and no corrective action has been taken. Over the extremely wet spring period of this year, significant amounts of new sediment continued to wash into the seasonal stream drainage as can be easily shown to any State Water Board representative who would like to visit the site. Thus, immediate corrective action is a well-intended vision that may not match with actual constraints that prevent such corrective actions from being done as desired. *See* Buckley Decl.; CSERC letter of April 14, 2010 to the State Water Board showing photos of this OHV route/road impact on water quality.

CSERC, PEER, and other organizations provided the Forest Service with verbal and photo descriptions about numerous other specific OHV routes that are discharging sediment into streams. (*See* Buckley Comments.) Similar to the example above, many such routes have been allowed to be open to continued OHV use without the Forest Service taking any "immediate corrective action" to fix the major ruts, water crossings, or other resource problem. Thus the Board cannot simply accept as credible Forest Service claims that that the agency will systematically monitor and take immediate corrective action as prescribed in BMP 4.7.5. (*See* Buckley Comments.)

As a further example, one of the implementation techniques in BMP 4.7.5 directs Forest Service staff engaged in route monitoring to: "Temporarily close trails that pose immediate significant threats to water quality. At a minimum, install temporary erosion and sediment control treatments prior to the winter season." (Plan at 123.) In the past, however, the Forest Service has consistently failed to close routes that pose significant threats to water quality year after year (as evidenced by numerous routes in the Cedar Ridge area as shown in the CSERC April 14, 2010 photo-comment letter). (Buckley

Comments.) Accordingly, the application of that BMP "technique" and other envisioned techniques have no way to be measured for compliance by the State Water Board. Nor is there any requirement in the WQMH for a consequence for a national forest to fail to do desired OHV route monitoring or to fail to take immediate corrective action.

Forest Service policy recommends that the Trail Assessment and Condition Survey (TRACS) be repeated depending upon the maintenance class of the trail. It seems unlikely that the requirement in this BMP that 2% of the trails be subjected to the TRACS monitoring protocol would meet these recommendations or satisfy the intent of the monitoring. Further, we are concerned that FS policy on TRACS implementation recommends the most frequent monitoring for the more developed trails, and that monitoring is itself only at a five-year interval. The most developed trails are often not the trails causing the worst water quality impacts. The less developed trails could fall through the cracks of the TRACS monitoring program if only 2% of the trails are monitored annually.

With regards to the G-Y-R protocol, we are concerned that only those trails that evidence a "red" rating with regards to watercourse crossings will receive specific attention from resource specialists. This fails to acknowledge the importance of the condition of other elements monitored by the G-Y-R protocol that might implicate water quality, such as water control, erosion off-trail, sediment traps, user-created trails, and routes on earthflows or other sensitive terrain. It also fails to recognize those trails with a "yellow" rating. Addressing a "yellow" rating when it is first discovered could be a less expensive way to prevent larger water quality problems from occurring in the future. In this section of the BMP, there is also a lack of clarity as to what the requirement below is actually referencing. It is not apparent what "Objective 2" is meant to reference. Clarification or correction is needed.

In sum, the BMPs provide inadequate monitoring and a lack of clear consequences for violations. If a Forest Service employee makes the judgment that a rutted hill-climb up a steep slope does not pose significant risk to water quality based upon his or her visit during the dry season, that judgment will not prevent sediment-laden water from pouring down that OHV route during thunderstorm events, heavy winter storms, or spring snowmelt. If no timely monitoring of existing OHV routes on a given national forest is done by trained, qualified FS staff in a given year, no identification of water quality problems on those routes will even be identified - let alone corrected. If watchdog organizations report site-specific water quality problems on poorly maintained OHV routes, but a lack of funding prevents corrective action, the problems will continue. Positive written intentions need to be tied to required monitoring and required actions when thresholds or triggers are met or exceeded.

The challenge for the Forest Service and the Board is to develop a feasible and realistic set of management practices that will arguably result in reduced risk for water resources. Yet as the above examples reveal, without clear thresholds, criteria, or ways to measure the risk of OHV routes for sedimentation, diversion of flows, or other problems, then BMPs may simply end up being quick judgments or opinions made by low-level field staff who check a box on a form. Even if those judgments are sound, the lack of adequate personnel to perform desired monitoring or the lack of funding to implement corrective actions cam make any BMP inadequate.

The BMPs completely fail to provide any assurance that unauthorized, undesignated OHV routes (that presently remain on the ground without being blocked off to prevent use) will be monitored consistently by individual national forests in order to determine if illegal use is occurring and where additional

preventative actions should immediately be taken when such illegal use is discovered. The BMPs fail to require closure of broad, general OHV use areas wherever a national forest finds that it is unable to halt OHV use on unauthorized routes within that area or wherever a national forest is unable to prevent consistent resource-damaging violations of OHV regulations on legally authorized routes. Without specific, mandated monitoring requirements to be applied to all national forests in California, and without appropriate significant consequences that would be trigger by the inability of a national forest to halt OHV-generated water quality impacts, water quality will not be protected. Without stronger monitoring requirements and consequences for violations of OHV use requirements, then any list of BMPs cannot be assured to adequately protect water quality from OHV use for the purpose of granting a waiver.

BMP 4.7.6., for maintenance and operations, is indeed "critically important in minimizing the impacts of OHV use on water quality." (Plan at 124.) However, as discussed, given past Forest Service performance, it is inappropriate for the Board to simply assume that the actions outlined in this BMP will actually be implemented in such a manner as to minimize impacts on water quality. Instead, the lack of maintenance funds and chronic understaffing will almost certainly be used as an excuse to avoid critical field evaluation after major storm events. The BMP indicates that, "to the extent staffing allows," the Forest Service will inspect potential problem trails, drainage structures, and runoff patterns. An action that the Forest Service itself acknowledges as "critically important" to water quality should not be hampered by the very real budget concerns of the agency. As discussed, the real potential for a lack of adequate Forest Service funding to support maintenance and operations of its motorized trail program must be fully disclosed and its effects on the environment addressed by these BMPs. This requires completion of an EIR to assess alternatives for action based upon differing scenarios of actual funding availability for maintenance implementation.

In the text for this BMP, the agency acknowledges that trail drainage systems may cease to function if they are worn down by continued traffic or if they deteriorate because of use, weather, or inadequate maintenance. All of the maintenance activities described in this BMP are completely nebulous as to whether or not an individual national forest will apply the optional techniques or even do route maintenance during the waiver period. While it may be argued that the listing of maintenance as a BMP makes it a requirement, in reality BMPs are simply a list of optional actions that an interdisciplinary team or line officer can choose from to apply, based on their judgment.

The three BMP "Operations" are the only actual directives that appear to actually require a national forest or district to take any action. (Plan at 126.) The first bullet item would require the Forest Service to restrict OHV travel to designated trails or designated motor vehicle use areas. Any casual visit to a national forest will reveal that the Forest Service simply has no enforcement capability to effectively restrict OHV travel to designated trails. (Buckley Comments.) Using the Cedar Ridge area on the Stanislaus Forest again as a clear example, multiple fresh unauthorized OHV routes are presently evident in many locations despite a published MVUM map restricting use to officially designated routes. *See* Buckley Decl. The Board cannot rely upon Forest Service claims that OHV use will be restricted to legal routes when the agency openly admits that it cannot halt OHV use by those who choose to ignore maps or signs.

Another BMP directive under "Operations" requires national forests to: "Close trails or restrict OHV use when the potential for sediment delivery is high or during periods when such use would likely damage

the tread or drainage features." This BMP is blatantly at odds with actual Forest Service OHV management regulations. Using the Stanislaus National Forest again as an example, the Stanislaus Forest approved a ROD for Motorized Travel Management in December 2009. That ROD established approximately 1/3 of OHV routes within the Stanislaus Forest as *fully open* to OHV use year-round without any of those OHV routes being closed seasonally due to times of heavy rainfall, snowmelt, or other periods when sediment delivery is high. Just in that national forest's Motorized Travel Management plan, the Stanislaus Forest added 37.32 miles of hydrologically connected OHV routes to the Forest's legal motorized system. Failing to close those routes during times of extremely wet weather directly conflicts with BMP 4.7.6, yet the requirement to keep many OHV routes open year-round was a basic regulation approved by the Forest and upheld by the Region.

BMP 4.7.7.: approved Motorized Travel Management plans directly conflict with BMP language to close OHV trails to traffic when soil strength is low and trail treads and drainage structures are susceptible to damage. BMP 4.7.7 requires national forest officials to use their authority to close designated OHV trails and areas to vehicular travel. "This must be done seasonally by a given date, or be based on local conditions such as precipitation, or measurements of soil trafficability." (Plan at 127.) In reality, the Stanislaus Forest Motorized Travel Management plan spells out that all lower elevation OHV routes are to be open to use year-round. This is just one of numerous examples of BMPs being written by Regional Forest Service staff who are not aware of directly conflicting and legally binding plans that are currently approved on individual national forests.

BMP 4.7.8., related to restoring OHV-damaged areas, is misleading. ERFO provides funding for repair and reconstruction of federally owned roads and trails when they are "damaged or destroyed by natural disasters over a wide area or by catastrophic failures." FSM 7730.5. These funds are available for use only when there is an emergency situation, typically where the state has declared a disaster area, and the use of these funds on decommissioning is rare, and the use for decommissioning trails even more rare

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Roads:

The introduction in the Plan on road management activities is missing a key source of water pollution: road-triggered mass wasting. When a road becomes saturated on unstable fill, the road can catastrophically fail often creating a cascade of road failures downslope (Gucinski et al. 2001). While often associated with stream crossings, road-triggered failures can occur at any point along a road where road fill is present. Many watersheds in Northern California are prone to this type of road disturbance and it can contribute large quantities of sediment pollution into streams (Madej 2001). BMPs to address road-induced mass wasting are presented on page 50, BMP 2.1, however background on the problem is absent from the introduction.

The Road Management Activities include lists of BMPs and acknowledge their importance to the Plan. Roads Management BMPs are preceded by a description of the Forest Service processes and place BMPs in context. Unfortunately, the context and planning and analysis process is also described as a BMP, which may be an administrative BMP, but it is not a water quality BMP. The Road Management Options table is helpful for seeing that some management may be related to water quality, such as closing a road or trail to use, but it's not specifically closed to restore or protect water quality. If a road were to be closed to restore or protect water quality, then the BMP would describe the criteria, such as the reason (rutting, sediment runoff, collapse (as at Woods Lake in the EDNF), and other factors. The second set of boxes - - Treatments - - appears to relate more closely to BMPs, but the table does not indicate that they are related. This section

is in need of specifics about the BMPs – distance between water bars on 12% roads, for example, or size of detention basins related to runoff volumes. The CalTrans Erosion Control Manual is a good source for the Board for good examples.

BMP 2.1: Techniques, bullet three: "Identify road segments causing or threatening to cause adverse impacts to environmental resources." We support using field-based road inventory data to identify the risk of crossing failure and road-induced mass wasting. We suggest adding the phrase "identifying the level of hydrologic connectivity" to the road inventory protocol. As mentioned in the introduction to these BMPs, hydrologic connectivity is a key source of chronic water-quality impacts from roads. While high precipitation events can lead to episodic culvert failures and mass wasting (and large amounts of water pollution), hydrologic connectivity produces chronic pollution throughout the year – including during the spawning season of many anadromous fish species.

BMP 2.6: The introduction states that "a primary reason for putting roads into Intermittent Stored Service is to reduce maintenance needs while limiting the risk of adverse effects to hydrologic function from stream crossing failures, fill failures, surface water routing, and modified drainage patterns." (Plan at 69.) We recognize the Forest Service manages these roads to be returned to service, but all road-stream culverts pose a threat to water quality if they are not adequately maintained. It is not a question of whether a culvert will fail, but when. While ensuring that the culverts are "cleaned" before storage is not a bad idea, it is only a matter of time until their function is compromised. In addition to continuing chronic erosion, the potential for catastrophic failures continues, which can have significant long-term ecological effects (Cover et al 2010). While we would support a requirement that the Forest Service "regularly perform condition surveys to monitor and evaluation the effectiveness of closure methods," this would become increasingly difficult to perform as the road grows over, and, frankly, would probably not occur because of lack of Forest Service resources or funding.

In the road storage section and in the road decommissioning section there seems to be an assumption that the practice of restoring stream crossings contributes a great deal of sediment to streams. And that this presumed impact should be carefully weighted against just leaving the culvert in place. However, several studies have found erosion following culverts removal is minor, and results in much less sediment production than untreated sites (Switalski et al. 2004, PWA 2005, Cook and Dresser 2007). Sediment lost after culvert removals is typically due to unexcavated fill inappropriately left within the stream crossing (PWA 2005), and could be almost eliminated if the treatment was done correctly. Furthermore, research has found that using straw bales (or other mitigation measures) can reduce sediment loss during treatment by an order of magnitude (Foltz et al. 2008). Accordingly, we do not think it is appropriate to state at Plan at 70: "The risk of increased sedimentation from ground disturbance and exposed surfaces associated with drainage structure removal is weighed carefully against the benefits of restoring long-term hydrologic functionality." This is an artificially constructed conflict.

BMP 2.7: Road decommissioning, Explanation: We would not consider "blocking the road entrance" to be decommissioning, but rather "abandoning" a road. Often abandoning a road can create long-term pollution problems because the road is not hydrologically disconnected and erosion can persist for the long-term. Revegetation does not reduce the risk of road-triggered

mass failures or culvert failures. Even ditch erosion and chronic surface erosion can continue many decades after the road was abandoned. And of course all maintenance and monitoring ceases when a road is abandoned.

The Plan states that "[m]ore aggressive techniques may include greater and longer term risks to water quality through exposure of larger disrupted soil surfaces." (Plan at 72.) Again, there is no scientific justification for this trade-off. Full recontour–-the most "aggressive" form of road recontour has not been shown to create more sediment than leaving the road in place. (*See* Switalski et al. 2004). In fact it is often just the opposite in that less aggressive techniques will not restore the roadbed and continue to provide risks to the environment for generations to come.

BMP 2.7: Road Decommissioning, Techniques: bullet two states: "Optimize treatments that will achieve long-term watershed protection goals…" and "weigh benefits and costs of treatments against alternative of placing road in storage and costs for continuing to maintain for hydrologic functionality." If the road storage methods presented earlier consistently recommended removed culverts and leaving a "stored" road in a more ecologically benign condition, this would be an appropriate technique. However, as stated, this BMP suggests compromising long-term watershed health if funds are not available and is not appropriate.

BMP 2.1: Travel Planning and Analysis is examined here to reveal that all of the techniques are administrative and are apparently required by the four referenced documents at the beginning of the Section. It is helpful to have the references and the bullet points to understand how the USFS goes about Road Management. And several of the bullet points cite specific actions the agency can take to mitigate road issues. This is a good start for descriptions of the actual BMPs and their designs and functions, but do not constitute stand alone BMPs – there is simple too much technical and numerical information missing to call them a BMP to protect water quality.

BMP 2.2: The stated intent is to minimize problems and risks to water, aquatic, and riparian resources. The objective should be amended to include water <u>quality,</u> as the point is to achieve water quality standards in the State of California's waters through the effective use of BMPs. Note that in the above example, there are no actual BMPs suggested, no criteria to determine what BMP should be used where, no criteria to decide where to place a BMP, and no criteria for selecting a particular BMP design over another in these Techniques.

Without criteria and without specifics the BMPs do not support the intent to protect water quality, because the actual BMPs do not have an outcome. There is no accountability, because there is no information that provides a solid basis for whatever the BMP is going to accomplish.

BMP 2.2: It is not possible to discern what the BMPs are to accomplish. The vagueness is confusing in that once one thinks they have a BMP in hand, it is lost to questions about what it means. For example, "Locate road to fit the terrain" doesn't say what the water The Road "BMPs" contains many vague and uncertain words that make it quality relationship is. Whereas, "Locate roads to fit the terrain in order to protect water quality " says what it is about. Similarly, "Avoid sensitive areas such as…….overly steep slopes….to the extent practicable" contains no useful information. What is overly steep? What is the extent practicable? There is no criteria for how to use the BMP. It would be more effective and more explanatory to say slopes of xx%

in (type) soils of xx gravel size, and give a reference to the definition of the percentage of the steepness of slopes in what types of soils, with what types of vegetation for example. A reference to a specific table devoted to what is steep and what is overly step by criteria would provide the answer to overly steep, and a section of definitions would bring professional criteria to the directive.

The use of the term "to the extent practicable" is a vague way of saying the important decision will be determined later based on non-water quality criteria. The phrase should be deleted. If there are problems that are expected, then those problems should be disclosed and decisions made, based on criteria that should be openly revealed. Other stock phrases that should be deleted, in order to add clarity, are "if necessary", "to the extent practicable", "to the extent possible","follow general principles", "where appropriate", "where practicable", "where appropriate", "if possible", "adequate", "sufficiently effective", "appropriate."

There are statements in the Plan that are close to qualifying as a BMP. (Plan at 54.) But the addition of criteria, metrics, engineering drawings, or sketches and indications of when and where to use these advisory statements would close in on establishing actual BMPs. "Crossings," for example, is a different case. (Plan at 55.) Here is the potential for serious adverse impacts on water quality. For example, the fifth solid bullet "Design stream-crossing structures to provide the most resource protection consistent with facility needs, legal obligations, and cost considerations." In other words, the facility needs, presumably refers to the design constraints, which are unstated. There are no criteria for determining design, and no indication as to what water quality problems are addressed. Likewise legal obligations are not described, nor is it clear that legal obligations (to whom?) trump state water quality standards. There is no indication as to what the criteria are for the legal obligations or even if the legal obligations are superior to water quality standards. Further, cost considerations are of great concern. Of course there are cost considerations, which presumably came into play when the project was selected – did those considerations fully include the costs of the crossings and their obligation to meet water quality standards? It is critical in the adoption of these BMPs that pre-project costs include the specific BMP that is necessary to protect the state's water quality.

The Forest Service must disclose how the water quality requirements fit into the entire process of a project, to ensure that water quality protection does not become a victim of failures to address the costs of water quality protection in the initial design of the project, be it roads or road maintenance, timber projects that use the roads such as crossings, or other project proposals.

Literature Cited in Comments Related to Roads (*see also* submitted exhibits):

Cook, C. and A. Dresser 2007. Erosion and channel adjustments following road decommissioning, Six Rivers National Forest. In M. Furniss, C. Clifton, and K. Ronnenberg, eds., Advancing the Fundamental Science: Proceedings of the Forest Service National Earth Science Conference, San Diego, CA. 18-22 October 2004, PNW-GTR-689, Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

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Foltz, R.B., K.A. Yanosek, and T.M. Brown. 2008. Sediment concentration and turbidity changes during culvert removals. Journal of Environmental Management 87: 329-340.

Gucinski, H., M.J. Furniss, R.R. Ziemer, and M.H. Brookes. 2001. Forest roads: a synthesis of scientific information. General Technical Report PNW-GTR-509. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 103p.

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Timber Management:

Logging projects are ubiquitous on Forest Service lands in California. And yet the MND, Plan, Waiver, and associated documents completely fail to present the environmental baseline for these projects, current conditions in various logged and unlogged forests, and water quality conditions or concerns in each. Without this required baseline, it is impossible for the Board or the public to know what it is that the Forest Service plans to achieve as to restoring and protecting water quality in the context of logging operations.

The Plan states: "[t]he following are the BMPs for the control of non-point source pollution associated with timber management activities." (Plan at 19.) But the Plan inappropriately presents as BMPs merely administrative processes (in other words, what the agency routinely does to consider and implement a logging project, independent of any water quality concerns), with a few standards of management actions (in other words, how the agency actually does a logging project), and general statements about including corrective treatments and preventive measures that do not even refer to specific water quality issues.

Foremost, most of these BMPs do not specify exactly how the Forest Service would protect or restore water quality in the face of logging operations. As an example, although presented as BMP 1.1, the Timber Sale Planning process is an administrative process. (Plan at 19.) It is not a BMP, nor does it have anything whatsoever to do with what may happen on the ground to ensure that a particular logging project will protect and restore water quality. Adding this kind of

innocuous detail to the Plan may make it thicker but it does nothing to support the MND, which is predicated on the assumption that the provisions in the Plan will in fact mitigate the significant environmental impacts of logging projects to the point of insignificance. As another example, BMP 1.5 states that the Forest Service will establish an operating period for a logging operation. (Plan at 23.) There is nothing new about that. But as to protecting and restoring water quality, "BMP 1.5" states only that "[c]ontract provision B6.6 can be used to close down operations during the rainy season, high water, and adverse operating conditions, to protect resources." (Plan at 23.) In contrast, a real BMP as to temporal considerations for logging projects would require the line officer to establish, on a seasonal basis each year, and based on factors such as that year's precipitation, soil conditions, hydrological conditions, and other factors, a set period of operation and non-operations when project sites are closed and barred and sources of nonpoint source pollution are remedied. As a third example, BMP 1.6 discusses lands "unsuitable" for logging. (Plan at 24.) But determining that lands are unsuitable for logging is part of the *planning* process required under the National Forest Management Act; it has nothing to do with and is not a BMP for line officers to consider when implementing a logging project on lands deemed suitable in the planning process.

BMP 1.8 comes closest to being a real BMP, because it states that projects might include a streamside "zone of total exclusivity of activity, or a zone of closely managed activity," in riparian areas to filter sediment, maintain shade, and protect certain aquatic habitat. (Plan at 26.) But nothing in this BMP specifies any set-back or distance from waterbodies to help achieve any of those results. This too is left to the complete discretion of individual line officers. And the caveat that logging and other operations may *still* occur in such a zone as long as they are "closely managed" eviscerates any guaranteed protection or restoration of water quality.

Moreover, each of the purported BMPs are full of vagaries, including "consider", "reasonably", "'qualified," "secure favorable conditions of water quality", "unacceptable effects," "excessive damage," all of which are vague, subjective, and discretionary. Instead, each BMP should include at the outset the objective that the logging project will be conducted in such a manner to "protect and restore water quality." The specific criteria for each element should also be described. For example, BMP 1.2 proposes that there are various characteristics to be evaluated, but does not describe the criteria that guides the evaluations or what their relationship to water quality is. The failures of most of these BMPs recalls statements stakeholders made to the stakeholder group throughout the process of the need for a BMP manual. While the Forest Service continued to represent that it was impossible to specify strict conditions for logging projects because of the varied terrains, soils, and weather that existed for the public lands, stakeholders pointed out that CalTrans has the same constraints throughout California, yet has produced a second significant BMP manual to address water quality issues. The stakeholders recommended that the Forest Service acquire a copy of the Caltrans BMP and remove the vagueness of what the BMP is and what it does. The citations for the document and its companions are copied below:

http://www.dot.ca.gov/hq/env/stormwater/

http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

http://www.dot.ca.gov/hq/LandArch/ec/Erosion_Control_Technical_Guide_v2.pdf

The Plan proposes BMPs for logging and fuel reduction projects that reduce the level of monitoring required in the Lake Tahoe Basin pursuant to the Lahontan Regional Board's 2007 and 2009 Waivers. These waivers require project specific effectiveness and forensic monitoring in all watersheds for all high risk Forest Service projects including on steep slopes or in stream zones.

The Waiver proposes to replace those detailed requirements with a Forest Service monitoring program that relies heavily on the Forest Service's BMP Evaluation Program, which the Regional Boards have identified as inadequate to ensure that water quality standards are met. (*See* November 14, 2006 Letter from Lahontan, Central Valley and North Coast Regional Water Boards to the Forest Service critiquing Best Management Practices.) The importance of project specific effectiveness and forensic monitoring is detailed in the court declaration of Laurel Collins prepared for comments on Lahontan's proposed 2008 Memorandum of Understanding and Waiver with the Tahoe Regional Planning Agency. As the Board is aware, the El Dorado Superior Court overturned the 2008 MOU/Waiver based in part on the Regional Board's failure to consider the effects of changing monitoring standards in an EIR pursuant to CEQA.

The monitoring section of the Plan is vague as to the level of monitoring that would be conducted beyond the BMPEP in areas such as the Tahoe Basin, where all surrounding watersheds drain to Lake Tahoe, a Section 303(d) listed watershed. The evidence shows that the Forest Service's current approach, as illustrated in its still yet to be approved South Shore project, does not protect or restore water quality and further, proposes a substantial weakening of the monitoring standards set forth in both the 2007 and 2009 Lahontan Waivers. (*See* May 26, 2009 Comments of the Sierra Forest Legacy et al. on the South Shore Project; Declaration of Laurel Collins on South Shore project.)

Due to the potentially significant impacts of changing the monitoring standards for Lake Tahoe, the Board should have prepared an EIR for this Waiver. Instead, the MND provides no explanation for how monitoring will be as effective in ensuring that problematic Forest Service logging and fuel reduction projects in the Basin are promptly identified and corrected. Instead, section 6 of the Plan appears simply to lay out vague directives about cumulative watershed monitoring that in the Tahoe Basin has the potential for significant impacts to the lake and other waters.

Fire Suppression and Fuel Management:

There are two distinct areas of responsibility for the Forest Service when it comes to fire and fuels management. The agency has broad latitude with "emergency fire suppression" activities. Given the risk to public safety and private property that wildfires often pose, the Forest Service responds aggressively to wildfire ignitions during fire season with a range of equipment, personnel, and treatments, in order to halt and extinguish unplanned wildfires. Emergency fire suppression activities are considered critical and generally supersede other priorities on Forest Service lands. There are currently policy adjustments being made concerning the use of aerial

applications of fire-retarding chemicals that are applied from aircraft. No final decision on management policy has yet been released, but even Forest Service proponents for aggressive use of chemical treatments agree that the agency should consider wider stream buffers and avoiding critical aquatic wildlife habitat.

The second area of Forest Service actions more directly relevant to the Waiver includes fire suppression actions that are not truly "emergency" in nature, as well as a broad range of management activities designed to reduce fuel levels, create strategically placed area treatments (SPLATs) to slow the rate of future wildfires, and placement of fuel-breaks or pre-fire tractor-lines to ready the agency for potential future wildfires. By far the most widespread and potentially harmful of these activities for water quality are the shredding, disking, mastication of fuels, prescribed burning, and other fuels management actions that are presently being done or planned for tens of thousands of acres of national forest lands in California. In the Plan, the Forest Service explains that administrative, corrective, and measures such as fuel-breaks (defensive fuel profile zones), access roads and trails, fire-suppression activities, and fuel modification programs are all used with prescribed fire or mechanical treatments.

BMP 6.2 calls for mere "consideration of" water quality when designing prescribed fire treatments, while BMP 6.3 lists five techniques that are generally used to prevent water quality degradation. Neither BMP 6.2 or BMP 6.3 spells out any measurable standard or policy that can assure the Board that water quality will actually be protected during prescribed burning or post-burn management actions. BMP 6.4 and BMP 6.5 also fail to provide any clear, measurable, enforceable mitigation to ensure that water quality will be protected. BMP 6.4 provides only a general aspiration to avoid heavy equipment operation on fragile soils and steep slopes whenever possible. The "whenever possible" is not only too broad in leaving discretion to the incident commander or minor officials working a particular wildfire, but BMP 6.5 is nebulous by simply listing treatments that "are not limited to" various activities that may be selected for the purpose of repair of suppression-related resources. Similarly, BMP 6.6 (Emergency Rehabilitation of Watersheds Following Wildfires) describes four treatments that "may" include rehabilitation activities.

However, there is not a single BMP provided or even discussed that would apply to the vast majority of treatments tied to fuel management, shredding, disking, and mastication of fuels so as to create defensible buffers around private lands (wildland urban interface areas) or high resource values on public lands. This is a major deficiency in the Plan. No BMP spells out limits on the steepness of slopes where heavy equipment may be used to masticate, shred, or disk brush, groundcovers, woody slash, or other fuel. No BMP limits when fuel reduction treatments may be done on soils on steep slopes when those soils are saturated or otherwise vulnerable. No BMP ensures that waterbars are required at certain intervals along all tractor lines based on the degree of slope or the potential for onsite soils to erode during weather events.

Indeed, there is no information in the Plan or associated documetns as to the scope of work done in the name of fuels management on Forest Service lands in California on average over the past decade, nor is there any information provided as to feasible, reasonable mitigation measures that could be required for fuel-breaks, prescribed burns, or other fuel reduction activities that have significant effects on watershed values, soils, downslope water quality, aquatic species, and

vegetation that helps to hold the soil on steep mountain slopes. Despite this obvious informational flaw, the MND admits:

> Fire Suppression and Fuels Management: These activities may generate sediment and impact riparian areas during and after the firefighting process, which may include road building, re-opening of old roads, fire line construction, back- burning, and application of fire-retardant chemicals.

(MND at 4.) And yet the MND claims that the most significant changes in the Plan include new and stronger BMPs for fire suppression, fuels management, and vegetative manipulation. (MND at 15.) But no BMP focuses on how shredding, disking, mastication, or other similar fuels management activities will be designed or restricted to reduce or eliminate impacts to water quality. Elsewhere, the MND asserts that the fuel management activities fall into the category of "New or Substantially Improved BMPs." (MND at 16.) Yet no explanation is given in that section as to how even a single strengthened requirement has been added for fuels management projects that significantly disturb soil, remove protective vegetation on steep slopes, create new skid-trails from the heavy equipment, or otherwise alter natural watershed conditions. Similarly, the MND refers to a "Greatly Expanded Monitoring Program" for fire and fuel treatments. (MND at 17.) But as with all other noted deficiencies, that paragraph provides not a single example or description as to how fuels management activities will move beyond "…expanding the scope and ability of USFS monitoring to address many of these questions and to do so in a more timely manner." (*Id*.)

Even if the Forest Service somehow assumes that all fuels management activities will fall under the category of "Vegetation manipulation," the BMPs in that section fail to provide assurance that watershed and water quality impacts will be at acceptable levels. The BMPs for that section simply list possible actions that could possibly be taken if the project leader on the individual project chooses to select unspecified treatments.

As examples, for "soil disturbing impacts on the contour" in BMP 5.1 lay out possible options for windrowing, disking, and seed drilling – none of which solves the problem of fuels management activities denuding vegetation, working on steep slopes, or otherwise creating conditions where winter storms may wash sediment down into receiving waters. BMP 5.2 – Slope Limitations for Mechanical Heavy Equipment Operation, contains no actual limitations are even discussed or presented with a range of criteria for identifying which slope limit to apply. Instead, there is only a generalized discussion leading to the conclusion that field determinations will be made during project planning. For purposes of CEQA, an undefined mitigation measure that has no assurance of even being implemented cannot be considered acceptable for purposes of reducing the potential significance of an impact. BMP 5.4 further underscores the lack of acceptability of supposed management practices that will protect water quality during fuels management and other vegetation management projects. It simply allows for Forest Service personnel to possibly choose to re-seed denuded sites caused by vegetation management actions. There is no criteria set out as to what percentage of bare ground shall trigger re-vegetation, nor a time frame as to when re-vegetation shall be done, nor any description of criteria tied to the steepness of slope or other factors that are highly important to watershed values and water quality. Similarly, BMP 5.5 simply allows for some sort of possible treatment of organic debris,

without even beginning to provide even programmatic criteria as to when actions must be initiated, what actions shall be prioritized, or any other mitigation measure that actually must be implemented when organic debris accumulates. For all of these vegetation manipulation BMPs, the Forest Service fails to provide any clear requirement. Instead, the Forest Service lists only possible examples of actions that "may" be taken "if" a project leader chooses to do so. Even BMP 5.6, which purportedly sets limitations for heavy equipment on sites with high soil moisture, there is no criteria provided, no minimum threshold set for the Region, no monitoring required, nor any action identified as mandatory except for the evaluation of soil conditions during planning and operating limitations to be developed as alternatives are formulated.

The failure of the Plan and the various BMPs to provide any clear, measurable, enforceable, or proven mitigation measure for fuels management activities leaves the State Water Board to trust that across each individual district of each individual national forest, line officers will read generalized objectives and explanations and somehow glean from nebulous wording how to craft highly specific mitigation measures to eliminate water quality degradation from disking, mastication projects, shredding, prescribed burning, or other fuels management projects on their local sites.

The failure of the Plan to spell out clear, measurable minimum standards and BMPs that will assuredly protect watershed resources and water quality is a deficiency that the Board cannot overlook in assessing the potential for water quality violations to occur due to Forest Service activities. As the documents pertain to fire suppression and fuels management on Forest Service lands in California, the Plan and MND do not provide any prescriptive or required mitigation measures to prevent Forest Service activities from violating water quality standards or from degrading watershed conditions across vast areas of Forest Service lands in the state.

Recreational Activities:

The MND lists items the Forest Service selected as activities that can adversely impact water quality: Sanitary Facilities, Organizational Camps, Off-Highway Vehicles, Drinking Facilities at Developed Recreation Sites, Water Quality Within Developed and Dispersed Recreation Areas, and Pack and Riding Stock Facilities and Use Areas. But the MND, Waiver, and Plan improperly fail to acknowledge that still other recreational activities or facilities on Forest Service lands individually or cumulatively cause significant impacts to water quality, and these documents fail to establish appropriate BMPs or other methods to restore and protect waters for these activities or facilities: ski areas without NPDES permits; stock trails and use areas in non-wilderness; mountain biking trails and access facilities for the trails (parking lots); beaches and access areas at lakes and streams; access and location areas for recreational dredging in rivers; and snowmobile use areas, designated OS trails and undesignated OS areas.

Pack and Riding Stock Facilities

The June 15, 2005, report from former Forest Service seasonal wilderness ranger Gary Guenther demonstrates significant impacts on water quality by facilities for packstock or riding stock.

BMP 4.10 is not a best management practice to restore or protect water quality at all. Instead, it is an attempt by the Forest Service to have the Board give its imprimatur to a new, codified authorization for the Forest Service to authorize construction of "temporary" facilities for pack and riding stock precisely in those wilderness and other special areas where the facilities may cause significant adverse impacts on water quality.

The federal court case *High Sierra Hikers Ass'n v. Moore*, No. 00-1239-EDL (N.D. Cal. Oct. 30, 2007), is instructive on this issue. There, the district court ruled that the Forest Service failed to take a hard look at the impacts on water quality of commercial packstock operations and related facilities in the John Muir and Ansel Adams wildernesses in the Sierra Nevada, and authorized such operations in areas even though they were degraded. Based on impacts to water quality, in its order on injunctive relief, the court ordered that "[a]ll designated campsites, stock holding areas, and spot and dunnage loading and unloading areas shall be allowed no closer than 100 feet from water." (*Id*., Order of May 8, 2008.)

If the Board is interested in a provision that would actually restore or protect water quality in wilderness and other special areas, it would codify a distance of at least 100 feet back from water for any pack stock or riding stock facility, holding area, drop spot, or campsite, of any kind. The Board would not countenance waiving water quality requirements for "corrals" or "large campsites" for packstock operations or users only if they are not "immediately adjacent to stream or lakes," because that provision is ambiguous and subjective and will not restore or protect wilderness waters. Instead, the Board should insist that any BMP for these activities and facilities provide criteria for deciding how large group sizes or corrals will be, in order to protect water quality. BMP 4.10 also states that these facilities are merely "temporary" (i.e., they should "generally be in place for no more than one season of use), but this is meaningless because it fails to recognize the enormous damage that can be done in only one season to sensitive alpine meadows and riparian areas from any corral, large campsite, or similar facilities. And it further ignores that the water quality impacts of such degradation will last far longer than the one year of use.

BMP 4.10 improperly fails to address and resolve impacts to water quality from trails that are commercially-used by horses and mules to pack people, equipment and supplies into the backcontry and wilderness. Concessionaire-managed horse stables for horseback riding rentals in the frontcountry of national forests is also a source of trail damage, vegetation damage and polluted runoff from the stables that are located on National Forest lands. High Sierra Hikers has twice raised concerns about the impacts of horseback riding on such such trails in terms of their location immediately adjacent to Fallen Leaf Lake. Its letters note the presence of manure and deep dust and the failure of the Lake Tahoe Basin Management Unit to correct the problem. In fact, the Lake Tahoe Basin Management Unit proposes (Nov, 2010 letter) to wait to take any action until after there is a Access and Travel Management Plan, due out, at the earliest, in May 2012.

Trails:

The MND, Waiver, and Plan inappropriately fail to address or propose BMPs for trails. The Forest Service randomly applies the WEPP model to mountain bike trails. The Forest Service

has a manual of trail design features, but they are not specifically targeted to water quality. The BMPs for trails must include a location outside of a meadow, a design that captures runoff, a design that eliminates dust by using solid materials such as the description of the amount and size of rock and gravel to hold the soil surface on the trail, a design that provides for protection of the adjacent vegetation, and a design that crosses ephemeral or watered streams on rock structures that end on low slope areas and that prevent bicycles from riding around the crossings. Water bars, dips, and other trail features must have a design that prevents the bicycles from riding around the structures.

In short, the Plan and associated documents fail to provide maintenance BMPs for thousands of miles of existing trails and fails to provide BMPs for constructing trails that impact the state's waters with erosion, that channel water into ruts, and then rut the trails further through bicycle use in wet weather and on wet soils.

Developed and Dispersed Recreation Areas:

While the barely one-third of a page for BMP 4.9 purports to be a BMP for Developed and Dispersed Recreation Areas, it fails to offer any more than a modicum of outreach, and a cautionary and problematic enforcement triggered by citizen complaints. These comments focus on areas related to water, which is required to be protected from health pollutants and environmental pollutants. BMP 4.9 fails to describe how water falling on or running through or adjacent to developed recreation sites, such as campgrounds, visitor centers, parking lots, beaches, and other such sites will be protected. There are no criteria, no design specifications, no described implementation measures, no restoration measures, and no monitoring.

Access to Dispersed Recreation Places and Dispersed Recreation:

The Plan, MND, and Waiver improperly fail to establish BMPs for access to facilities for recreation, unless they are developed sites. Many of these places were user-created from expansion of user-created roads and trails, and can be as small as a nearby neighborhood watering hole, river swimming places, wading spots, and single use dredging operations or as large as an organization site, used annually, with no permit. The damage to the state's water quality includes erosion on banks, user-made parking, and lack of sanitation facilities. These are all primary contact areas that also include the potential for sicknesses from degraded and polluted water that is drunk or inadvertently swallowed by children and adults while playing in the water. The proliferation of these sites, in conjunction with the increase in population, increases significant impacts. The required BMP for Dispersed Recreation and Access to Dispersed Recreation must include criteria for selecting water quality protection measures, the specific measures and their designs, the implementation measures and the monitoring measures.

Documenting Water Quality Data:

BMP 4.3 purports to establish a process to collect and document data, but that is only a preliminary step to implementing water quality protection measures. The actions to actually protect the water quality are the BMPs. Data collection simply cannot, on its face, be a BMP. One cannot count cows and claim that as a BMP, since no action has been undertaken to protect

or restore water quality. In fact, the data collection is not described, there are no criteria, and there are no specific measures provided. It is important, but it doesn't do anything.

Organization Camps:

Organization camps create public health issues under regulation of the California Public Health and Drinking Water program. This is not a non-point source issue. But even if it were, BMP 4.6 fails to address or resolve runoff, erosion, and other sources of pollution from compacted soil in heavily-used campgrounds, poorly designed road runoff, poorly designed campsite runoff, steep slopes adjacent to these areas, and the location of sites near water. BMP 4.6 lacks required criteria, design measures, implementation measures, and monitoring measures.

Watershed Management:

The Waiver requires the Forest Service to conduct a cumulative watersheds effect analysis and include specific measures in the proposed project to reduce potential cumulative watershed effects analysis, and to include specific measures in the proposed project needed to reduce the potential for such effects in order to assure compliance with applicable water quality requirements. (MND at 21.) Such an analysis is the Board's responsibility, as a part of its duties to prepare the MND to support the Waiver, and should not be shifted to the Forest Service.

We respectfully request that the Board not issue any Wavier of this type or at this time. If the Board chooses to issue a Waiver, it must fully consider, analyze and disclose the effects of any Waiver, and alternatives to it, in an EIR under CEQA.

Thank you for your time and consideration.

Sincerely,

/s/ John Buckley
John Buckley
On behalf of Commenters

Enclosures:
Revised Exhibit List
Comments of Laurel Collins
Declaration of Laurel Collins (Lahontan waiver)
Declaration of Laurel Collins (South Shore project)

EXHIBIT INDEX

Documents and Materials Submitted in Support of Comments on Waiver

(Revised Aug. 24, 2011)

1. Comment, Jonathan J. Rhodes, Hydrologist, Planet Azul Hydrology (July 25, 2011) and Curriculum Vitae (Exhibit 1a).

2. High Sierra Hikers Association (HSHA), Letter to Susan Skalski Forest Supervisor at Stanislaus National Forest (July 19, 2009).

3. HSHA, Letter to Karen Caldwell at Summit Ranger District (Jan. 10, 2007).

4. Public Employees for Environmental Responsibility (PEER), Letter to Gaylon Lee at California State Water Quality Control Board and Barry Hill at USFS Region 5 (Apr. 4, 2010).

5. California Regional Water Quality Control Board Lahontan Region, Letter to Jennifer Ebert District Resource Manager at White Mountain Ranger Station (July 23, 2010).

6. David Martin PhD Candidate at University of California Department of Ecology, Evolution and Marine Biology, Letter to Tom Quinn Forest Supervisor Stanislaus National Forest (Aug. 31, 2007).

7. Notice of Appeal and Appeal of Decision and FONSI for the Rangeland Allotments Phase #1 (Decision # 16046) on the Stanislaus National Forest (Sept. 4, 2007).

8. USDA, Forest Service, Pacific Southwest Region, Letter to Darca Morgan Conservation Biologist at Sierra Forest Legacy (Oct. 15, 2007).

9. Felice Pace, Letter Complaint to Catherine Kuhlman, Executive Officer, NCWQCB (May 3, 2010).

10. Jason Martineau Wyoming Department of Environmental Quality, Letter to Mr. Scaife at Bighorn National Forest (Jan. 8, 2009).

11. Paul Rogers, "Risk Lurks in Sierra Waters – Study Shows Unsafe E. Coli Levels from Cattle & Horses." The Mercury News. (Apr. 26, 2006).

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15. California Regional Water Quality Control Board Lahontan Region, Investigative Order No. R6V-2011-0009 USFS Inyo National Forest White Mountains Grazing Allotments (Feb. 9, 2011).

16. CSERC Comments, Range Management (2011).

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18. USDA Forest Service Inyo National Forest, Petition No A-2151 Request for Stay of Investigative Order No. R6V-2011-009 Cal. Code Regs. Title 23, § 3869 (Jun. 14, 2011) and Exhibits 18a through 18g.

19. USDA Forest Service Inyo National Forest, Letter to Harold Singer Executive Officer of California Regional Water Quality Control Board Lahontan Region (Apr. 30, 2011).

20. USDA Forest Service Inyo National Forest, Letter to Laurie Kemper Assistant Executive Officer of California Regional Water Quality Control Board Lahontan Region (Jun. 26, 2011) and Proposed Workplan (Exhibit 20a).

21. Lindsey Myers and Brenda Whited, "Bacteria Contamination of Surface Waters Due to Livestock Grazing in the Stanislaus National Forest, California." (Aug. 30, 2010).

22. Lindsey Meyers and Jeffrey Kane, "Bacteria Contamination of Surface Waters Due to Livestock Grazing in the Stanislaus National Forest, California." (May 20, 2010) (Second year of study).

23. Lindsey Meyers and Jeffrey Kane, "The Impact of Summer Cattle Grazing on Surface Water Quality in High Elevation Mountain Meadows." Water Quality Expo Health (2011) 3:51-62. DOI 10,1007/s12403-011-0043-x.

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32. University of California, Links for information regarding "Rangeland Hydrology, Non-point Source Pollution and Water Quality." (last visited Jul 19, 2011) and documents referenced therein incorporated by reference.

33. Russell C. Croel, Jamie M. Kneitel. "Cattle waste reduces plant diversity in vernal pool mesocosms." Aquatic Botany 95 (2011) 140-145.

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36. Gaylon Lee, Issue Paper "Grazing on Non-Irrigated Rangeland." (Sept. 2005).

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from Meetings regarding the Meiss Meadow Grazing Allotment (dated Sept. 18, 1995 and Nov. 9, 1995) and Exhibits 38a and 38b.

39. Comments on Environmental Assessment for Cottonwood and Tres Plumas Grazing Allotments, Mono County from Lahontan WQCR to Lucinda J. McKee, White Mountain Ranger Station (Dec. 2, 1999).

40. U.S. Forest Service 2004-2007 E. Coli Sampling Data, Bighorn National Forest North Tongue River.

41. Joint Comments, Rangeland Issues (July 20, 2009).

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43. CSERC, CD with 2009 OHV Route Survey Data (namely Cedar Ridge and Crandall surveys), Exhibits 43 and 43a.

44. CSERC, Draft Comment Section Concerning BMPs Related to OHV use (undated but received by WELC Jul. 7, 2011).

45. California Regional Water Quality Control Board, Central Valley Region, Notice, Adopted Cleanup and Abatement Order for Eldorado County and the U.S. Department of Agriculture, Forest Service Eldorado National Forest Rubicon Trail Eldorado County (Apr. 30, 2009).

46. Steve Markman, Hydrologist "Roads that are known to adversely affect on aquatic features" Eldorado NF Study (May 22, 2009).

47. CSERC, Letter to Gaylon Lee at California State Water Resources Control Board (Apr. 14, 2010).

48. CSERC, Letter to Gaylon Lee at California State Water Resources Control Board (Mar. 31, 2010).

49. CSERC, Letter to Gaylon Lee at California State Water Resources Control Board (Mar. 31, 2010) (with photos).

50. Center for Sierra Nevada Conservation, Letter to Pat Trimble District Ranger at Georgetown Ranger District and Daphne Greene Deputy Director at OHMVR Division California State Parks (Jun. 1, 2011) with supporting documentation and photos (Tabs 1 – 16) as follows:

Tab	**Description**

1	Declaration of Drs. Howard Wilshire and Jane Nielson, with photos
2	Lower Rock Creek Crossing map and photos
3	Upper Rock Creek crossing map and photos
4	Trail 14E26, McKinney Creek Crossing map and photos
5	McKinney Creek High Water Crossing
6	Washout #1, Caldor Road location map and photos
7	Washout, failed culverts, Caldor Road location map and photos
8	09N55B Trail Crossing Middle Dry Creek location map and photos
9	Trail 14E25 raw crossing location map and photos
10	User-created crossing on Middle Dry Creek, road 09N55
11	"Aquatic Monitoring of the 49er Enduro on October 28, 2007" and plaintiff's notes on memo and crossings
12	"Aquatic Monitoring of an OHV Event on the Elkins Flat System (Oct. 25, 2009)"
13	Eldorado NF "Riparian Conservation Objectives Checklists" with analysis of roads on Light Canyon and Van Horn Creeks
14	"Roads that are known to adversely affect an aquatic feature," Eldorado National Forest Hydrologist report
15	Eldorado Road Inventory 2008
16	Sherman 09N10

51. Eldorado National Forest, 2008 Road Sediment Source Inventory and Risk Assessment – Alder Creek, Cat Creek, Dogtown Creek, McKinney Creek and Middle Dry Creek Watersheds (Mar. 27, 2009) and accompanying supporting materials, Exhibits 51a and 51b. Prepared by CSERC.

52. USDA, Forest Service, Eldorado National Forest Georgetown Ranger District Letter to CSNC (Jun. 10, 2011).

53. CSERC's "2009 Road Survey Report: Identifying Resource Impacts and Public Safety Hazards on USFS Roads in the Stanislaus National Forest."

54. CSERC, CD with 2009 Road Survey Report Eldorado National Forest supporting data.

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63. Report and Photos of Field Evaluation of Water Quality Issues at Rainbow Pack Station, Pine Creek Pack Station, Rock Creek Pack Station, Mammoth Lakes Pack Outfit, and Agnew Meadows Pack Station. Gary Guenther, Wilderness Watch (June 15, 2005) and Exhibits (Photos) 63a through 63f.

64. California Watershed Network, Comments to Gaylon Lee Forest Activities Program Manager, California State Water Resources Control Board (Jan. 9, 2010).

65. "Forest Service hit with violations at Tahoe projects." The Sacramento Bee (Nov. 3, 2009).

66. Sequoia ForestKeeper, Review of DRAFT Water Quality Management Plan – Timber Management.

67. Notice of Violation issued by California Regional Water Quality Control Board – Lahontan Region, to USFS for Discharges Related to Timber Harvest and Vegetation Management (Oct. 19, 2009).

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69. Appeal of Decision Notice and Finding of No Significant Impact for the Stampede Environmental Assessment, filed by Lahontan Region EPA against USFS (Oct. 5, 1998).

70. Letter, from Lahontan Region WQCB to USFS Lake Tahoe Basin Management Unit (Jan. 11, 1996).

71. Letter, from Lahontan Regional WQCB to Mary Wagner, District Ranger at Carson Ranger District (Mar. 6, 1997).

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73. Comment on Proposed Order No. R1-2010-0029 Waiver of Waste Discharge Requirements for Nonpoint Source Discharges Related to Certain Federal Land Management Activities on U.S. Forest Service Lands in the North Coast Region, from EPIC to North Coast Waster Quality Control Board (May 17, 2010) and Addendum #1 thereto (June 1, 2010), and Exhibit 73a.

74. "A draft workplan: Learning how to apply adaptive management in the Sierra Nevada Forest Plan Amendment." Submitted by the University of California Research Team (Feb. 28, 2006).

75. Appeal of Decision Notice and Finding of No Significant Impact for the Noxious Weed Control Program for the Humboldt-Toiyabe National Forest, Bridgeport and Carson Ranger Districts – Alpine, Lassen, Mono, Nevada, Plumas and Sierra Counties, from Lahontan Region WQCB to Jack A. Blackwell, Regional Forester at USFS Intermountain Region (June 18, 2001).

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81. Appeal of Final Environmental Impact Statement and Record of Decision for Liberty Forest Health Improvement Project, filed by Lahontan Regional Water Quality Control Board against USFS (May 1, 1998).

82. Comments on a Statewide Waiver, Don Rivenes (undated).

83. Memorandum, from Ranjit S. Gill, Chief, Planning & Toxics Unit, Lahontan Regional Water Quality Control Board South Lake Tahoe, to Gaylon Lee at State Water Resources Control Board (Sept. 17, 1996).

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87. Memorandum, from Harold J. Singer, Executive Officer at Lahontan Region WQCB to Gaylon Lee at State Water Resources Control Board (Apr. 10, 1996).

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89. Letter, from Tahoe Regional Planning Agency to USFS Lake Tahoe Basin Management Unit (Oct. 1, 1997).

90. Statement of Natalyne Delapp on behalf of EPIC to State Water Resources Control Board (undated).

91. Comments on Stakeholder Process as of January 12, 2010, from Laurel Ames and sent to Gaylon Lee at SWRCB (undated).

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Certain Federal Land Management Activities on U.S. Forest Service Lands, from Sequoia ForestKeeper to State Water Resources Control Board (July 5, 2011) enclosing Order on Plaintiff's Motion for Reconsideration from Sequoia ForestKeeper v. USFS et al., No. CV F 09-392 LJO JLT (E.D. Cal. 2010), and Exhibits 93a and 93b.

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98. Letter from U.S. Forest Service, Lake Tahoe Basin Management Unit to HSHA. (Nov. 19, 2010).

99. Letter from HSHA to U.S. Forest Service, Lake Tahoe Basin Management Unit. (Mar. 28, 2011) and photographs (Exhibits 99a and 99b).

100. Motorized Travel Management Supplemental EIS – Tahoe (Feb. 2010).

101. Motorized Travel Management EIS – Stanislaus National Forest (undated).

102. Final EIS – Eldorado National Forest (undated).

103. Motorized Travel Management Record of Decision – Lower Trinity and Mad River.

104. Final EIS - Motorized Travel Management – Sequoia National Forest.

105. Motorized Travel Management – Plumas National Forest.

106. Draft EIS – Travel Management – Lassen National Forest.

107. EIS – Inyo National Forest (Jan. 2009).

108. Travel Management – Sierra National Forest.

109. Revised OHV Trail Monitoring Form (GYR Form) and Training Guide prepared for USFS Pacific Southwest Region (July 30, 2004) (Laurel Collins Comment Exhibit 6).

110. OHVs – Photos 1 (Laurel Collins Comment Exhibit 4).

111. OHVs – Photos 2 (Laurel Collins Comment Exhibit 5).

112. Laurel Collins Comment Exhibit 1.

113. Laurel Collins Comment Exhibit 2.

114. Laurel Collins Comment Exhibit 3.

115. Attachment B to 2010 Soil Report from Eldorado National Forest (Laurel Collins Comment Exhibit 7).

116. Excerpt from Soil Conservation Handbook, Sierra Business Council (Laurel Collins Comment Exhibit 8).

117. Laurel Collins Comment on Statewide Waiver (Aug. 23, 2011).

118. Laurel Collins Comment on Lahontan Waiver (Nov. 25, 2008).

119. Laurel Collins Comment on South Shore Project (May 26, 2009).

120. Sierra Forest Legacy, Comments to Lake Tahoe Basin Management Unit (May 26, 2009).

121. Comments of John Buckley.

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TECHNICAL MEMO ON REVIEW OF FOREST SERVICE BMPS FOR OHVs, MONITORING AND ADAPTIVE MANAGEMENT
Laurel Collins, August 23, 2011

Dear Mr. Graf,

At your request, I have reviewed the Forest Service draft BMPs set forth for roads (Section 2) and Off Highway Vehicles (OHVs) (Section 4.7) and the adaptive management (Chapter 4) and monitoring (Chapter 6) of the Forest Service's draft Water Quality Management Handbook (WQMH). I have also reviewed background information, including photos, relating to OHV activities and water quality impacts in National Forests in California.

The purpose of this review was to assess whether the road and OHV BMPs and the WQMH are adequate to ensure that future potentially significant impacts from non-point source discharges will be avoided. This question is relevant because the State Water Board is proposing to waive waste discharge requirements (WDRs) for activities on Forest Lands, based on the assumption that Forest Service BMPs, monitoring and adaptive management will avoid significant impacts to water quality. As set forth below, in my opinion the reviewed BMPs are not adequate to warrant that assumption. Instead, I believe the adoption of the waiver has the potential for significant impacts because it essentially approves the Forest Service's regulatory program, which in my opinion fails to ensure that water quality will be protected from OHV activities.

I. Professional Background

I have been a geomorphologist since 1981 specializing in fluvial, hillslope, and tidal wetland geomorphology, sediment budgeting, landslide and stream mapping, assessment of silvicultural impacts on sediment supply to streams, and analysis of geomorphic change from natural and anthropogenic influences. My experience on the issues raised by the State Water Board Waiver and MOU is based on my work on various sediment source assessment and monitoring projects for the US Forest Service, California Department of Forestry, US Department of Justice, US National Park Service at Point Reyes National Seashore, Water Resources Division of the US Geological Survey, San Francisco Bay Regional Water Quality Control Board, Alameda County, Marin County, Contra Costa Clean Water Program, the Southern Sonoma Resource

Conservation District, the San Francisco Estuary Institute, and the East Bay Regional Park District. I am the Owner and Principal Scientist of Watershed Sciences consulting firm, which I established in 2001. Attached to this review is a copy of my current CV. A few examples of my experience follow.

For the California Department of Forestry (CDF) I was involved in a 5-year monitoring project for the Board of Forestry to assess the effectiveness of forest practice rules that were developed specifically to reduce erosion and sediment supply to streams in areas that had various silvicultural practices, ranging from clear cutting to selective helicopter logging. At numerous 10-acre study sites located throughout private and public California forestlands, effectiveness monitoring of erosion control practices was conducted by measuring sediment trapped behind erosion control structures (such as water bars and dissipation structures), by measuring the size of voids created by landslides, gullies, rills, and from failed road crossings associated with logging roads and tractor trails. Quantitative data were collected yearly, statistically analyzed, and total sediment supply on logged sites was compared to that from study sites that served as controls, where no silvicultural practices had been previously conducted. Photo monitoring was an integral component of monitoring and used to document and verify conditions.

For the Pacific Southwest Forest and Range Experiment Station, I established ten long-term monitoring sites of channel and erosion conditions in the wet meadows of the Golden Trout Wilderness, Inyo National Forest, California. The monitoring sites were within and outside of cattle exclosures. I produced detailed stream maps, with quantitative data on sediment size classes, longitudinal profiles, cross sections, and a methodology for monitoring and assessing future change.

For The Point Reyes National Seashore I monitored post fire sediment production and runoff following the 1995 Vision Fire. This involved stream gaging, measurement of sediment deposition in a developing alluvial fan, assessment of hydrophobic soil conditions, and monitoring stream and landscape response for over five years. Similarly, for the East Bay Regional Park District, following the 1991 Tunnel fire in the Oakland Hills, California, I monitored erosion and sediment production as influenced by fire, as well as by people following the application of post fire erosion control activities.

For Alameda County, I developed a preliminary sediment budget for Alameda Creek and protocols for developing a sediment budget by monitoring sediment load at key gaging stations along the stream network. Recently for the San Francisco Regional Water Quality Control Board, I developed a methodology and performed an analysis of sediment sources and determined long-term sediment supply rates from the stream and hillsides of the nearly 100 sq mi Sonoma watershed for a TMDL (total maximum daily loads) analysis of fine sediment.

2. Potential Impacts of OHV Activities on Water Quality

Numerous studies have documented how OHV use has significant impacts to water quality and beneficial uses due to sediment discharge to water bodies caused by erosion, trail compaction and breakdown of stream-bank stability. (*See* References cited.)

In particular, OHV roads or trails located near or hydrologically connected to perennial or ephemeral watercourse have the potential to discharge significant amounts of sediment, with corresponding negative impacts on water quality and impairment of beneficial uses of the system. This is most prevalent and pervasive where runoff from road and trail surfaces and lead-off ditches discharge water and sediment directly into streams. Unless trails and roads and lead-off ditches are eliminated from sloping landscapes, these trail-related runoff pathways become artificial channels that permanently increase the drainage network, essentially discharging more water and sediment directly to streams. This causes persistent increases in peak flows and fine sediment to watercourses below. Although BMPs strive to reduce the hydrologic connectivity of roads and trails, they cannot and have not eliminated these negative impacts. These impacts are cumulative, both spatially and temporally. Hence, water quality and aquatic habitat continue to degrade. The reasons for failure of water quality protection range from the physical conditions that water runs downhill to conceptual inadequacies in management and policy. Examples of these are discussed below.

Physical mechanisms

OHV roads and trails provide a bare surface that is subject to raindrop impact. Even if OHVs are not present the bare road surface will generate fine sediment through the impact of rain. If there is a gradient, the water will flow downhill and transport its suspended sediment. If there is enough run-out distance and gradient, and the water becomes concentrated, it will have enough velocity and shear force to cut rills and gullies, thereby creating its own pathway and generating more sediment as bed load. Since road treads are purposely compacted and trail treads on soft soils become compacted with increasing OHV usage, infiltratation will decrease and runoff will increase, more so than under any natural forest conditions. Further, soils on OHV roads and trails dry out in the summer and when used by OHVs during dry periods become extremely dusty, sometimes having several inches of dust on the surface. This sediment can be blown in waterways during continued disturbance and flushed into waterways with the first storm event that causes flushing flows.

On OHV trails, water becomes especially quickly concentrated between the berms that are created by tires driving over “softer” soils and by the spatter berm that forms when mud is thrown off the tires and accumulates to the side of the track. As a result, as road gradient increases, water within the tire track or berm quickly increases its ability to transport downhill the sediment generated from raindrop impact, and as flow becomes concentrated, more sediment will be

generated from rills and gullies eroding into the road tread. The road cut banks also provide a constant supply of sediment into the ditch or onto the road tread from soil creep, dry raveling, and rain drop impact processes. This is most evident in older road cut banks where many exposed tree roots can be observed

Many OHV trails and especially the OHV vehicle route roads, have lead-off ditches that connect the road runoff and sediment into the stream network. These lead-off ditches provide direct inputs of sediment from erosion of inboard ditch, the road tread, and from the road cut bank(s). As the water flows from the road tread into either lead-off ditches or traps associated with rolling dips, and especially if maintenance is insufficient of the trap, the water will eventually cut a new pathway and deliver its sediment load to a stream course. It will not matter if the stream is perennial or ephemeral, sediment will be delivered at a rate far greater than the natural background rate. This is happening pervasively and persistently from all dirt roads and trails throughout the forestlands. The roads and trails have become permanent extensions of the channel network. In many situations on steeper slopes, it is virtually impossible to prevent this connectivity to the stream network.

It has been well documented in the scientific literature that increases in channel network, otherwise called increased drainage density, which is just channel length per unit area, will cause peak storm flows to increase in size and frequency. This is often observed by an increased frequency of flooding and is an example of a cumulative impact. This is caused by the faster rate and the greater total amount at which surface water is delivered to the channel system. Whether it be permanent extension of the drainage network, through lead-off ditches for example, or ephemeral extension, through temporarily failed and then repaired water bars or filled sediment traps, the total drainage network to the natural stream system becomes artificially increased through road and trail networks.

Such increased runoff and peak flow from OHV roads and trails cause the receiving and downstream channels to adjust their hydraulic geometry to accommodate the changes in water and sediment delivery. The adjustments are accomplished by bed incision, bank erosion, or by filling with sediment and cutting or ‘eroding” a new avulsion channel. Either of these cutting or filling processes involve adjustments in channel dimensions will generate more sediment as the channel modifies its geometry to increases in the supply of water and sediment.

Management and Policy Process

Although there are various iterative check systems established between the WQCB and USFS to suggest that water quality will not be degraded by OHVs, this type of management “process” often fails for various reasons. The reasons can be numerous but assuming that personnel are properly trained to identify problems and design remediation the following issues still occur:

- lack of personnel to identify problems at all sites and to deal with all problems as they arise,
- lack of funding to fix problems after they are identified,
- lack of funding to provide sufficient personnel and to properly remediate all problems (usually only the worst are given high priority and they still can lack funding),
- lack of trigger mechanisms that prompt a response to fix problems and provide funding,
- lack of maintenance funding, which is required in perpetuity that prevent nonproblem sites (green and yellow designations) and restored sites from becoming problem sites as long as the OHV sites are open to the public,
- and the inability to check for problems when sites are inaccessible during the rainy season. (This latter problem will always be a problem and cannot be prevented.)

These issues are discussed more fully below in my review of the Forest Service's WQMH and BMPs.

As part of my review I have examined photos of OHV trails in the Stanislaus and El Dorado National Forests. Pollution impacts from these photos are evident, as explained below.

Exhibit 1 attached to this declaration contains photos of the lower section of what is known as the Rock Creek trail in the El Dorado National Forest. These photos demonstrate how an OHV trail on a gradient over 15 % slope has become devoid of vegetation and thus a perpetual and considerable source of sediment. Given the gradient and exposed soil, it is inevitable that during storm activities this trail will supply fine sediment to the stream shown in the photos. This would not occur under natural forest conditions and is a direct man-made negative impact on impact on water quality.

In my opinion, even if water bars were placed at recommended spacing, there is no way to prevent all trail-generated sediment and water from being discharged into streams, even with recommended maintenance activities. This is because there will always be some amount of road tread upstream of a road crossing that does not have a constructed water bar and it will be impossible to prevent sediment from entering the stream from this portion of the road. Inboard road ditches and very steep trails are specifically designed to drain directly into channels at road crossings, and when OHV trails parallel or approach a channel there is often too insignificant of a hillside distance to adequately dissipate the discharge from a lead-off ditch. On steep trails greater than 20%, rolling dips are inadequate and sediment traps near streams can fill rapidly and not receive adequate maintenance. When there is inadequate dissipation on the side slope a new rills or gullies will generate additional sediment that is not initially from the trail. More importantly, toward the end of the rainy season or during intense storms, water bars, for example, can become ineffective because sediment fills behind them and their height might already be worn down by traffic usage. The sediment trapping efficiency of the water bar is diminished and sediment laden water filling behind the bar can eventually flow over the bar, breaching it or end-

cutting it, and then with greater erosive efficiency blow out the next down-trail water bar, if there is one. I have observed this many times on logging trails that have less usage than OHV sites.

Exhibit 1 shows in the first photo the application of cinder blocks to harden the surface of the road at the top of the trail above a stream crossing. Hardening is a type of maintenance action in which cinder blocks are placed on the route to avoid contact between sediment and OHV riders. This and other mitigation efforts that are designed to strengthen the trail do not address the substantial sediment that occurs due to steep gradient trails that descend to a watercourse. Hardening a steep gradient trail is generally not feasible due to the slope and even if it were feasible, it would be prohibitively expensive. As a result, hardening techniques are typically limited to trail sections without significant gradient (as shown in the photo), and thus cannot hope to mitigate the significant impacts of sediment traveling downslope on trails such as the one depicted in the photos in this exhibit.

Further, even if the entire downslope trail segment *could* be armored, it is clear from the photo that the OHV drivers prefer to drive on the soil to the side of the cinder block rather than drive on it. Such referential driving has created a rut to the side of the cinder block, which now provides a course for flowing water, and rendering the blocks ineffective at preventing erosion and preventing sediment from entering waterways. Clearly, OHV trails will also widen through this process, generate more resource damage, and the money and labor spent on the cinder blocks becomes poorly spent and ineffective in preventing increased sedimentation.

Exhibit 2 attached to this declaration contains photos of OHV trails in a comment letter submitted to the Stanislaus National Forest. (*See* Comments of CSERC, dated April 14, 2010.) These photos demonstrate how OHV roads and trails create their own road-related drainage channels leading to substantial amounts of sediment discharge in a stream, in this instance up to 16 inches of sedimentation in a channel which then caused the death of adjacent forest vegetation. This kind of egregious impact destroys aquatic habitat, converts surface flow to subsurface, and increases water temperature during higher flows due to the loss of riparian shade as indicated in the 5th photo of the document. These are examples of innumerable negative impacts that are happening all the time throughout OHV sites.

In my view, the steep gradient of this road and OHV route leading to a stream shows that sedimentation of the stream was inevitable and is clearly not being prevented, even where BMPs are applied. The rills and gullies created on these trails as depicted in the photos are inevitably the combined results of OHV use because drivers will ride over or around berms thereby breaking them down and reducing their efficiency, and when boulders are added to the water bar construction to prevent this (as seen in one of the photos), the erosive ability of the water can simply undermine the boulders and around or beneath them thereby not preventing sedimentation of water course.

These photos demonstrate that where steep trails are created on soft native soils that are not compacted, use results in the tread being removed and side berms being built up. As a result, the trail tread winds up being below the level of the adjacent land and mitigation measures such as water bars become ineffective because it is impossible to force the water to drain off sidewise; instead the water will run down the trail. Avoiding this result would require constant maintenance to knock down those side berms and replacing the displaced soil on the trail. This level of maintenance is extremely labor intensive and difficult, and in my experience is practically infeasible to accomplish on a constant basis over time. As a result, such rutted OHV trails above and near streams cause perpetual direct and indirect sediment inputs.

The letter in Exhibit 2 is also a documented example of the limits of mitigation and how the conceptual process of the WQMH does not protect water quality. On the last page of the document it is stated that the USFS was aware of the problem, but had no funding for correction. Further stated is that there had been recent approval of the OHV route even though there was awareness that the route needed mitigation treatment and seasonal closure.

The photos demonstrate that OHV use with its associated erosion and sediment supply and subsequent maintenance becomes a perpetual game of chase that never really prevents the addition of OHV trail-related sediment from being supplied to channels. Instead, every year, regardless of available funds or how much maintenance has been done, OHV trails become conveyor belts of sediment switched to ‘on’’ during every storm season.

In my opinion, the resulting impacts to the stream from these types of hydrologically connected routes are significant because of both the downstream discharge of sediment affecting water quality for years to come but also the immediate site specific effects on the channel at the point of sediment discharge. The photos show a stream channel now choked with dead trees and deep sediment. It is not certain, in my opinion whether restoration of the stream, soil, and vegetation resources in the area is even possible; certainly not in a short time frame. Even if restoration were possible, the astronomical costs would most likely prevent effective implementation.

Exhibit 3 attached to this declaration contains photos taken of authorized and unauthorized OHV trails in the Stanislaus National Forest. These photos demonstrate the extent of sediment erosion and damage to water quality in streams that is inevitable where routes descend and then cross over water courses. As discussed, the ability of mitigation measures to avoid these impacts is limited due to the very nature of the trails becoming an extension of the drainage network during storm events. It is clear from these photos that any substantial amount of rainfall will create significant unmitigated impacts to water courses by sedimentation and destruction of stream bank stability.

Exhibit 4 contains photos taken of an OHV route in the El Dorado National Forest at a crossing of McKinney Creek. (The locations of the photos are described in the Exhibit.) These photos provide another example of how an

OHV route on a significant gradient near a stream will invariably lead to the creation of an artificial water channel on a sediment laden trail, leading to significant sediment discharges into the water course. In this case the sediment flow is ongoing due to the presence of an upslope spring; however it is clear that this flow would be even more vigorous – and the sediment discharge even greater – during a storm event.

My understanding is that the Forest Service has not proposed closure or rerouting of the trail, but rather to do "hardening" of the route's approach to the stream crossing. As discussed above, the ability of hardening to reduce sedimentation impacts is limited due to the infeasibility of hardening the trail segment above the stream crossing that is depositing sediment downslope and due to the tendency of riders to avoid the cinder blocks and ride instead on the adjacent soil. In my opinion, on many OHV routes that descend down to stream crossings, hardening is not a feasible mitigation measure that will avoid significant discharge of sediment over time.

Exhibit 5 includes two photos of a failed culvert on the El Dorado National Forest. These photos show the impact of OHV use on the destruction of structures placed at stream crossing that are designed to convey lead-off ditch water and/or stream water from an upstream channel. Culverts and pipes can become easily crushed during OHV use as demonstrated in this picture. When this happens they can no longer transport the water and sediment load conveyed to the inlet and water is then discharged across the road tread and fill where it can potentially cause a sediment supply to the downstream channel from flowing across the road tread, gully the road fill and provide additional sediment, or worst case scenario blow out of the entire road fill and render the road impassable and require expensive repair. This kind of erosion of the road surface can also happen just from clogging by woody debris or sediment of the culvert or conveyance structure during the rainy season. Such a condition at the earliest would not be found until after the end of the rainy season. During my years of experience I have also observed numerous erosion and sediment supply examples caused by undermining from water leaking into the fill from beneath rusted corrugated metal pipe culverts and by concrete pipes breaking at their joints because of differential fill settlement.

3. Review of Forest Service BMPs for OHVs

As part of my review for how the Forest Service proposes to control sediment discharge from OHVs, I have examined two sets of Forest Service draft BMPs, for roads (Section 2) and for OHVs (Section 4.7). In my opinion, these BMPs are not likely to avoid continuing adverse water quality impacts from OHVs, as discussed below.

a. BMPs are Mostly Limited to the Design of New Trails.

Most of these BMPs refer to planning and designating new roads and trails on the Forests. Recently, however, the National Forests in California adopted Travel Management Plans, which authorize thousands of miles of pre-

existing roads and trails, most of which were not located according to the type of planning criteria proposed in the BMPs relating to protecting water quality or avoiding routes that follow a gradient down to a stream course. As shown in the photos discussed above, many of these existing trails are in fact adjacent to or cross water courses and/or are located on steep hillsides that are prone to erosion. As discussed above and demonstrated by the various photos, as trails approach or parallel nearby stream courses (whether they be perennial, intermittent or ephemeral), in my opinion it is not possible to prevent sediment supply that can significantly affect water quality.

b. Proposed Mitigation for Existing Trails Does Not Ensure that Significant Impacts to Water Quality Will be Avoided.

In my opinion, as to the numerous *existing* roads and trails on Forest Service lands, the BMPs do not provide an adequate regulatory framework to ensure that significant water quality impacts due to sediment discharge will be avoided for several reasons.

First, the BMPs do not contain any information about the circumstances under which an OHV trail would be closed or relocated. As discussed above, many existing OHV routes are inherently problematic due to their close proximity to watercourses or creation on steep erodible slopes that inevitably create sediment laden drainage ditches discharging directly to the watercourse below. In my opinion, there is no practical, feasible mitigation that can ensure that such problematic trails do not discharge significant sediment loads over time.

The problem with the BMPs in this respect is the lack of any standard under which a trail would be closed or relocated. The photos discussed above illustrate problematic trails that inevitably will discharge sediment to streams, yet none of these trails have been closed or relocated. Nowhere in the BMPs is there any information about what amount of resource or trail damage, either qualitatively or quantitatively assessed, or volume of sediment entering channel, would trigger closure. As a result, there is no standard that would ensure that significant water quality impacts will be avoided.

This problem is illustrated by the Forest Service's own monitoring protocols. According to the BMPs, the Forest Service will rely primarily on "Schedule G-Y-R Trail Condition Monitoring" to identify high risk trails. The BMPs (p. 122) state that based on this monitoring, the Forest Service shall take "immediate corrective action" for "adverse water quality effects" or where there is a "potential for substantial adverse impacts to water quality."

Under the GYR monitoring system, trails rated "red" are described as having "excessive erosion" discharging to watercourses. Steep approaches to streams are rated red where there is evidence of "accelerated erosion." *See* Exhibit 6, attached. As discussed, the photos reviewed depict trails that meet these descriptions and which clearly have the potential for substantial adverse impacts to water quality. For example, the Rock Creek photos in Exhibit 1 depict a sediment laden lower trail section that will inevitably discharge significant

amounts of sediment when the storm season recommences in winter. Under the BMPs, these conditions should trigger temporary closure of trails or areas until completion of corrective action. However, no closure or trial rerouting has occurred for any of the trails depicted in the photos. This result will likely be the same in the future because the BMPs do not actually *require* any action to be taken within any particular time frame based on any measurable standard.

For example, the Forest Service routinely allows for trails identified in "red" condition to be continually operated, while it considers various maintenance or mitigation options. *See e.g.,* Exhibit 7, El Dorado National Forest Soil Conservation Plan, Attachment B. To avoid significant water quality impacts, a "red" condition due to excessive erosion to a watercourse should trigger a specific management response such as immediate closure. However, this result is not in agreement with the statement on page A-3 of the GYR Form, which states "trails rated red are to be repaired or closed within six months." Waiting for a period of 6 months allows water quality degradation to continue with no immediate abatement of the condition and with no apparent justification for waiting for such a long time.

Further, as discussed above in relation to the photos, trails that are clearly meeting the standard of a "red" condition – such as depicted in Exhibit 1 -- are in fact allowed to stay open for continuous operation despite the fact that no corrective action is ever taken. As a result, trails meeting the "red" criteria under the Forest Service's own monitoring protocols may continue to discharge significant amounts of sediment into nearby watercourses, leading to significant impacts on water quality. Nothing in the BMPs avoids this foreseeable result in the future.

A second related problem is that the BMPs merely *suggest* mitigation measures that *could* be applied to reduce sediment, but do not actually *require* any mitigation to occur. On page 114, for example, the BMPs state that trail segments will be identified that are causing adverse impacts to water resources and prioritize mitigation measures . . .". However it is not clear how prioritization is done and what the criteria are for prioritizing.

In my experience prioritizing how or *whether* water quality problems are fixed will be based upon available funding and staff or lack of it. Certainly funding, staffing and other similar factors must weigh in the decision process in "prioritizing" mitigation, yet these factors are not discussed and ranking order of priorities is not provided. As discussed above, the photos show that many problematic trails are neither closed nor mitigated for long periods of time. Where funding and available staff act as a roadblock to fixing identified problem areas, the BMP effort will continue to fail and water quality will continue to be degraded. This is a significant issue that should have been discussed in the review documents.

Third, many of the mitigation measures proposed are not likely to be effective in preventing OHV sediment discharge. As discussed above, "hardening" and "water bars" are relatively ineffective in preventing substantial

sediment discharge from continuous OHV trail usage on steeper slopes. Rolling dips can be more effective, but 1) are expensive and technically difficult to install due to the need to create a compacted soil bar that is resistant to OHV riding; 2) not effective at gradients over 20%; and 3) require continual upkeep and maintenance, which becomes problematic for longer trail sections at a time when funding and staffing are being reduced, as discussed above.

Where feasible, the USFS (Poff 2006) suggests that rolling dips are preferred alternative to outsloped roads, inboard ditches, and water bars. Yet as discussed, these BMPs can only be applied to trails that are less than 20%, not to the steeper sites that have the greatest potential for negative impacts. Further, it is stated that rolling dips will require less maintenance if properly constructed but it is also stated that the sediment traps are small. This implies that the greatest limitations will be their size, influencing the effectiveness of their trap efficiency and their need for frequent maintenance. Poff suggests that maintenance frequency for the rolling dip might be 3-5 years. In my opinion, this does not appear sufficient for monitoring and maintaining the traps. Hence, in my opinion it is likely that even if rolling dips were used more extensively, sediment will still be supplied to streams and negative impacts cannot be avoided at OHV sites.

For water crossings, (BMPs p. 119) it is stated that bottomless arches or buried pipe-arches should be used for watercourses that have identifiable floodplains or elevated trail prisms. Arches are not a good solution because of their inherent shape. It is stated that bankfull dimensions should be sustained; yet archways reduce the very dimensions of flood flows that it is most important to preserve and that is the floodprone width. The appropriate floodprone width is key to maintaining channel stability. In natural channels the floodprone width of a stable channel is often more than twice the bankfull width (Rosgen1993; Rosgen 2007). When stream flow goes into an archway, its floodprone width gets smaller than its bankfull width. This causes the flow in the archway to have very high shear stress and water velocity. As the water exits the arch the high shear stress caused by the elevated height of water causes scour in the channel at its outlet and high velocities and subsequent erosion on the banks downstream of the outlet. This is a misguided BMP that will create more sediment supply from in channel adjustments.

Also in the list of recommendations for watercourse mitigations is that wet areas with naturally high water tables should be crossed with permeable fills, perched culverts, and/or culvert arrays to maintain hydrologic functions. These recommendations will cause damages to the vegetation community and wetland resources because the road prism, even with associated drainage structures, will not drain or move water across the wetland at a similar fashion or rate that was done prior to the road or trail crossing. In this case, the worst case scenario is that the lower portion of the wetland will have water completely blocked from it from clogged or damaged drainage structures, causing a new drainage course to form, or alternatively, cause flow to go over the road, causing the road to wash out and deliver further sediment to the wetland.

Finally, the BMPs (p. 117) indicate that watercourse crossings would be designed "for a 100-yr storm event to allow for unobstructed flow including bed-load and organic debris, and to provide for passage of desired aquatic and terrestrial organisms." In my opinion it is unlikely this will occur. First, there are probably no data available for actual 100-yr bed load transport at most OHV stream crossings, making it nearly impossible to really know whether the crossing has been properly designed for such a quantity of bed load. There are modeled calculations available but little to know time to make sure the model is properly calibrated to site-specific conditions. Volume of bed load and its transport characteristics can have a broad range of variability both spatially and temporally. Also random events can happen upstream, such as landslides and woody debris jams being breached upstream of a conveyance structure. Both these kind of sediment sources can release unpredictable amounts of sediment as a sudden surge during common flow events that happen much more frequently than 100-yr recurrence interval events. In my opinion, protecting streams from sediment supply from OHV sites during storms less than and up to 100-year recurrence intervals is not constantly possible where structures can become damaged by crushing, lack of maintenance, or rendered non functional by blockage of sediment or woody debris.

One of the striking aspects of the BMPs and the negative declaration is the lack of any discussion of the relative efficacy of the proposed mitigation measures as applied to avoid sediment discharge from OHV routes on National Forests in California. If the BMPs are effective at preventing sediment supply, the review documents should refer to some quantitative measurement that the sediment storage behind waterbars and dissipation structures equals the same volume of soil lost from the erosional voids made from raindrop impact, and rills and gullies on the OHV road and trail tread, as well as the side slope gullies formed at the dissipation structures off the edge of the road. In my opinion, the reason this type of information is *not* presented is because these types of BMP mitigation measures proposed for OHV roads and trails do not avoid significant sediment discharges. As a result, there appears to be no consideration of how effective these measures have been in the past at avoiding significant sediment pollution from OHV routes

In sum, the assumption implied in the review documents that these impacts can be avoided by the proposed mitigation measures is not evaluated or supported and in my experience is unwarranted.

c. The BMPs Allow for New Trails to be Created on Steep Slopes that Will Lead to Significant Water Quality Impacts.

Even for new routes, the BMPs allow for OHV trails on slopes up to 55% steepness, or 45% where the erosion potential is high or extreme. In my opinion, this BMP alone has the potential to lead to significant sediment discharge.

The photos reviewed demonstrate how any OHV trails on a significant slope have the potential to create their own drainage channels, which in turn feed sediment laden flows directly into downslope watercourses. The slopes depicted

in most of the photos are substantially less than 45-55%. Yet the proposed BMPs suggest that future trails could be constructed that replicate these same unstable hillside conditions.

In my opinion, allowing for new trails to be constructed on erodible soils above 15% gradient has the potential for significant water quality impacts due to sediment discharge. Further, in my opinion, it is not clear how the Forest Service could propose that placing trails on "highly erodible" slopes – whatever gradient – will not have significant impacts to water quality. Highly erodible soils will break down with OHV use and the resulting sediment pollution will flow downhill during storm events and inevitably discharge to lower elevation watercourses. In my opinion, any OHV riding on erodible soils with a significant gradient has the potential to lead to significant impacts, which do not appear to have been considered in the review documents for the proposed waiver.

d. The OHV BMP Monitoring Section Does Not Ensure that Significant Sediment Discharges Will be Avoided.

In my opinion, the monitoring BMP proposed for OHVs (Section 4.7.5) is unlikely to avoid significant sediment discharge from OHV activity. As discussed, this section appears to mostly rely on the "Schedule G-Y-R Trail Condition Monitoring" to identify high risk OHV routes. The BMPs envision that such monitoring will occur annually for high risk areas, and that all OHV trails will be monitored at least every three years.

I have reviewed the GYR trail monitoring form and guidelines. In my opinion, this form of monitoring will be ineffective in preventing significant pollutant discharges for several reasons.

First, as discussed above, the OHV trail Monitoring Form (GYR) states "trails rated red are to be repaired or closed within six months." (*See* Exhibit 6, p. A-3.) However, waiting for a period of 6 months allows water quality degradation to continue with no immediate abatement of the condition and with no apparent justification for waiting for such a long time. In my opinion, the failure to immediately close OHV routes rated as "red" has the potential for significant impacts, namely 6 months (at the least) of continued sediment discharge.

Second, as also discussed, nothing in the monitoring section of the BMPs requires any particular action to be taken by the Forest Service in response to the a finding that a trail is causing excessive erosion and should therefore be rated as "red." In practice the Forest Service's response to "red" rated trails appears to be to schedule maintenance activities for some time in the future, but not to close or reroute the trail. *See* Exhibit 7, attached hereto. Thus, although the BMPs state that the Forest Service *may* close routes that pose immediate significant threats to water quality, the Service evidently does not consider excessive erosion – the grounds for a red trail rating – to be a sufficient basis for trail closure, either temporary or permanent. In my opinion, this is a direct result of the lack of any quantitative or qualitative definitions or standards associated with what constitutes a "significant" discharge of sediment. As a result, any

decisions about whether closure is actually needed are not based on any standards but instead are completely subjective. In my opinion, this lack of any definable threshold has the potential for significant water quality impacts, given the Forest Service's apparent preference for keeping these high risk, "red" rated routes open for continuous OHV use.

Third, as discussed, even if specific and effective mitigation options were identified, there is no assurance that such measures will actually be implemented. Instead, the review documents make clear that mitigation will be subject to the availability of adequate staff and funding. In my opinion and experience, if sufficient funds are not available, there is no possibility that significant adverse impacts can be avoided.

Finally, the maintenance and operations section of the BMP proposed for OHVs (Section 4.7.6) states that drainage and erosion control facilities cease to function if they are worn down by continued traffic. In my opinion the 3-year review frequency is potentially too long a period if heavily used areas that are not presently "high risk" have their water bars worn down by heavy usage. In that case, nonfunctioning facilities will potentially have *years* of unabated sediment supply to streams.

The remaining monitoring requirements (including Section 6 of the WQMH) do not appear to require specific monitoring of OHV routes that have the potential to cause adverse water quality impacts. Thus, they do not change my conclusions above that the proposed BMP monitoring will avoid significant impacts to water quality.

4. Review of WQMH Adaptive Management, Section 4

The Forest Service's WQMH relies heavily on adaptive management to avoid significant sediment discharges from different activities generating non-point source pollution. Adaptive management is set forth in Section 4 of the WQMH.

Adaptive management (AM) is based on the principal that there are uncertainties in how to regulate effectively, and that mechanisms for changing regulatory oversight should be built into the system in order to ensure the achievement of regulatory goals. Adaptive management is a structured decision-making process that includes the following components:

1. articulate clear project goals, objectives and success criteria;
2. collect existing knowledge/practices relative to achieving the goals;
3. identify information gaps and related research needs;
4. develop a strategy and apply knowledge and relevant practices toward achieving the clear project goals
5. develop a clearly defined and defensible monitoring program to determine whether the goals/objectives are being achieved;
6. identify pre-defined potential management responses if project goals/objectives are not met;

7. use monitoring data to determine whether success criteria have been met and whether a management response is necessary;
8. reassess and improve practices and reconsider the goals or outcomes.[1]

In my experience, steps 1, 5 and 6 are critical to a successful adaptive management strategy. Here, the WQMH AM strategy does not meet the minimum criteria for either of these steps.

The WQMH adopts a Plan/Do/Check/Act (PDCA) framework for implementing adaptive management. The PDCA framework sets forth a proposed procedure for how adaptive management will function, but lacks any substantive standards that would ensure that significant pollutant discharges will be avoided. Instead, as set forth below, the WQMH AM strategy appears designed to avoid any commitment to taking regulatory action that would ensure that significant pollutant discharges are avoided. In my opinion, this "standardless" approach to adaptive management – as opposed to an approach based on measureable standards and triggers -- will lead to significant impacts because in the end there will be no requirement to take any corrective action that might eliminate problematic OHV routes from ongoing use and damage. This opinion is based on my experience and also on the documents and photos I have reviewed, which demonstrate – in the absence of an effective adaptive management strategy - a historical lack of remedial action on the part of the Forest Service.

a. Failure to identify Clear Project Objectives

The WQMH AM strategy sets forth general project goals, stated as allowing Forest Service activities to be implemented in a manner that protects water quality and beneficial uses. However, the AM strategy provides no specific project objectives that could be relied on to guide the process and ensure that the general project goals can be met.

For an AM strategy to be successful, project objectives must be: 1) specific; 2) measurable; 3) realistic and attainable (physically and economically); 4) directly related to the problem; 5) time specific (i.e., clearly stated when and how long); 6) be tied to specific measurable success criteria.

With respect to OHV pollution impacts, a successful AM strategy would identify specific objectives relating to the reduction of OHV pollution. These would include the identification of what constitutes an OHV route discharging a significant amount of pollution and a goal of eliminating or correcting a certain percentage of those routes over a given period of time.

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[1] *See* Exhibit 8, Sediment Source Control Handbook, Sierra Business Council, Produced in collaboration with the Lahontan Regional Water Quality Control Board and the California Alpine Resort Environmental Cooperative January 2009.

Here, the WQMH AM strategy simply sets forth a set of planning processes, which are to ensure that a set of general goals listed on page 200 – such as meeting Basin Plan water quality objectives -- are being met.

In my opinion, this type of approach is unlikely to lead to corrective regulatory action that will ensure that waiver conditions are being met. Instead, the lack of a true adaptive management strategy – as opposed to the purely process oriented approach proposed in the BMPs – is likely to allow for continuing significant impacts due to continued OHV usage of sediment discharging trails. This is particularly true with respect to OHVs and other activities that have a long history on Forest Service lands of creating pollution discharges that remain uncorrected. The Forest Service has been required to meet Basin Plan goals for decades, yet the pollution continues to occur. In the absence of any standards for action, a theoretical adaptive management procedure becomes a meaningless exercise.

b. Failure to Provide Any Timetable for Corrective Action

The BMPs do not contain any time table for the Forest Service to take corrective action in the event that monitoring demonstrates that OHV trails are discharging excessive sediment. As discussed, the BMPs state that the Forest Service will take "immediate corrective action" where "adverse water quality" effects are occurring, but this vague language does not define what constitutes "immediate" action, nor does it set any measurable standard for what constitutes an adverse water quality effect. As discussed above, the evidence shows that an OHV route may be clearly discharging excessive amounts of sediment, yet remain in operation literally for years without any enforcement. Thus, the lack of a specific timeline for closure or corrective action is likely to lead to significant impacts to due to continued delay as a result of funding or staffing shortfalls.

c. Failure to Provide a Clearly Defined Monitoring Program to Determine Whether the Project Objectives are Being Achieved.

As discussed above and below, the WQMH's proposal for monitoring OHVs and other activities lacks definitive standards to determine whether project objectives are being met.

As discussed above, the GYR trail monitoring system requires the Forest Service to identify routes that may be or are discharging significant amounts of sediment to streams as yellow or red. However, the evidence shows that the Forest Service may fail to identify trails that are clearly discharging sediment during storm events as requiring immediate corrective action under this monitoring protocol. *See* Photos, Exhibit 1. This result would appear to be due to the lack of clear standards under the monitoring protocol.

As an example, the Forest Service's failure to identify the lower Rock Creek trail segment as requiring any corrective action demonstrates that the proposed monitoring protocol is inadequate to ensure that high risk trails are identified and either closed or repaired. Instead, the monitoring standard based

on the identification of red or yellow trails, is not based on any quantitative measures of success or failure which would then require automatic corrective action, including permanent and immediate closure of trails if targets are not met. Clearly the photos discussed above demonstrate that there is not only erosion occurring due to OHV impacts, but that much sediment is delivered to watercourses. These trails were subject to the GYR monitoring system, which however did not lead to any corrective action.

d. Failure to Identify Pre-defined Potential Management Responses Project Objectives Are Not Met.

Perhaps most importantly, the WQMH AM strategy lacks any pre-defined management responses that would ensure that action will be taken to avoid significant pollutant discharges. For example, as discussed, the OHV monitoring section states that the Forest Service is supposed to identify high impact "red" trails through its G-Y-R monitoring system. However, the AM strategy does not provide any defined management response to the identification of an OHV route as a "red" trail discharging significant amounts of pollution.

Instead, as also discussed, the Forest Service retains complete discretion as to whether or which corrective action should be taken. The BMPs (p. 94) refer to implementing monitoring but there is nothing here that requires monitored findings to force funding for fixing problems. If a problem is ignored, unknown quantities of sediment might have been delivered to a stream creating cumulative downstream impacts. Nothing in the AM strategy *requires* a different result. The AM strategy provides no consequences if corrective actions are not taken. The strategy provides no timeline to ensure the problem is corrected or the route closed.

Finally, the AM strategy lacks *any* enforcement mechanism if sediment discharging trails and roads are left in operation, without corrective action due to lack of staff or funding. If funding is the biggest roadblock to fixing identified problem areas – as is demonstrated -- the adaptive management and BMP effort will continue to fail and water quality will continue to be degraded.

5. The Environmental Review Documents Are Not Adequate to Demonstrate that Future OHV Activities on Forest Service Lands Will Not Cause Continuing Significant Impacts to Water Quality.

In my opinion the long-term and cumulative impacts of continued sediment supply to the streams has not been adequately assessed in the environmental review documents for this project. Nothing in these documents would indicate, for example, that the impacts of the continued types of failures that have been demonstrated through just a few photos would not continue to occur throughout the forest. As discussed, the documents provide no analysis or quantitative measurements to demonstrate that eroded sediment has stayed on site and not discharged to watercourses through the application of mitigation measures. The documents lack any analysis or quantitative information to demonstrate that downstream pools and gravel beds downslope of OHV routes have not filled with

fine sediment with accompanying reduced viable aquatic habitat. The documents lack bathymetric surveys of downstream reservoirs to show that rates of sedimentation below such routes have not increased above rates of forest areas without roads or trails. The documents provide no viable trustworthy quantifiable measures that prove that no cumulative water quality impacts will continue to occur.

In conclusion, in my opinion, the BMPs proposed to regulate OHV activities on Forest Service lands lack the requisite triggers and hard standards that would be required to ensure that future OHV riding on trails and roads will not have significant impacts to water quality and beneficial uses in California due to excessive sediment discharge. Instead, based on my review of the BMPs and other evidence reviewed, it is inevitable that significant water quality impacts will continue to occur due to increasing OHV usage on these trails and roads, particularly as funding and available staff are limited in the future.

Sincerely,

Laurel Collins

Exhibit List

1. Photos of Rock Creek trail on El Dorado National Forest
2. Cedar Ridge trail photos on Stanislaus National Forest
3. Five photos showing problematic trails on Stanislaus National Forest
4. Photos of McKinney Creek trail on El Dorado National Forest
5. Photos of Failed Culverts on trails in El Dorado National Forest
6. G-Y-R Monitoring Form
7. Attachment B to 2010 Soil Report from El Dorado National Forest
8. Excerpt from Soil Conservation Handbook , Sierra Business Council

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for modeling sediment transport on unpaved roads using KINEROS2 and dynamic erodibility. Hydrological Processes. 16: 3079-3089.
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AREAS OF EXPERTISE

- Fluvial Geomorphology
- Tidal Wetland Geomorphology
- Sediment Budgeting
- Landslide Mapping
- Landscape Aerial Photo Interpretation
- Geomorphic Effects of Wildfire and Land Use Impacts
- Stream Restoration Design

EDUCATION

University of California, Berkeley B.A., Earth Sciences, 1981

PROFESSIONAL HISTORY

Watershed Sciences, Owner/Director 2001-to date

San Francisco Estuary Institute, Environmental Scientist, 1999-2001

Independent Consultant, Environmental Sciences, 1989-2001

University of California, Staff Researcher, 1984-2001

Lawrence Berkeley

REPRESENTATIVE EXPERIENCE

Ms. Collins has been a geomorphologist since 1981 specializing in fluvial and tidal wetland geomorphology, sediment budgeting, landslide analysis, stream monitoring and mapping, and analysis of geomorphic change from natural and anthropogenic influences, Ms. Collins has conducted sediment budget and source analysis in Sonoma Watershed for the Regional Water Quality Control Board and has served as an Expert Witness for testimony pertaining to Geomorphology.

As Owner/Director of Watershed Sciences consulting firm established 2001, Ms. Collins has been directly involved in the following projects:

- Sediment Source Analysis for development of a TMDL in Sonoma Creek watershed for the Sonoma Ecology Center and the San Francisco Regional Water Quality Control Board.
- Evaluation of impoundments as red-legged from habitat for the Point Reyes National Seashore.
- Development of action plan and methodologies for conducting a sediment budget analysis on Alameda Creek for Alameda County.
- Geomorphic analysis of Crow Creek to assess impacts of land use practices and natural processes for Alameda County.
- Expert Witness for Determination of Natural versus Artificial conditions of the Mitchell Slough of the Bitterroot River, Montana, for Doney, Crowley, Bloomquist, Payne, Uda PC.
- Sediment source evaluation and conceptual plans for reducing sedimentation in Eden Creek for Alameda County.
- A sediment source analysis and sediment budget in Sonoma Watershed for the Regional Water Quality Control Board and subcontractor for the Sonoma Ecology Center.
- Assessment of flooding and geomorphic change in the lower Sonoma Creek Watershed for the Coastal Conservancy and Southern Sonoma Resource Conservation District.
- Geomorphic assessment of long-term processes associated with the maintenance of red–legged frog breeding habitat of Point Reyes National Seashore, U.S.N.P.S.
- Geologic and geomorphic mapping of Strawberry Canyon

Laboratory, Senior Research Associate, 1992-1993

East Bay Regional Park District, Resource Analyst 1983-1986, Geologist, 1986-1991

Center for Natural Resource Studies, John Muir Institute, Environmental Scientist, 1980-1983

U.S. Geological Survey, Hydrologic Field Assistant, 1980-1982

California Department of Forestry, Field Assistant, 1979-1980

California Academy of Sciences, Paleontology Department Student Assistant, 1978.

AFFILIATIONS

American Geophysical Union, 1986-to date

Geological Society of America, 1983-2001

California Forrest Soils Council, 1980-1991

TEACHING

Watershed Analysis, Sierra Nevada Field Station, San Francisco State, 1998-2003
Hydrology Summer Field Course, Teton

in Berkeley, California, for the Committee to Minimize Toxic Waste and Urban Creeks Council.

- Development of conceptual plans for restoration and geomorphic analysis of lower Wildcat Creek for City of San Pablo and Urban Creeks Council.
- Preliminary assessment of opportunities and constraints for restoration and fish barrier removal in lower Ignacio Creek (Arroyo San Jose), Marin County for Friends of Ignacio Creek and City of Novato.
- Survey of longitudinal profile of lower Carriger Creek, Sonoma County, for the Southern Sonoma Resource Conservation District.
- Geomorphic analysis of silvicultural impacts on sediment supply of Sulphur Creek, Plumas County, for the U.S.F.S. and Plumas Corporation.
- Geomorphic analysis of lower Carriger Creek for the Klamath River Information System, William Kier Associates.
- Stratigraphic analysis, carbon dating, and history of geomorphic change at Last Chance Creek near Stone Dairy, Plumas County for the Plumas Corporation.

As Geomorphologist for the San Francisco Estuary Institute, Ms. Collins:

- Developed of a "Watershed Science Approach" for field methodologies to assess and analyze changes in the delivery of water and sediment as affected by Euro-American land use practices in California.
- Conducted a scientific study of physical processes and land use impacts in Wildcat Creek, Contra Costa County, for the San Francisco Estuary Institute. Developed a field-based methodology for quantifying natural versus man-related sediment supplies.
- Applied the Watershed Science Approach to San Antonio Creek, Marin County, for the Southern Sonoma Resource Conservation District.
- Applied the Watershed Science Approach to Carriger Creek, Sonoma County for the Southern Sonoma Resource Conservation District.

As an Independent Consultant, Ms. Collins was served as the following:

- Consulting Geomorphologist for the Napa Resource Conservation District to establish and help educate different stewardship groups and to develop protocols to collect data on stream geometry to monitor channel change.
- Consulting Fluvial Geomorphologist Geomorphology Consultant for AECOS and Institute for Sustainable

Science School, 1991 and 1996

SCIENTIFIC ADVISORY BOARDS

Technical Advisory Committee for Management of Lagunitas Creek, Marin Municipal Water District

South Bay Salt Pond Restoration Project, Sediment Workshop Leader, County of Alameda

Science Review Group for Napa Watershed Project of the San Francisco Estuary Institute

Pescadero Creek Technical Advisory Committee, San Mateo Resource Conservation District

San Pablo/Wildcat Technical Design Advisory Council, City San Pablo

Hill Area Fuel Reduction Committee, University of California at Berkeley

Mayors Task Force of Forestry and Vegetation, City of Oakland

Development to conduct a watershed analysis for Waimanalo Creek, Waimanalo, and Mokapu Channel, Marine Corps Base, Oahu.

- Fluvial and Tidal Geomorphology Consultant for Marin County Flood Control District to conduct a watershed analysis of Novato Creek, Marin County, with special focus on sedimentation and sediment sources to the Novato Flood Control Project.
- Fluvial Geomorphology Researcher contracting with the Point Reyes National Seashore, to conduct research and monitoring of the second and third year hydrologic and geomorphic effects of the 1995 Vision Fire on Muddy hollow Creek, Marin County.
- Fluvial Geomorphology Researcher for the West Marin Environmental Action Committee to conduct research and monitoring of the first year effects of the 1995 Vision Fire in the Inverness Ridge, Marin County.
- Teacher with Dr. Luna B. Leopold and Dr. Scott McBain for the Teton Science School, Jackson, Wyoming at the Hydrology Workshop on fluvial hydrology, field methods and watershed analysis.
- Fluvial Geomorphology Consultant to U. S. Department of Justice for research on Reserved Water Rights Case on the effects of water diversion on the Fraser River, Lostman Creek, and Indian Creek, Colorado, plus expert testimony.
- Fluvial Geomorphology Consultant to EA Engineering, to perform watershed analyses for a 100-Year Sustained Yield Program for the Noyo River, Mendocino County. Analyses included documentation of channel conditions, determining impacts of logging upon hydrology and fluvial geomorphology of coho salmon habitat, sediment production and landsliding; and advising policy makers on ways to reduce future impacts from timber harvesting.
- Fluvial Geomorphology Consultant to U.S.F.S., to determine the Holocene and recent geomorphic history of the South Fork Kern River in Monache Meadows, Southern Sierra Nevada, Inyo National Forest. Analysis was conducted of flood frequency; channel incision and sediment transport regimes and related to climate change and land use practices for the last 200 years.
- Geomorphology Consultant to law firm of Lossing and Elston, San Francisco, to prepare expert testimony on the effects of fire upon slope stability, landsliding, runoff and erosion.

As a Staff Researcher in the Department of Geology and Geophysics, University of California at Berkeley, Ms. Collins was involved with the following:

- Fluvial geomorphology research for the Pacific Southwest Forest and Range Experiment Station, U.S.F.S. to produce detailed stream maps, longitudinal profiles, and cross sections within and outside of cattle exclosures in the Golden Trout Wilderness, Inyo National Forest, California.
- Tidal marsh geomorphology and hydrology research in the Petaluma Marsh, Sonoma County.
- Fluvial hydrology research on braided channels in regions of Wyoming and Idaho.
-

Senior Research Associate for Lawrence Berkeley National Laboratory to conduct geologic field mapping, analysis and report preparation of site characteristics for the LBNL Hazardous Waste Handling Storage Facility in Strawberry Canyon, Berkeley, California.

Teacher for San Francisco State Sierra Nevada Field Station for undergraduate course in stream restoration, watershed analysis, and stream monitoring techniques.

District Geologist for East Bay Regional Park District, Oakland, Ca. Responsibilities included identification and analysis of geological hazards; direction of geologic and hydrologic research programs; publication of research findings; formulation of District policy pertaining to fuel break management, and resource management relative to hydrologic and geologic issues; preparation of expert testimony; preparation and review of Environmental Impact Reports; assessment and restoration of steelhead habitat in Wildcat Creek, Berkeley Hills.

Geologist/Hydrologist for the Center for Natural Resource Studies, John Muir Institute, Inc., Berkeley, to conduct field study and analysis of flood effects and instream flow requirements of San Lorenzo River, Santa Cruz, California; assessment of geologic hazards and evaluation of fish habitat Grider Creek, Klamath National Forest; assessment of cumulative impacts of silvicultural practices in the Sierra National Forest; assessment of the effects of silvicultural practices on site productivity in California forest lands; and publication of research findings.

Hydrologic Field Assistant, for Water Resources Division, US Geological Survey, Menlo Park, to conduct field study and analysis of 1) earthflows in Redwood National Park, California; 2) river morphology as effected by volcanic activity, Mt. St. Helens, Washington; 3) interactions among hillslope and stream processes in the San Lorenzo

River, Santa Cruz, California; and 4) publication of findings.

Student Assistant for the California Department of Forestry, Sacramento, to conduct field study and analysis of the effects of logging activities and the effectiveness of the Forest Practice Regulations on rates of erosion in private forest lands throughout California.

Student Assistant for Geology Department, California Academy of Sciences, San Francisco assisting with the curation of fossil genera of ammonites and echinoids for Dr. Peter Rhoda.

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13. Booker F.A., W.E., Dietrich, and L.M. Collins, 1995. The Oakland hills fire of October 20, 1991, an evaluation of post-fire response, in Brushfires in California wildlands: ecology and resource management, Keeley, J.E., and Scott, T., eds., published by International Association of Wildland Fire, p. 220.
14. Collins, L.M. and C.E. Johnston, 1995. The Effectiveness of Straw Bale Dams for Erosion Control in the Oakland Hills Following the Fire of 1991, in Brushfires in California wildlands: ecology and resource management. Jon E. Keeley and Tom Scott (eds.), published by International Association of Wildland Fire. 14 pp.
15. Collins, L.M., T. Gaman, R. Moritz and C.L. Rice, 1996. After the Vision Fire: Restoration, Safety and Stewardship for the Inverness Ridge Communities, published by Environmental Action Committee of West Marin, 84 pp.
16. Collins, L.M. and B. Ketcham, 1997. Rills and Hoodoos, Tree Falls, Debris Dams and Fans, in Burning Issues in Fire Management, special Fire Research Document, published by Point Reyes National Seashore, National Park Service, Department of Interior. 4 pp.
17. Collins, 1998. Sediment Sources and Fluvial Geomorphic Processes of Lower Novato Creek Watershed *for* the Marin county Flood Control and Water Conservatiojn District. 120 pp.
18. Collins, L.M., J. Collins, R. Grossinger, and A. Riley, 2001. Wildcat Creek Watershed, A Scientific Study of Physical Processes and Land use Effects. A report by the San Francisco Estuary Institute, 2001.
19. Collins, L.M. Watershed Restoration Strategies, in Science and Strategies for Restoration, San Francisco Bay Sacramento San Joaquin River Delta Estuary, San Francisco Estuary Project and CALFED, October 2001, State of the Estuary Conference Proceedings, pp 55-58.
20. Collins, Laurel, January, 2004. Preliminary Assessment for Restoration and Fish Barrier Removal Lower Ignacio Creek (Arroyo San Jose), Marin County prepared for Friends of Ignacio Creek.

21. Collins, L.M., and B. Ketcham, 2005. Fluvial Geomorphic Response of a Northern California Coastal Stream following Wildfire, Point Reyes National Seashore, in Vision Fire, Lessons Learned from the 1995 Fire by National Park Service, U.S. Department Interior, Point Reyes National Seashore, California.
22. Dietrich, W.E., P.A. Nelson, E. Yager, J.G. Venditti, M.P Lamb and L. Collins, 2005. Sediment Patches, Sediment Supply, and Channel Morphology in Proceedings of 4th Conference in River , Estuarine, and Coastal Morphodynamis, A.A. Balhema Publishers, Rotterdam.
23. Collins, Laurel, July 2006. Mitchell Ditch Summary Opinions prepared for Doney, Crowley, Bloomquist, Payne, Uda PC.
24. Collins, Laurel, March 2007. Geomorphic and hydrologic Assessment of Fernandez Ranch prepared for Restoration Design Group and Muir Heritage Land Trust.
25. Sonoma Ecology Center, Watershed Sciences, Martin Trso, Talon Associates, and Tessera Consulting, October 2006. Sonoma Creek Watershed Sediment Source Analysis prepared for San Francisco regional Water Quality Control Board.
26. Collins, Laurel, March 2007. Contaminant Plumes of the Lawrence Berkeley National Laboratory and their Interrelation to Faults, Landslides, and Streams in Strawberry Canyon, Berkeley, and Oakland, California prepared for The Committee to Minimize Toxic Waste, Berkeley California.
27. Collins, L.M. and J.N. Collins, in progress 2007. Red-legged Frog Landscapes: Geomorphic Assessment of Historical Impoundments and Native Drainage Conditions in Relation to Possible Breeding Habitat for the California Red-legged Frog in the Phillip Burton Wilderness Area, Point Reyes National Seashore, prepared for US National Park Service, Point Reyes National Seashore.
28. Collins, Laurel, in progress 2007. Geomorphic Analysis of Land Use Impacts in Crow Creek, Alameda County, California prepared for The Alameda County Flood Control and Resource Conservation District.

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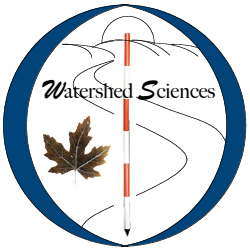

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TECHNICAL MEMO ON REVIEW OF Lahontan Waiver and MOU
Laurel Collins, November 25, 2008

Dear Mr. Graf,

At your request, I have reviewed technical information regarding the potential impacts of the proposed Waiver of Waste Discharge Requirements (Waiver) and Memorandum of Understanding (MOU) between the Lahontan Regional Water Quality Control Board ("Lahontan") and the Tahoe Regional Planning Agency (TRPA).

I have been a geomorphologist since 1981 specializing in fluvial, hillslope, and tidal wetland geomorphology, sediment budgeting, landslide and stream mapping, and analysis of geomorphic change from natural and anthropogenic influences. My experience on the issues raised by the Waiver and MOU is based on my work on various sediment source assessment and monitoring projects for the US Forest Service, California Department of Forestry, US National Park Service at Point Reyes National Seashore, San Francisco Bay Regional Water Quality Control Board, Alameda County, Marin County, Contra Costa Clean Water Program, and the East Bay Regional Park District. I am the Owner/Director of Watershed Sciences consulting firm, which I established in 2001. Attached to this review is a copy of my current CV. A few examples of my experience follow.

For the California Department of Forestry (CDF) I was involved in a 5-year monitoring project for the Board of Forestry to assess the effectiveness of forest practice rules that were developed specifically to reduce erosion and sediment supply to streams in areas that had various silvicultural practices, ranging from clearcutting to selective helicopter logging. At numerous 10-acre study sites located throughout private and public California forestlands, effectiveness monitoring of erosion control practices was conducted by measuring sediment trapped behind erosion control structures (such as water bars and dissipation structkures), by measuring the size of voids created by landslides, gullies, rills, and from failed road crossings associated with logging roads and tractor trails. Data were collected yearly, statistically analyzed, and total sediment supply on logged sites was compared to that from study sites that served as controls, where no silvicultural practices had been previously conducted. Photo monitoring was an integral component of monitoring and used to document and verify conditions.

As a separate project later contracted by the CDF, I was a co-author of a report on a cautionary review of the effects of silvicultural activities on site quality. The report dealt particularly with the impact of logging on nutrient cycling and mass wasting.

For the Pacific Southwest Forest and Range Experiment Station, I established ten long-term monitoring sites of channel and erosion conditions in the in the Golden Trout Wilderness, Inyo National Forest, California. I produced detailed stream maps, with quantitative data on sediment size classes, longitudinal profiles, cross sections, and a methodology for monitoring and assessing future change.

For The Point Reyes National Seashore I monitored post fire sediment production and runoff following the 1995 Vision Fire. This involved stream gaging, measurement of sediment deposition in a developing alluvial fan, assessment of hydrophobic soil conditions, and monitoring stream and landscape response for over three years. Similarly, following the 1991 Tunnel fire in the Oakland Hills, California, I monitored erosion and sediment production as influenced by fire, as well as by post fire erosion control activities.

For Alameda County, I developed a preliminary sediment budget for Alameda Creek and protocols for developing a sediment budget by monitoring sediment load at key gaging stations along the stream network. Recently for the San Francisco Regional Water Quality Control Board, I developed a methodology and performed an analysis of sediment sources and determined long-term sediment supply rates from the stream and hillsides of the nearly 100 sq mi Sonoma watershed for a TMDL (total maximum daily loads) analysis of fine sediment.

As part of this review, I have assessed the terms of the existing waiver for the Lahontan region enacted in February 2007, the proposed Waiver and MOU with TRPA, and other documents relating to the procedures that TRPA and the U.S. Forest Service will likely utilize in making assessments of project impacts on water quality. In particular, I have reviewed the monitoring requirements that accompany each of the different regulatory schemes by Lahontan, TRPA and the Forest Service.

1. Review of Existing Lahontan Waste Discharge Waiver and Monitoring Requirements

The existing Lahontan waiver applies to five categories of timber harvest and vegetation management activities. Category One projects are considered “minor timber harvest” activities. For projects that fall within this category, the existing Lahontan waiver does not generally require monitoring. For Category Two through Five projects, the Lahontan waiver requires implementation and effectiveness and forensic monitoring. If a project meets a number of criteria, the Lahontan waiver only requires implementation monitoring. These criteria include no constructed watercourse crossings, no ground based equipment operations

within stream zones or on slopes over 30%, no winter operations and no road or landing construction within 500 feet of stream zones.

Conversely, if a project contains any of these criteria, effectiveness and forensic monitoring is required. In this way, the existing Lahontan waiver recognizes the potential for projects with one or more of these criteria to discharge significant amounts of sediment into watercourses and the need for effectiveness and forensic monitoring to ensure that mitigation measures put in place to avoid these impacts are functioning effectively.

The Lahontan waiver requires all dischargers under waiver categories 2-5 to prepare and submit to Lahontan an Inspection Plan for conducting implementation, forensic and effectiveness monitoring. The Inspection Plan shall be designed to ensure that the management measures are installed and functioning prior to precipitation events (Implementation monitoring), that the measures were effective in controlling sediment discharge sources throughout the winter period (Effectiveness monitoring), and that no new sediment sources occur as a result of project implementation (Forensic monitoring).

The Inspection Plan shall include a monitoring point site map, which shall include visual and photo-point monitoring points. Forensic photo-point monitoring shall include photos of sediment sources and streambed conditions immediately downstream of areas where sediment discharge occurred.

Implementation monitoring requires a discharger to take pre-project photos as specific locations to facilitate comparison of pre- and post- project site conditions. Implementation monitoring requires a pre-winter inspection following completion of the project to assure that mitigation measures are in place and secure prior to the winter period. Where winter operations are conducted, an implementation inspection shall be completed immediately following cessation of winter operations to assure that management measures are in place and secure.

If implementation monitoring reveals that management measures were not installed, or were installed but are determined to be ineffective, the discharger shall document the problem and any corrective actions to ensure that the project is in compliance with the applicable Waiver criteria and conditions.

The existing waiver also requires forensic monitoring, which shall be conducted during the winter period. Forensic monitoring requires sites to be inspected and photographs shall be taken (as outlined in the Inspection Plan that was submitted with the Waiver application) following storm events based on significant amounts of precipitation. The goal of winter forensic monitoring is to locate sources of sediment delivery (or potential delivery) in a timely manner so that rapid corrective action maybe taken where feasible and appropriate. Winter forensic monitoring may also assist in determining cause and effect relationships between hillslope activities, hydrologic triggers and instream conditions. Forensic monitoring may be waived upon written notification from the discharger that significant environmental impacts would result from road system use in wintertime to access the visual and photo-point monitoring sites.

Forensic monitoring requires photos at locations when a significant discharge of sediment is detected or when failed management measures cause or may cause the release of 3 cubic yards (or more) of sediment to watercourses. Photos of the stream and sediment source are also required where visible sediment deposits in a streambed are observed.

The waiver relies on forensic monitoring to correct ongoing problems with the effectiveness of mitigation measures installed to avoid adverse water quality impacts. The waiver states that follow-up forensic monitoring inspections and photo-point monitoring shall be conducted weekly until corrective action is completed to repair or replace failed management measures and/or significant sediment discharges have ceased. Sites that are determined to be sediment sources during forensic monitoring shall be photographed prior to and following corrective action being implemented at the site.

The waiver also requires effectiveness monitoring to be conducted as soon as possible following the winter period. Effectiveness monitoring “shall be designed to determine the effectiveness of management measures in controlling discharges of sediment and in protecting water quality” and to “help to determine whether Waiver criteria and conditions, on a programmatic scale, are adequately protecting water quality and instream beneficial uses.”

The Effectiveness monitoring inspection shall include visual inspection and photo documentation of sites identified in the Inspection Plan. If the visual inspection reveals a significant management measure failure, a visual inspection of instream components (bank composition and apparent bank stability, water clarity and instream sediment deposition)'shall also be conducted and the conditions shall be documented.

Effectiveness monitoring shall continue until the discharger submits a Final Certification compliance report to Lahontan demonstrating that the projected and any necessary mitigation measures were completed in compliance with the waiver and all requirements of the applicable water quality control plan. The waiver also requires semi-annual reporting. Dischargers shall submit an Implementation Monitoring Report on January 15 of each year, and an Effectiveness Monitoring Report on July 15 of each year.

In my opinion, the monitoring conditions contained in this waiver help to ensure that high risk projects do not lead to significant discharges of sediment and other pollutants. For monitoring to be effective, it must be timely and verifiable and must contain a mechanism that ensures that problems are corrected as soon as they are identified in the monitoring process. Each of these components are present in the existing waiver. In my opinion, the repeal of these components has the potential for substantial impacts on water quality because there may no longer be an effective mechanism to verify that mitigation designed to avoid pollutant discharge has been successful, or if not, has been immediately corrected.

2. Proposed Waiver and MOU for the Basin

As part of this assessment, I have also reviewed Lahontan's proposed Waiver and MOU, in which Lahontan proposes to transfer primary authority for managing the waiver program in the Lake Tahoe Basin to the TRPA. My understanding from these documents is that the monitoring requirements described above in Lahontan's existing waiver will no longer apply in the Basin. Instead, I understand that monitoring will be primarily the job of TRPA.

As discussed below, the proposed Waiver and MOU do not discuss the monitoring that would be conducted by TRPA in any detail. There is no discussion of what percentage of area that will be monitored, what the guidelines will be for determining whether more forensic monitoring will be necessary, and what the quantitative threshold or qualitative description is for "significant" damage to soil or vegetation. In my opinion, these issues raise serious concern that monitoring of future fuel reduction and silvicultural activities will be inadequate to ensure that mitigation measures designed to avoid substantial pollutant discharge have been implemented and are effective, or, if not effective, will be quickly corrected. Furthermore, it is not clear what level of qualifications will be required of TRPA individuals reviewing monitoring reports, establishing remediation requirements, or developing adaptive management requirements. Mostly, without rigorous protocols for quantitative effectiveness and forensic monitoring it might be impossible to establish cause and effect of site deterioration or the linkages between impacts caused by land management activities versus those that are natural. Without this kind of information remediation efforts can often be useless or lead to more costly problems.

As discussed above, the existing Lahontan Waiver requires relatively comprehensive implementation, forensic and effectiveness monitoring for timber and fuel reduction projects falling within Categories 2-5 and not meeting all of the exemption criteria. These exemption criteria identify types of projects that have the potential for significant discharges of sediment due to steep slopes, sensitive and unstable areas (i.e., stream zones), sensitive times of year and use of heavy and/or ground-based equipment.

Below I provide my review of the potential for these types of fuel reduction activities to have significant environmental impacts, and discuss the effectiveness of TRPA monitoring requirements to ensure that such impacts are minimized or avoided through the implementation of effective mitigation/best management practices. As set forth below, in my opinion, the TRPA monitoring program does not require monitoring for the same scope of projects as is required by Lahontan's existing waiver. Further, the TRPA code sections do not provide enough information for me to analyze the effectiveness of TRPA's monitoring requirements that do apply. For that reason, the proposed Waiver and MOU, by eliminating the existing monitoring requirements, have the potential for significant environmental impacts because discharges that do occur due to higher risk activities are likely to not be identified and corrected in a timely manner.

3. Potential for Impacts Due to Logging or Fuel Reduction Activities in Sensitive Areas

In my experience working in the Sierra Nevada, I have observed that the logging activities on steep slopes and within stream zones have the potential to discharge substantial amounts of sediment. This is particularly true where heavy equipment is used, especially in areas with decomposed granitic bedrock and/or granitic soils that have abundant fine sediment, often referred to as grus. Following fire, but even before the first rainfall, natural sediment supply rates into streams can be quite high from dry ravelling of soil from the inner gorge of stream canyons. After rainfall, especially in areas that have hydrophobic soils, pervasive rill networks can occur over vast portions of the hillsides that can directly supply fine surface soils to the stream network. Without effectiveness and forensic monitoring, these natural geomorphic responses might be difficult to distinguish from man-related project causes in areas that are treated for post fire erosion control.

Effectiveness and forensic monitoring is needed to determine the influences of large events such as rain on snow events that have been shown to produce some of the largest flood impacts in the Sierra. In these extreme conditions, it will be important to establish if BMPs and other erosion control remedies are able to perform. In my opinion, the absence of such monitoring could lead to substantial amounts of sediment discharge in flooding events because the problems would not be identified in a timely manner.

In areas that are or are not effected by fire that are undergoing fuel reduction activities and even on slopes less than 50 percent (as designated in the proposed Waiver on page 2 of Attachment A), mechanical disturbance of the soil surface can destroy the added soil cohesion that is provided by the fine roots of vegetation (Booker Dietrich and Collins,1993) (see CV for cited references). This added soil cohesion is particularly critical in steep areas that are often found in or near (within 500 feet of) stream environment zones. With just light mechanical disturbance and creation of bare soils, some soils will create a series of rill networks similar to hydrophobic soils, especially during intense rainfall. These rill networks might later be covered by snow or destroyed as vegetation recovers. Without effectiveness and forensic monitoring, these land use-related sediment sources might go undetected yet create significant negative impacts.

After logging, thinning, salvage operations, or other fuel modification activities that cut trees there is a subsequent loss in soil strength to resist surface erosion and landsliding. This is caused by the decay and loss of small and large roots. For example, studies have shown that large roots of conifers decay in about 5-7 years (Coats and Collins, 1981). This is before roots of germinated seedlings can contribute significant added cohesion. At this point, forest soils dominated by conifers can be at their weakest to resist mass wasting from landslides. Continued monitoring beyond a five-year time frame is needed to capture the potential effects of these land use practices, otherwise significant negative impacts caused by land management might go undetected. These kinds

of impacts that provide fine sediment to any portion of the stream network, even along small headwater ephemeral channels can influence any particular designated “class” or size of downstream channel. This means that distance limits of 500 ft on the proximity of a Class I, II, or IV watercourses might not be effective.

It is important to note that even the process of implementing erosion control practices or the structures or applications themselves can sometimes be more damaging than if nothing had been done. For example, following the Tunnel Fire in the Oakland Hills, hydro mulching reduced vegetation recovery from soil disturbance, hay bale check dams in small water courses increased sediment production and delivery to streams, and on landslides hay bales increased the potential for landsliding by increasing the amount of soil saturation, and trampling by foot and mechanical disturbance of the soil during applications of erosion control caused the break down of the fine root network in the surface soils that lead to increased surface erosion from the development of rills and gullies (Collins and Johnston, 1995; Booker, Dietrich, and Collins, 1995). Trained experts are required to assess where erosion control remediation is necessary or could be potentially detrimental.

4. Comparison of TRPA Monitoring Requirements with Existing Waiver Monitoring Requirements

As part of this assessment, I have reviewed the TRPA code sections that address monitoring requirements. The only specific monitoring requirement contained in these code sections appears limited to tree cutting projects conducted in Stream Environment Zones (SEZs) using “innovative technology” vehicles and/or “innovative techniques” for the purpose of fire hazard reduction. *See* TRPA Code § 71.4.C.1.b.viii. However, in my experience there are other types of fuel reduction activities besides vehicle use in SEZs that have the potential for sediment discharge, including logging on steep slopes or within 500 feet of SEZs, or construction of roads and landings as a part of logging operations that have the potential for substantial soil displacement.

My reading of this code section also raises further concerns, to the extent that the Regional Board is assuming that the monitoring described in this section will avoid adverse water quality effects. As discussed above, for monitoring to be effective, it must be timely and verifiable and must contain a mechanism that ensures that problems are corrected as soon as they are identified in the monitoring process.

The existing Lahontan waiver attempts to achieve the requirement that monitoring be timely in a number of ways. First, it requires that implementation monitoring be conducted immediately after project completion to ensure that BMPs have been properly put in place. Second, the wavier requires forensic monitoring conducted immediately after major storm events, which test the adequacy of mitigation measures designed to protect water quality. Third, the existing waiver requires comprehensive effectiveness monitoring following the

winter season after the project has been completed and the BMP mitigation has been put in place.

The Lahontan waiver also is verifiable through its requirement of photo-point monitoring at the pre-project, post-project implementation, and forensic and effectiveness monitoring stages. Photo-monitoring ensures that the regulating entity – in this case Lahontan – maintain some ability to review the effectiveness of the waiver conditions and the BMPs that are being implemented to avoid adverse effects on water quality. In my experience, without this type of verification process, there is no way for an agency to ensure that BMPs are being adequately implemented and operating effectively.

Quantitative measurements can be conducted from photos when pictures are taken from the same vantage point and especially when something can be uses as a scale, such as a survey rod. This was done in a project for Marin County where quantitative estimates of sediment supply from stream downcutting and bank erosion could be conducted from measurements made in the field and from photos taken 15 years earlier in Novato Creek (Collins, 1995). Protocols for adaptive management and reproducible quantitative assessment seem to be missing within the proposed waiver.

Finally, the existing waiver has specific triggers to ensure that when BMPs have not been adequately implemented or are not operating effectively over time, the problems that are identified must be corrected, and that more intensive monitoring shall occur until that has been accomplished.

In contrast to these specific requirements, in my review of the TRPA code sections, I did not see any description of how TRPA would conduct monitoring for fuel reduction projects. The Code section states only monitoring will be required to ensure that fuel reduction projects in SEZs will not cause significant adverse impacts on water quality. However, in my opinion, the requirements of the existing Lahontan waiver represent a minimum level of monitoring that would be necessary to meet this objective. For example, were TRPA only to require implementation monitoring, and not project specific forensic and effectiveness monitoring, this would not ensure that adverse impacts would be avoided because mitigation measures put in place after logging projects are completed often fail or are not effective in avoiding sediment discharge.

Many erosion control projects have created sediment sources, rather than reduce them. Examples are sited in the post fire monitoring of the Tunnel Fire (Collins and Johnston, 1995). Data collected on the effectiveness of straw bale check dams at trapping sediment and preventing it from entering channel systems were shown to be only 50% effective at the Tunnel Fire (Booker, Dietrich, and Collins, 1993) and 60 percent effective at the 1993 Laguna Beach Fire (Collins and Johnston, 1995). If effectiveness and forensic monitoring does not occur it will be impossible to assess and ameliorate negative impacts.

Without verifiable compliance using such techniques as pre and post project photo monitoring points, it is not possible for a regulatory agency to

ensure that adverse impacts to water quality are being avoided. Ideally, reproducible quantitative measurements of erosion sites should be made to establish the amount and size of the sediment supplied to the stream system and should be accompanied by qualitative information that assigns sediment supply to different source types and establishes cause and effect. Without this, there can not be sufficient adaptive management.

Finally, I observe that the proposed waiver and MOU set forth various means for Lahontan to be notified in the event a party violates the term of any permit or project authorization. In my opinion, this is not an adequate substitute for an effective monitoring program because projects may often be implemented according to the terms of the permit, yet still cause substantial discharge due to failed mitigation, or due to the application of measures that were inappropriate for the physical conditions on the ground. In my experience, coordination and discussion between the agencies will not ensure protection of water quality in the absence of a detailed monitoring program providing ongoing data about the effectiveness of mitigation that is implemented and whether water quality is being adversely affected.

Because the background documentation for the proposed Waiver and MOU contain no discussion of what types of monitoring will occur, it is impossible for me to compare what the effects of the proposed Waiver/MOU may be on water quality in the Tahoe Basin. However, in my opinion, Lahontan's repeal of its existing waiver and corresponding monitoring requirements for high risk projects has the potential for significant impacts on water quality in the Basin.

Sincerely,

Laurel Collins

AREAS OF EXPERTISE

- Fluvial Geomorphology
- Tidal Wetland Geomorphology
- Sediment Budgeting
- Landslide Mapping
- Landscape Aerial Photo Interpretation
- Geomorphic Effects of Wildfire and Land Use Impacts
- Stream Restoration Design

EDUCATION

University of California, Berkeley B.A., Earth Sciences, 1981

PROFESSIONAL HISTORY

Watershed Sciences, Owner/Director 2001-to date

San Francisco Estuary Institute, Environmental Scientist, 1999-2001

Independent Consultant, Environmental Sciences, 1989-2001

University of California, Staff Researcher, 1984-2001

Lawrence Berkeley Laboratory, Senior Research Associate,

REPRESENTATIVE EXPERIENCE

Ms. Collins has been a geomorphologist since 1981 specializing in fluvial and tidal wetland geomorphology, sediment budgeting, landslide analysis, stream monitoring and mapping, and analysis of geomorphic change from natural and anthropogenic influences, Ms. Collins has conducted sediment budget and source analysis in Sonoma Watershed for the Regional Water Quality Control Board and has served as an Expert Witness for testimony pertaining to Geomorphology.

As Owner/Director of Watershed Sciences consulting firm established 2001, Ms. Collins has been directly involved in the following projects:

- Sediment Source Analysis for development of a TMDL in Sonoma Creek watershed for the Sonoma Ecology Center and the San Francisco Regional Water Quality Control Board.
- Evaluation of impoundments as red-legged from habitat for the Point Reyes National Seashore.
- Development of action plan and methodologies for conducting a sediment budget analysis on Alameda Creek for Alameda County.
- Geomorphic analysis of Crow Creek to assess impacts of land use practices and natural processes for Alameda County.
- Expert Witness for Determination of Natural versus Artificial conditions of the Mitchell Slough of the Bitterroot River, Montana, for Doney, Crowley, Bloomquist, Payne, Uda PC.
- Sediment source evaluation and conceptual plans for reducing sedimentation in Eden Creek for Alameda County.
- A sediment source analysis and sediment budget in Sonoma Watershed for the Regional Water Quality Control Board and subcontractor for the Sonoma Ecology Center.
- Assessment of flooding and geomorphic change in the lower Sonoma Creek Watershed for the Coastal Conservancy and Southern Sonoma Resource Conservation District.
- Geomorphic assessment of long-term processes associated with the maintenance of red–legged frog breeding habitat of Point Reyes National Seashore, U.S.N.P.S.
- Geologic and geomorphic mapping of Strawberry Canyon in Berkeley, California, for the Committee to Minimize Toxic Waste and Urban Creeks Council.
- Development of conceptual plans for restoration and

1992-1993

East Bay Regional Park District, Resource Analyst 1983-1986, Geologist, 1986-1991

Center for Natural Resource Studies, John Muir Institute, Environmental Scientist, 1980-1983

U.S. Geological Survey, Hydrologic Field Assistant, 1980-1982

California Department of Forestry, Field Assistant, 1979-1980

California Academy of Sciences, Paleontology Department Student Assistant, 1978.

AFFILIATIONS

American Geophysical Union, 1986-to date

Geological Society of America, 1983-2001

California Forrest Soils Council, 1980-1991

TEACHING

Watershed Analysis, Sierra Nevada Field Station, San Francisco State, 1998-2003
Hydrology Summer Field Course, Teton Science School, 1991 and 1996

geomorphic analysis of lower Wildcat Creek for City of San Pablo and Urban Creeks Council.

- Preliminary assessment of opportunities and constraints for restoration and fish barrier removal in lower Ignacio Creek (Arroyo San Jose), Marin County for Friends of Ignacio Creek and City of Novato.
- Survey of longitudinal profile of lower Carriger Creek, Sonoma County, for the Southern Sonoma Resource Conservation District.
- Geomorphic analysis of silvicultural impacts on sediment supply of Sulphur Creek, Plumas County, for the U.S.F.S. and Plumas Corporation.
- Geomorphic analysis of lower Carriger Creek for the Klamath River Information System, William Kier Associates.
- Stratigraphic analysis, carbon dating, and history of geomorphic change at Last Chance Creek near Stone Dairy, Plumas County for the Plumas Corporation.

As Geomorphologist for the San Francisco Estuary Institute, Ms. Collins:

- Developed of a "Watershed Science Approach" for field methodologies to assess and analyze changes in the delivery of water and sediment as affected by Euro-American land use practices in California.
- Conducted a scientific study of physical processes and land use impacts in Wildcat Creek, Contra Costa County, for the San Francisco Estuary Institute. Developed a field-based methodology for quantifying natural versus man-related sediment supplies.
- Applied the Watershed Science Approach to San Antonio Creek, Marin County, for the Southern Sonoma Resource Conservation District.
- Applied the Watershed Science Approach to Carriger Creek, Sonoma County for the Southern Sonoma Resource Conservation District.

As an Independent Consultant, Ms. Collins was served as the following:

- Consulting Geomorphologist for the Napa Resource Conservation District to establish and help educate different stewardship groups and to develop protocols to collect data on stream geometry to monitor channel change.
- Consulting Fluvial Geomorphologist Geomorphology Consultant for AECOS and Institute for Sustainable Development to conduct a watershed analysis for Waimanalo Creek, Waimanalo, and Mokapu Channel, Marine Corps Base, Oahu.

SCIENTIFIC ADVISORY BOARDS

Technical Advisory Committee for Management of Lagunitas Creek, Marin Municipal Water District

South Bay Salt Pond Restoration Project, Sediment Workshop Leader, County of Alameda

Science Review Group for Napa Watershed Project of the San Francisco Estuary Institute

Pescadero Creek Technical Advisory Committee, San Mateo Resource Conservation District

San Pablo/Wildcat Technical Design Advisory Council, City San Pablo

Hill Area Fuel Reduction Committee, University of California at Berkeley

Mayors Task Force of Forestry and Vegetation, City of Oakland

- Fluvial and Tidal Geomorphology Consultant for Marin County Flood Control District to conduct a watershed analysis of Novato Creek, Marin County, with special focus on sedimentation and sediment sources to the Novato Flood Control Project.
- Fluvial Geomorphology Researcher contracting with the Point Reyes National Seashore, to conduct research and monitoring of the second and third year hydrologic and geomorphic effects of the 1995 Vision Fire on Muddy hollow Creek, Marin County.
- Fluvial Geomorphology Researcher for the West Marin Environmental Action Committee to conduct research and monitoring of the first year effects of the 1995 Vision Fire in the Inverness Ridge, Marin County.
- Teacher with Dr. Luna B. Leopold and Dr. Scott McBain for the Teton Science School, Jackson, Wyoming at the Hydrology Workshop on fluvial hydrology, field methods and watershed analysis.
- Fluvial Geomorphology Consultant to U. S. Department of Justice for research on Reserved Water Rights Case on the effects of water diversion on the Fraser River, Lostman Creek, and Indian Creek, Colorado, plus expert testimony.
- Fluvial Geomorphology Consultant to EA Engineering, to perform watershed analyses for a 100-Year Sustained Yield Program for the Noyo River, Mendocino County. Analyses included documentation of channel conditions, determining impacts of logging upon hydrology and fluvial geomorphology of coho salmon habitat, sediment production and landsliding; and advising policy makers on ways to reduce future impacts from timber harvesting.
- Fluvial Geomorphology Consultant to U.S.F.S., to determine the Holocene and recent geomorphic history of the South Fork Kern River in Monache Meadows, Southern Sierra Nevada, Inyo National Forest. Analysis was conducted of flood frequency; channel incision and sediment transport regimes and related to climate change and land use practices for the last 200 years.
- Geomorphology Consultant to law firm of Lossing and Elston, San Francisco, to prepare expert testimony on the effects of fire upon slope stability, landsliding, runoff and erosion.

As a Staff Researcher in the Department of Geology and Geophysics, University of California at Berkeley, Ms. Collins was involved with the following:

- Fluvial geomorphology research for the Pacific Southwest Forest and Range Experiment Station, U.S.F.S. to produce detailed stream maps, longitudinal profiles, and cross

sections within and outside of cattle exclosures in the Golden Trout Wilderness, Inyo National Forest, California.

- Tidal marsh geomorphology and hydrology research in the Petaluma Marsh, Sonoma County.
- Fluvial hydrology research on braided channels in regions of Wyoming and Idaho.
-

Senior Research Associate for Lawrence Berkeley National Laboratory to conduct geologic field mapping, analysis and report preparation of site characteristics for the LBNL Hazardous Waste Handling Storage Facility in Strawberry Canyon, Berkeley, California.

Teacher for San Francisco State Sierra Nevada Field Station for undergraduate course in stream restoration, watershed analysis, and stream monitoring techniques.

District Geologist for East Bay Regional Park District, Oakland, Ca. Responsibilities included identification and analysis of geological hazards; direction of geologic and hydrologic research programs; publication of research findings; formulation of District policy pertaining to fuel break management, and resource management relative to hydrologic and geologic issues; preparation of expert testimony; preparation and review of Environmental Impact Reports; assessment and restoration of steelhead habitat in Wildcat Creek, Berkeley Hills.

Geologist/Hydrologist for the Center for Natural Resource Studies, John Muir Institute, Inc., Berkeley, to conduct field study and analysis of flood effects and instream flow requirements of San Lorenzo River, Santa Cruz, California; assessment of geologic hazards and evaluation of fish habitat Grider Creek, Klamath National Forest; assessment of cumulative impacts of silvicultural practices in the Sierra National Forest; assessment of the effects of silvicultural practices on site productivity in California forest lands; and publication of research findings.

Hydrologic Field Assistant, for Water Resources Division, US Geological Survey, Menlo Park, to conduct field study and analysis of 1) earthflows in Redwood National Park, California; 2) river morphology as effected by volcanic activity, Mt. St. Helens, Washington; 3) interactions among hillslope and stream processes in the San Lorenzo River, Santa Cruz, California; and 4) publication of findings.

Student Assistant for the California Department of Forestry, Sacramento, to conduct field study and analysis of the effects of logging activities and the effectiveness of the Forest Practice Regulations on rates of erosion in private forest lands throughout California.

Student Assistant for Geology Department, California Academy of Sciences, San Francisco assisting with the curation of fossil genera of ammonites and echinoids for Dr. Peter Rhoda.

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4. Coats, R., and L. M. Collins, J. Florsheim and D. Kaufman, 1985. Channel change, sediment transport, and fish habitat in a coastal stream: effects of an extreme event. Environmental Management. 9(1), pp. 35-48.
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16. Collins, L.M. and B. Ketcham, 1997. Rills and Hoodoos, Tree Falls, Debris Dams and Fans, in Burning Issues in Fire Management, special Fire Research Document, published by Point Reyes National Seashore, National Park Service, Department of Interior. 4 pp.
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26. Collins, Laurel, March 2007. Contaminant Plumes of the Lawrence Berkeley National Laboratory and their Interrelation to Faults, Landslides, and Streams in Strawberry Canyon, Berkeley, and Oakland, California prepared for The Committee to Minimize Toxic Waste, Berkeley California.
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28. Collins, Laurel, in progress 2007. Geomorphic Analysis of Land Use Impacts in Crow Creek, Alameda County, California prepared for The Alameda County Flood Control and Resource Conservation District.

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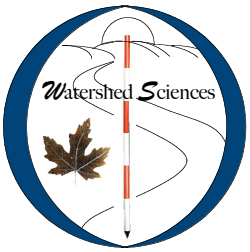

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TECHNICAL MEMO ON REVIEW OF SOUTH SHORE PROJECT
Laurel Collins, May 26, 2009

Dear Mr. Graf,

At your request, I have reviewed portions of the Lake Tahoe Basin Management Unit South Shore Fuel Reduction and Healthy Forest Restoration EIS/EIR (South Shore Project) proposed by the Lahontan Regional Water Quality Control Board ("Lahontan") and the U.S. Forest Service.

I have been a geomorphologist since 1981 specializing in fluvial, hillslope, and tidal wetland geomorphology, sediment budgeting, landslide and stream mapping, and analysis of geomorphic change from natural and anthropogenic influences. My experience on the issues raised by the Waiver and MOU is based on my work on various sediment source assessment and monitoring projects for the US Forest Service, California Department of Forestry, US National Park Service at Point Reyes National Seashore, San Francisco Bay Regional Water Quality Control Board, Alameda County, Marin County, Contra Costa Clean Water Program, and the East Bay Regional Park District. I am the Owner/Director of Watershed Sciences consulting firm, which I established in 2001. Attached to this review is a copy of my current CV. A few examples of my experience follow.

For the California Department of Forestry (CDF) I was involved in a 5-year monitoring project for the Board of Forestry to assess the effectiveness of forest practice rules that were developed specifically to reduce erosion and sediment supply to streams in areas that had various silvicultural practices, ranging from clearcutting to selective helicopter logging. At numerous 10-acre study sites located throughout private and public California forestlands, effectiveness monitoring of erosion control practices was conducted by measuring sediment trapped behind erosion control structures (such as water bars and dissipation structures), by measuring the size of voids created by erosion from landslides, gullies, rills, and from failed road crossings associated with logging roads and tractor trails. Data were collected yearly, statistically analyzed, and total sediment supply on logged sites was compared to that from study sites that served as controls, where no silvicultural practices had been previously conducted. Photo monitoring was an integral component of monitoring and used to document and verify conditions.

As a separate project later contracted by the CDF, I was a co-author of a report on a cautionary review of the effects of silvicultural activities on site quality. The report dealt particularly with the impact of logging on nutrient cycling and mass wasting.

For the Pacific Southwest Forest and Range Experiment Station, I established ten long-term monitoring sites of channel and erosion conditions in the in the Golden Trout Wilderness, Inyo National Forest, California. I produced detailed stream maps, with quantitative data on sediment size classes, longitudinal profiles, cross sections, and a methodology for monitoring and assessing and quantifying future change.

For The Point Reyes National Seashore I monitored post fire sediment production and runoff following the 1995 Vision Fire. This involved stream gaging, measurement of sediment deposition in a developing alluvial fan, assessment of hydrophobic soil conditions, and monitoring stream and landscape response for over three years. Similarly, following the 1991 Tunnel fire in the Oakland Hills, California, I monitored erosion and sediment production as influenced by wildfire, as well as by post fire erosion control activities.

For Alameda County, I developed a preliminary sediment budget for Alameda Creek and protocols for developing a sediment budget by sampling and monitoring sediment load at key gaging stations along the stream network. Recently for a TMDL (total maximum daily load) analysis for the San Francisco Regional Water Quality Control Board, I developed a methodology and performed an analysis of sediment supply from natural and land use-related stream and hillsides sources of the nearly 100 sq mi Sonoma Creek.

As part of this review, I have addressed a number of questions about the South Shore Project and how it may affect water quality and beneficial uses in the Basin. In particular, I have considered the South Shore Project's proposed monitoring scheme, which I do not find to be adequate considering the scope of this project and the extremely sensitive habitat in which the proposed fuel reduction activities will be occurring. Based on my prior declarations, I am generally familiar with Lahontan's 2007 Waiver, its newly adopted 2008 Waiver and MOU with the Tahoe Regional Planning Agency ("TRPA"), and with its newly adopted 2009 Regional Waiver regarding fuel reduction activities.

1. Potential for Fuel Reduction Activities to Have Significant Impacts on Water Quality and Beneficial Uses

In my experience working in the Sierra Nevada, I have observed that the logging activities on steep slopes and within stream zones have the potential to discharge substantial amounts of sediment. This is particularly true where heavy equipment is used, especially in areas with decomposed granitic bedrock and/or granitic soils that have abundant fine sediment, often referred to as grus. Following fire, but even before the first rainfall, natural sediment supply rates into streams can be quite high from dry ravelling of soil from the inner gorge of

stream canyons. Once rainfall occurs, especially in areas that have hydrophobic soils, pervasive rill networks from occur over vast portions of the hillsides, providing a supply of fine surface soils to the stream network. Without effectiveness and forensic monitoring, these natural geomorphic responses might be difficult to distinguish from man-related project causes in areas that are treated for post fire erosion control.

It is important to note that even the process of implementing erosion control practices or the structures or applications themselves can sometimes be more damaging than if nothing had been done. For example, following the Tunnel Fire in the Oakland Hills, hydro mulching reduced vegetation recovery from soil disturbance, hay bale check dams in small water courses increased sediment production and delivery to streams, hay bales placed on landslides increased the potential for landsliding by increasing the amount of soil saturation, and trampling by foot and mechanical disturbance of the soil during applications of erosion control caused the break down of the fine root network in the surface soils, leading to increased surface erosion by the development of rills and gullies (Collins and Johnston, 1995; Booker, Dietrich, and Collins, 1995). Trained experts are required to assess where erosion control remediation is necessary or could be potentially detrimental.

2. Importance of Monitoring Requirements in Lahontan's 2007 Waiver

As I have discussed in prior comments, the 2007 Waiver requires implementation, forensic and effectiveness monitoring for a higher risk fuel reduction activities. If a project meets a number of criteria, the Lahontan waiver only requires implementation monitoring. These criteria include no constructed watercourse crossings, no ground based equipment operations within stream zones or on slopes over 30%, no winter operations and no road or landing construction within 500 feet of stream zones.

Conversely, if a project contains any of these criteria, effectiveness and forensic monitoring is required. In this way, the existing Lahontan waiver recognizes the potential for projects with one or more of these criteria to discharge significant amounts of sediment into watercourses and the need for effectiveness and forensic monitoring to ensure that mitigation measures put in place to avoid these impacts are functioning effectively.

Forensic monitoring requires sites to be inspected and photographs shall be taken following storm events based on significant amounts of precipitation. The goal of winter forensic monitoring is to locate sources of sediment delivery (or potential delivery) in a timely manner so that rapid corrective action can be taken where feasible and appropriate. Winter forensic monitoring may also assist in determining cause and effect relationships between hillslope activities, hydrologic triggers and instream conditions.

The 2007 Waiver relies on forensic monitoring to correct ongoing problems with the effectiveness of mitigation measures installed to avoid adverse water quality impacts. The waiver states that follow-up forensic monitoring

inspections and photo-point monitoring shall be conducted weekly until corrective action is completed to repair or replace failed management measures and/or significant sediment discharges have ceased. Sites that are determined to be sediment sources during forensic monitoring shall be photographed prior to and following corrective action being implemented at the site.

The 2007 Waiver also requires effectiveness monitoring to be conducted as soon as possible following the winter period. Effectiveness monitoring "shall be designed to determine the effectiveness of management measures in controlling discharges of sediment and in protecting water quality" and to "help to determine whether Waiver criteria and conditions, on a programmatic scale, are adequately protecting water quality and instream beneficial uses."

The Effectiveness monitoring inspection shall include visual inspection and photo documentation of sites identified in the Inspection Plan. If the visual inspection reveals a significant management measure failure, a visual inspection of instream components (bank composition and apparent bank stability, water clarity and instream sediment deposition) shall also be conducted and the conditions shall be documented.

Effectiveness monitoring shall continue until the discharger submits a Final Certification compliance report to Lahontan demonstrating that the projected and any necessary mitigation measures were completed in compliance with the waiver and all requirements of the applicable water quality control plan. The waiver also requires semi-annual reporting. Dischargers shall submit an Implementation Monitoring Report on January 15 of each year, and an Effectiveness Monitoring Report on July 15 of each year.

As I have previously commented, the monitoring conditions contained in this waiver help to ensure that high risk projects do not lead to significant discharges of sediment and other pollutants. For monitoring to be effective, it must be timely and verifiable and must contain a mechanism that ensures that problems are corrected as soon as they are identified in the monitoring process. In my opinion, where these components are not present, there is the potential for substantial impacts on water quality because there may no longer be an effective mechanism to verify that mitigation designed to avoid pollutant discharge has been successful, or if not, has been immediately corrected.

In my opinion, forensic and effectiveness monitoring is necessary to ensure that mitigation measures designed to avoid substantial pollutant discharge have been implemented and are effective, or, if not effective, will be quickly corrected. Without rigorous protocols for quantitative effectiveness and forensic monitoring it might not be possible to establish cause and effect of site deterioration or the linkages between impacts caused by land management activities versus those that are natural. Without this kind of information remediation efforts can often be useless or lead to more costly problems.

At points in the DEIS/DEIR, the South Shore Project states that certain activities in sensitive areas such as stream zones have been found not to cause

significant discharge or lasting environmental impacts, based on review by Lahontan or other agency staff. To the extent that the DEIR/DEIR is suggesting that there is therefore no reason to monitor these types of activities, I would strongly disagree. As discussed above and below, fuel reduction activities in sensitive areas have the potential to discharge sediment based on site-specific conditions or how a particular activity is implemented on the ground. While a particular project on a particular site may have avoided pollutant discharge through the implementation of BMPs, that does not mean that all such activities at all similar sites will also avoid discharges to water bodies. In my experience, this is the main purpose of monitoring; to ensure that activities that have the potential, when properly implemented under normal conditions, to avoid discharges of sediment. In my experience, sediment and other pollutant discharge can occur from activities that are not expected to cause such discharge under normal conditions.

3. Critique of South Shore Project BMP Monitoring Based on Thresholds of Concern

The South Shore Project proposes to conduct project specific forensic and effectiveness monitoring in a limited number of watersheds based on a Cumulative Watershed Effects" (CWE) analysis which is triggered where there is: 1) an increase in risk ratio (RR) of 20% or more in watersheds not over the threshold of concern (TOC), 2) an increase in RR of 5% or more in watersheds that are over the TOC, and 3) equivalent roaded acres (ERA) increasing above the TOC due to project activities. According to this approach, the Project proposes forensic/effectiveness monitoring on three out of the 18 watersheds that will be affected by this Project. The remaining watersheds will be included as candidates in the Forest Service's random monitoring conducted according to its overall Best Management Practice Evaluation Program (BMPEP).

I find two problems with this approach in the Tahoe Basin.

First, the Forest Service's BMPEP provides extremely limited oversight for high risk Project activities conducted in the Basin, since the sampling is random and not focused on either this Project, or on particular high risk sites such as steep slopes or stream environment zones. In my opinion, the standard BMPEP will not provide adequate information for Lahontan or the Forest Service to know whether BMPs are all functioning correctly over time in the face of snowmelt and larger storm events. This is because numerous potential high risk sites will not be monitored under the BMP's random system.

Second, I do not find the Forest Service's approach for selecting watersheds for project specific effectiveness and forensic monitoring to be appropriate in light of the fact that all watersheds drain to Lake Tahoe.

The South Shore Project's criteria for more extensive monitoring are based on the increase and/or nearness of threshold that a particular watershed is to its Threshold of Concern (TOC). TOCs are based on the equivalent roaded area (ERA) calculation, which is used to estimate the impacts of various land use

activities in a watershed. The ERA calculation relates magnitude of land use disturbances for different management practices to an acre of road disturbance. Land uses are assigned a coefficient based on relative impact, ranging from 1.0 for roads, structures, and other impervious surfaces to 0.0 for land uses that have a negligible or positive impact on the soil hydrologic properties.

The TOC uses a calculation of the threshold value of equivalent impervious surface an area can tolerate before it is expected to have the potential for adverse impact. Impervious surface coverage (IC) must be calculated to determine TOC for each watershed. TOC does not represent the exact point at which cumulative watershed effects will occur. The South Shore Project notes that TOC serves as a "yellow flag" indicator of increasing susceptibility for adverse cumulative effects (page 3-101, DEIS/DEIR). The Project indicates that the hydrologic response cannot be assessed based upon the percent reduction in permeability and that it does not account for whether treatments are near a stream course, hence it cannot be established if sediment is delivered to a stream course. The Project also states that ERAs provide useful comparisons of effects among alternatives. Because of their limitations as stated above, in my opinion these calculations should not be the basis for determining whether monitoring is needed.

In my experience working in the Sierra Nevada, I have observed that the logging activities on steep slopes and within stream zones have the potential to discharge substantial amounts of sediment. Sediment sources are not dependent upon the creation of impermeable surfaces but may occur from site specific activities such as the collapsing of hills or banks, the turning of machinery, skidding loggings, reducing soil cohesion due to root loss, the extension of channel heads upslope into previously unchannelized swales (zero order basins) due to increased runoff, etc.

In many of these instances, the overall ratio of impermeable surface in a watershed will be practically irrelevant since the source of pollution is coming from a specific site of discharge. Just the loss of interception can change the amount of groundwater in the soils, timing at which saturation occurs, and can increase total runoff, thereby inducing downstream channel adjustments, such as bank or bed erosion, to accommodate more flow. Hence, more downstream off-site sediment production can be caused from a site without necessarily having a high impermeability rating. Landslides can also be mobilized in areas that are not necessarily steep or have a high impermeability rating due to changes in evapotranspiration. Additionally, road crossings can also be the source of landslides and sediment production when culvert inlets clog with woody debris or sediment and cause failure of the road fill.

These changes combined with loss in root strength that would be associated with logging or thinning operations can alter the soils resistance to sliding and to surface erosion. In areas that are or are not effected by fire that are undergoing fuel reduction activities and even on slopes less than 30 percent, mechanical disturbance of the soil surface can destroy the added soil cohesion that is provided by the fine roots of vegetation (Booker Dietrich and Collins, 1993)

(see CV for cited references). This added soil cohesion is particularly critical in steep areas that are often found in or near (within 500 feet of) stream environment zones. With just light mechanical disturbance and creation of bare soils, intense rainfall in some soils can create a series of rill networks similar to those found in hydrophobic soils following intense fires. These rill networks might later be covered by snow, litter, or destroyed as vegetation recovers. Without effectiveness and forensic monitoring, these land use-related sediment sources might go undetected yet create significant negative impacts.

Effectiveness and forensic monitoring is particularly needed to determine the influences of large events such as rain on snow events that have been shown to produce some of the largest flood impacts in the Sierra. In these extreme conditions, it will be important to establish if BMPs and other erosion control remedies are able to perform. A system should be in place to modify or fix erosion control applications that are not functioning properly or that might be creating larger problems. I have often observed that under moderate rainfall conditions, erosion control applications might only function well for the first few storms of the season, but need maintenance or modification to continue to perform throughout the remainder of the season. Adaptive maintenance is essential to minimize negative impacts and in order to do this, effectiveness monitoring is key. In my opinion, the absence of such monitoring could lead to substantial amounts of sediment discharge in flooding events because the problems would not be identified in a timely manner.

After logging, thinning, salvage operations, or other fuel modification activities that cut trees there is a subsequent loss in soil strength to resist surface erosion and landsliding. This is caused by the decay and loss of small and large roots. For example, studies have shown that large roots of conifers, such as Douglas fir, decay in about 5-7 years (Coats and Collins, 1981). This is before roots of germinated seedlings can contribute significant added cohesion. At this point, forest soils dominated by conifers can be at their weakest to resist mass wasting from landslides. Continued monitoring beyond a five-year time frame is needed to capture the potential effects of these land use practices, otherwise significant negative impacts caused by land management might go undetected. These kinds of impacts that provide fine sediment to any portion of the stream network, even along small headwater ephemeral channels can influence any particular designated “class” or size of downstream channel. This means that distance limits of 500 ft on the proximity of a Class I, II, or IV watercourses might not be effective. The source area for many debris slide type landslides is colluvial hollows or zero order basins. These slides can be initiated by increases in soil saturation and decreases in added soil cohesion as influenced by silvicultural practices. Zero order basins are often well above the channel head or areas that would be identified as stream protection zones, yet landslides emanating from these source areas can quickly evolve into debris torrents, bulking up with sediment already within the channel, and travel long distances downstream along a runout pathway until the stream gradient flattens enough to induce deposition. Debris torrents are extremely destructive and channel recovery from negative impacts can take years.

For this reason, in my opinion it is essential that forensic and effectiveness monitoring should not be based upon a TOC calculation but instead on whether the particular proposed activity has the potential for discharge to water bodies in the Basin. This is particularly true given that it appears all the affected watersheds in the South Shore Project run into Lake Tahoe, which is currently suffering water quality problems caused by the sediment and nutrients discharged from these activities.

4. Discussion of Potential Impacts of Using Mechanical Based Equipment in Stream Zones

The South Shore Project proposes using mechanical equipment on approximately 645 acres of stream zone. (See DEIS/DEIR, p. 2-37, Table 2). In my opinion, this activity has the potential for significant discharges of sediment and for degradation of the riparian environment.

It is common knowledge and well documented in the literature that ground-based equipment in sensitive stream zone areas has the potential to cause erosion and sediment discharge. This is why protected stream zones were created. The Project proposes two techniques here, whole tree yarding and accompanying skidding of larger logs, and cut to length operations. Here, each of these activities has the potential for water quality impacts. For example, large vehicles may dislodge substantial amounts of soil and mechanically disturb cast areas of the subsurface soil structure, particularly near the banks of streams. When a vehicle such as a loader or forwarder pivots in the soil, it can create sources of sediment production. The skidding of logs – typically part of the whole tree logging operation – also has the potential to expose bare soil and create pathways for surface runoff to concentrate and erode the soil. When this happens within a stream zone, sediment is likely to be discharged into the stream during the next storm or runoff event. Limits on tire pressure that minimize soil compaction do not necessarily mean that there will not be sediment production and supply to the stream. Disturbed bare soils do not require compaction to generate sediment as indicated by studies from Booker *et al* (1993).

The South Shore Projects discusses using “lighter” ground based equipment in stream zones as a means to avoid environmental impacts. In the past, Lahontan has defended the use of mechanical equipment in stream zones up to 10 pounds per square inch (psi) on granitic soils and 13 psi on non-granitic soils. In my opinion, even the use of lighter vehicles has the potential for significant impacts, for the reasons stated above.

The focus on psi is similar to the approach taken by the South Shore Project on monitoring, which focuses the concern on the relative impermeability of the soil. As discussed above, however, soil impermeability is only one factor to consider in whether fuel reduction activities has the potential to discharge sediment to streams. In my opinion, the most important focus is what the equipment is actually doing in the stream zone that could cause impacts. Too much emphasis is placed on potential changes in permeability rather than

assessing all processes that could deliver sediment to the stream and route it to Lake Tahoe.

I also do not agree that use of mechanical equipment on granitic soils necessarily makes impacts less than significant. In my experience, certain types of granitic soils are highly susceptible to erosion due to ground based equipment use, especially in areas with decomposed granitic bedrock and/or granitic soils that have abundant fine sediment, which are often referred to as grus. Following fire, but even before the first rainfall, natural sediment supply rates into streams can be quite high from dry ravelling of soil from the inner gorge of stream canyons. After rainfall, especially in areas that have hydrophobic soils, pervasive rill networks can occur over vast portions of the hillsides and can directly supply fine surface sediment to the stream network. Without effectiveness and forensic monitoring, these natural geomorphic responses might be difficult to distinguish from man-related project causes in areas that are treated for post fire erosion control.

5. Monitoring for this Project Should Include Instream Data Collection To Ensure that Significant Impacts Are Being Avoided Over Time

The monitoring plan for the South Shore Project does not include instream monitoring, even at select locations. (See DEIS/DEIR, pp. 4-1 - 4-6.) In my opinion the lack of instream monitoring means that there is no way to keep track of whether project activities are avoiding substantial impacts to stream quality and sensitive habitats.

Instream monitoring is necessary to address whether BMPs and other operating procedures are successful in avoiding significant impacts to water quality and stream environments over time. At the least, photographs should be taken of bed and bank conditions. This should be coupled with quantitative measurements of average bank retreat, average bank height (for bankfull stage), average pool depth, and bed particle size (d50) for combined individual segments of pools, riffles, and glides over the length of the site and at least 20 bankfull widths of length upstream and downstream of the site. Protocols for these kinds of measurements can be found in Applied River Morphology (D. Rosgen, 1996) and/or Watershed Assessment of River Stability and Sediment Supply (D. Rosgen, 2006). The latter is a recently funded EPA project to provide tools for assessing stream conditions. Ideally, the streams within the site should also be classified by Rosgen stream type to establish if stream condition is changing.

6. Lack of Monitoring Triggers for Adaptive Management

The South Shore Project also lacks an effective trigger mechanism through which monitoring results through instream monitoring and BMP forensic and effectiveness monitoring can lead to necessary changes on the ground to avoid further impacts to water quality and the stream environment.

By adopting quantitative measurements such as those discussed above, triggers could be identified that would result in further investigation or corrective actions. For example, if the measurements showed that the sediment particle size class for all habitats was changing to finer within or immediately downstream of the project site and not upstream, this would trigger an analysis of what is happening at the site to create negative impacts. Changes in stream class to ones that are indicative of instability, or changes in bank height that indicate pervasive incision or aggradation could also be triggers.

The 2007 Lahontan Waiver has specific triggers to ensure that when BMPs have not been adequately implemented or are not operating effectively over time, the problems that are identified must be corrected, and that more intensive monitoring shall occur until that has been accomplished. In my opinion, these requirements represent a minimum level of monitoring that would be necessary to meet this objective.

Where only implementation monitoring is required, and not project specific forensic and effectiveness monitoring, this would not ensure that adverse impacts would be avoided because mitigation measures put in place after logging projects are completed often fail or are not effective in avoiding sediment discharge.

Finally, without verifiable compliance using such techniques as pre and post project monitoring points, it is not possible for a regulatory agency to ensure that adverse impacts to water quality are being avoided. Ideally, reproducible quantitative measurements of erosion sites should be made to establish the amount and size of the sediment supplied to the stream system and should be accompanied by qualitative information that assigns sediment supply to different source types and establishes cause and effect. Without this there cannot be sufficient adaptive management.

Sincerely,

Laurel Collins

Laurel M. Collins

Owner/ Director Watershed Sciences

AREAS OF EXPERTISE

- Fluvial Geomorphology
- Tidal Wetland Geomorphology
- Sediment Budgeting
- Landslide Mapping
- Landscape Aerial Photo Interpretation
- Geomorphic Effects of Wildfire and Land Use Impacts
- Stream Restoration Design

EDUCATION

University of California, Berkeley B.A., Earth Sciences, 1981

PROFESSIONAL HISTORY

Watershed Sciences, Owner/Director 2001-to date

San Francisco Estuary Institute, Environmental Scientist, 1999-2001

Independent Consultant, Environmental Sciences, 1989-2001

University of California, Staff Researcher, 1984-2001

Lawrence Berkeley Laboratory, Senior Research Associate,

REPRESENTATIVE EXPERIENCE

Ms. Collins has been a geomorphologist since 1981 specializing in fluvial and tidal wetland geomorphology, sediment budgeting, landslide analysis, stream monitoring and mapping, and analysis of geomorphic change from natural and anthropogenic influences, Ms. Collins has conducted sediment budget and source analysis in Sonoma Watershed for the Regional Water Quality Control Board and has served as an Expert Witness for testimony pertaining to Geomorphology.

As Owner/Director of Watershed Sciences consulting firm established 2001, the following projects is a representative sampling of some of the projects that Ms. Collins has been directly involved in:

- Sediment source analysis and landslide mapping for development of a TMDL in Sonoma Creek watershed for the Sonoma Ecology Center and the San Francisco Regional Water Quality Control Board.
- Lidar and GIS analysis of logging road along the Eel River, Ca, for University of Minnesota and University of California.
- Expert Witness for San Francisco law firm of Murphy, Parson, Bradley, and Feeney on a case assessing causation of a landslide in Moraga.
- Development of action plan and methodologies for conducting a sediment budget analysis on Alameda Creek for Alameda County.
- Expert Witness for analysis of landslide causation within a development in Moraga, CA, for Murphy, Pearson, Bradley & Feeney, San Francisco, CA.
- Geomorphic analysis and landslide mapping of Crow Creek to assess impacts of land use practices and natural processes for Alameda County.
- Expert Witness for Determination of Natural versus Artificial conditions of the Mitchell Slough of the Bitterroot River, Montana, for Doney, Crowley, Bloomquist, Payne, Uda PC, Missoula Montana.
- Sediment source evaluation and conceptual plans for reducing sedimentation in Eden Creek for Alameda County.
- A sediment source analysis and sediment budget in Sonoma Watershed for Regional Water Quality Control Board and subcontractor for Sonoma Ecology Center.
- Assessment of flooding and geomorphic change in the lower Sonoma Creek Watershed for the Coastal Conservancy and Southern Sonoma Resource Conservation District.

1992-1993

East Bay Regional Park District, Resource Analyst 1983-1986, Geologist, 1986-1991

Center for Natural Resource Studies, John Muir Institute, Environmental Scientist, 1980-1983

U.S. Geological Survey, Hydrologic Field Assistant, 1980-1982

California Department of Forestry, Field Assistant, 1979-1980

California Academy of Sciences, Paleontology Department Student Assistant, 1978.

AFFILIATIONS

American Geophysical Union, 1986-to date

Geological Society of America, 1983-2001

California Forrest Soils Council, 1980-1991

TEACHING

Watershed Analysis, Sierra Nevada Field Station, San Francisco State, 1998-2003
Hydrology Summer Field Course, Teton Science School, 1991 and 1996

- Geomorphic assessment of long-term processes associated with reservoir stability and the maintenance of red–legged frog breeding habitat of Point Reyes National Seashore, U.S.N.P.S.
- Geologic, geomorphic, and landslide mapping of Strawberry Canyon in Berkeley, California, for the Committee to Minimize Toxic Waste and Urban Creeks Council.
- Preliminary assessment of opportunities and constraints for restoration and fish barrier removal in lower Ignacio Creek (Arroyo San Jose), Marin County for Friends of Ignacio Creek and City of Novato.
- Development of conceptual plans for restoration and geomorphic analysis of lower Wildcat Creek for City of San Pablo and Urban Creeks Council.
- Survey of longitudinal profile of lower Carriger Creek, Sonoma County, for the Southern Sonoma Resource Conservation District.
- Geomorphic analysis and landslide mapping of silvicultural impacts on sediment supply of Sulphur Creek, Plumas County, for the U.S.F.S. and Plumas Corp.
- Geomorphic analysis of lower Carriger Creek for the Klamath River Information System, William Kier Associates.
- Stratigraphic analysis, carbon dating, and history of geomorphic change at Last Chance Creek near Stone Dairy, Plumas County for the Plumas Corporation.

As Geomorphologist for the San Francisco Estuary Institute, Ms. Collins:

- Developed of a "Watershed Science Approach" for field methodologies to assess and analyze changes in the delivery of water and sediment as affected by Euro-American land use practices in California.
- Conducted a scientific study of physical processes and land use impacts in Wildcat Creek, Contra Costa County, for the San Francisco Estuary Institute. Developed a field-based methodology for quantifying natural versus man-related sediment supplies.
- Applied the Watershed Science Approach to San Antonio Creek, Marin County, for the Southern Sonoma Resource Conservation District.
- Applied the Watershed Science Approach to Carriger Creek, Sonoma County for the Southern Sonoma Resource Conservation District.

As an Independent Consultant, Ms. Collins was served as the following:

- Consulting Geomorphologist for the Napa Resource

SCIENTIFIC ADVISORY BOARDS

Technical Advisory Committee for Management of Lagunitas Creek, Marin Municipal Water District

South Bay Salt Pond Restoration Project, Sediment Workshop Leader, County of Alameda

Science Review Group for Napa Watershed Project of the San Francisco Estuary Institute

Pescadero Creek Technical Advisory Committee, San Mateo Resource Conservation District

San Pablo/Wildcat Technical Design Advisory Council, City San Pablo

Hill Area Fuel Reduction Committee, University of California at Berkeley

Mayors Task Force of Forestry and Vegetation, City of Oakland

Conservation District to establish and help educate different stewardship groups and to develop protocols to collect data on stream geometry to monitor channel change.

- Consulting Fluvial Geomorphologist Geomorphology Consultant for AECOS and Institute for Sustainable Development to conduct a watershed analysis for Waimanalo Creek, Waimanalo, and Mokapu Channel, Marine Corps Base, Oahu.
- Fluvial and Tidal Geomorphology Consultant for Marin County Flood Control District to conduct a watershed analysis of Novato Creek, Marin County, with special focus on sedimentation and sediment sources to the Novato Flood Control Project.
- Fluvial Geomorphology Researcher contracting with the Point Reyes National Seashore, to conduct research and monitoring of the second and third year hydrologic and geomorphic effects of the 1995 Vision Fire on Muddy hollow Creek, Marin County.
- Fluvial Geomorphology Researcher for the West Marin Environmental Action Committee to conduct research and monitoring of the first year effects of the 1995 Vision Fire in the Inverness Ridge, Marin County.
- Teacher with Dr. Luna B. Leopold and Dr. Scott McBain for the Teton Science School, Jackson, Wyoming at the Hydrology Workshop on fluvial hydrology, field methods and watershed analysis.
- Fluvial Geomorphology Consultant to U. S. Department of Justice for research on Reserved Water Rights Case on the effects of water diversion on the Fraser River, Lostman Creek, and Indian Creek, Colorado, plus expert testimony.
- Fluvial Geomorphology Consultant to EA Engineering, to perform watershed analyses for a 100-Year Sustained Yield Program for the Noyo River, Mendocino County. Analyses included documentation of channel conditions, determining impacts of logging upon hydrology and fluvial geomorphology of coho salmon habitat, sediment production and landsliding; and advising policy makers on ways to reduce future impacts from timber harvesting.
- Fluvial Geomorphology Consultant to U.S.F.S., to determine the Holocene and recent geomorphic history of the South Fork Kern River in Monache Meadows, Southern Sierra Nevada, Inyo National Forest. Analysis was conducted of flood frequency; channel incision and sediment transport regimes and related to climate change and land use practices for the last 200 years.
- Geomorphology Consultant to law firm of Lossing and Elston, San Francisco, to prepare expert testimony on the

effects of fire upon slope stability, landsliding, runoff and erosion.

As a Staff Researcher in the Department of Geology and Geophysics, University of California at Berkeley, Ms. Collins was involved with the following:

- Fluvial geomorphology research for the Pacific Southwest Forest and Range Experiment Station, U.S.F.S. to produce detailed stream maps, longitudinal profiles, and cross sections within and outside of cattle exclosures in the Golden Trout Wilderness, Inyo National Forest, California.
- Tidal marsh geomorphology and hydrology research in the Petaluma Marsh, Sonoma County.
- Fluvial hydrology research on braided channels in regions of Wyoming and Idaho.
-

Senior Research Associate for Lawrence Berkeley National Laboratory to conduct geologic field mapping, analysis and report preparation of site characteristics for the LBNL Hazardous Waste Handling Storage Facility in Strawberry Canyon, Berkeley, California.

Teacher for San Francisco State Sierra Nevada Field Station for undergraduate course in stream restoration, watershed analysis, and stream monitoring techniques.

District Geologist for East Bay Regional Park District, Oakland, Ca. Responsibilities included identification and analysis of geological and landslide hazards; direction of geologic and hydrologic research programs; publication of research findings; formulation of District policy for fuel break management, and resource management relative to hydrologic and geologic issues; preparation of expert testimony; preparation and review of Environmental Impact Reports; assessment and restoration of steelhead habitat in Wildcat Creek, Berkeley Hills.

Geologist/Hydrologist for the Center for Natural Resource Studies, John Muir Institute, Inc., Berkeley, to conduct field study and analysis of flood effects and instream flow requirements of San Lorenzo River, Santa Cruz, California; assessment of geologic hazards and evaluation of fish habitat Grider Creek, Klamath National Forest; assessment of cumulative impacts of silvicultural practices in the Sierra National Forest; assessment of the effects of silvicultural practices on site productivity in California forest lands; and publication of research findings.

Hydrologic Field Assistant, for Water Resources Division, US Geological Survey, Menlo Park, to conduct field study and analysis of 1) earthflows in Redwood National Park, California; 2) river morphology as effected by volcanic activity, Mt. St. Helens, Washington; 3) interactions among hillslope and stream processes in the San Lorenzo River, Santa Cruz, California; and 4) publication of findings.

Student Assistant for the California Department of Forestry, Sacramento, to conduct field study and analysis of the effects of logging activities and the effectiveness of the Forest Practice Regulations on rates of erosion in private forest lands throughout California.

Student Assistant for Geology Department, California Academy of Sciences, San Francisco assisting with the curation of fossil genera of ammonites and echinoids for Dr. Peter Rhoda.

PUBLICATIONS AND REPORTS

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I, John Buckley, hereby declare as follows:

1. I submit this declaration in support of the collective comments submitted by the Central Sierra Environmental Resource Center and other conservation organizations in response to the public comment period for the draft mitigated negative declaration and statewide State Water Board conditional waiver of waste discharge requirements for nonpoint source discharges related to certain activities on National Forest system lands within California. I have personal knowledge of the matters stated herein and, if called as a witness, could and would competently testify thereto.

2. I have been both the executive director and a member of the Central Sierra Environmental Resource Center (known locally as "CSERC" and also referred to as "the Center") since 1990 when I helped to found the organization.

3. CSERC is a non-profit 501(c)(3) organization with more than 600 members. Most of those members reside in Central California, primarily in Tuolumne County and Calaveras County. CSERC was formed in 1990 with a mission to identify threats to the environment in the central region of the Sierra Nevada; to research workable, balanced solutions to those environmental problems; to raise public awareness about those threats; and to advocate on behalf of the solutions. Over the years, the mission description and the focus of CSERC's work have evolved. In recent years, the formal, simplified mission statement for CSERC was refined and shortened to: "Working to defend water, wildlife, and wild places of the Northern Yosemite region."

4. CSERC has had a long-standing interest in the management of all of the national forests in the Sierra Nevada region, but the priority focus of the Center has been the Stanislaus National Forest (also referred to as the "Stanislaus Forest").

5. CSERC members actively use the Stanislaus Forest for recreational, educational, scientific, spiritual, and aesthetic purposes. Many CSERC members are water customers of utility districts that obtain their water from flows coming off Stanislaus National Forest watersheds. The vast majority or all of CSERC members participate in outdoor recreation in the Stanislaus Forest.

6. Each year many CSERC members communicate to CSERC staff with phone calls, e-mails, and personal communications about their fishing experiences, whitewater rafting trips, snowshoe trips, ski trips, hikes, wildlife observations, kayaking adventures, and many other outdoor

experiences in the Stanislaus Forest that tie to water resources. Some CSERC members camp or backpack in the Stanislaus National Forest for extended periods during which they consume water from forest streams. Many CSERC members also have communicated on their donation forms or with notes accompanying their donations various messages describing their strong interests in protecting the ecological health, the diversity of wildlife species, and water quality within the Stanislaus Forest. As a reflection of those resource protection interests, each year many CSERC members volunteer time to participate in hands-on workday projects in the Stanislaus Forest, where meadow restoration, stream bank rehabilitation, trash cleanups, and other volunteer projects are completed under the leadership of CSERC staff and cooperating U.S. Forest Service personnel.

7. Since its inception in 1990, CSERC has availed itself of nearly every opportunity to participate in the Forest Service's management and planning processes tied to the Stanislaus Forest, especially concerning motorized recreation and ecological impacts from roads and off-highway vehicle ("OHV") routes, but also concerning proposals for timber sales and the Forest Service's adoption, in 1991, of an overarching land management plan. In advocating for stronger natural resource protection in the Stanislaus over the past 21 years, CSERC has worked to exhaust all possible administrative remedies by fully engaging in every management planning process, project proposal, policy discussion, field trip opportunity, or other opportunity to communicate with U.S. Forest Service officials about OHV problems on the Stanislaus Forest over the past 21 years.

8. For many years as a teenager and a college student I personally visited and explored the Stanislaus Forest and adjacent Yosemite National Park to recreate extensively and to observe wildlife. In particular, I fished, hiked, backpacked, camped, skied, and watched wildlife. Between 1977 and 1986, I worked as a firefighter for the Forest Service, both stationed in the Stanislaus Forest and, for a six-year period, traveling across the country fighting major wildfires for the "Hot Shot" crew. From 1986 through January 1990, I worked in multiple jobs for the Stanislaus Forest during each summer/fall fire season. During my years with the Forest Service I traveled extensively with the Hot Shot crew to engage in fire suppression actions on national forests throughout California. I visited every national forest within California and personally observed the visual evidence of timber management, livestock grazing, road management, and other agency actions on

National Forest lands. In 1989, my last full year employed with the Stanislaus National Forest, I was selected as Employee of the Year on the MiWok District and was commended for providing extra dedication and excellent work above and beyond the expected level.

9. During the last three field seasons as a fire patrol technician with frequent interaction with the public, I had constant interaction with OHV riders on the Stanislaus Forest along with periodic discussions with affected property owners and with Forest Service law enforcement personnel. These experiences led to my strong concern that OHVs cause considerable harm to forest resources, primarily because they were allowed to illegally create more than 200 miles of user-created trails that combine to cause significant amounts of sediment problems for streams. Many of different uses of the Stanislaus Forest have been, and continue to be, degraded and diminished by OHVs and by additional impacts to water quality and natural resources from the widespread impacts of livestock grazing allowed within National Forest lands. In the sections below, I present my direct first hand experience with OHV regulation and impacts, and grazing impacts, on the Stanislaus National Forest. Based on my experience and in talking with other experts who follow this issue, my experience on the Stanislaus is typical for how National Forests in California fail to effectively regulate these activities, to the detriment of water quality.

OHVS AND THE FOREST SERVICE'S TRAVEL MANAGEMENT PLANNING PROCESS

10. Despite public comments and requests for resource protection, the Forest Service adopted a land and resource management plan for the Stanislaus in 1991 that did not limit use of OHV's on more than one hundred miles of user-created routes that had already been created at that point in the Stanislaus National Forest, and did nothing to prevent even more user-created routes from being created by OHV riders throughout the forest.

11. In 1998, the Forest Service approved a Motor Vehicle Travel Management Forest Plan Amendment, which took the first, however weak, step towards improving OHV management on the Stanislaus Forest. While the final plan took the important step of prohibiting motorized travel off of designated roads and trails, the Forest Service did not take steps to actually implement the prohibition by adopting necessary Forest Orders. In the years since, members of CSERC staff

advocated to Forest Service officials to take necessary steps to implement the prohibition on off-route motorized travel. These concerns were largely ignored.

12. Beginning in 2001, on behalf of CSERC I participated as one of the founding members of what was eventually designated as the Stanislaus Recreational Stakeholders (SRS) committee. In monthly meetings hosted and arranged by the Forest Service, SRS met to discuss potential regulatory changes and management changes that could reduce recreational conflicts between OHV's and quiet recreational users.

13. At the SRS meeting on August 11, 2004, Forest Supervisor Tom Quinn and Sue Warren (Program Team Leader for the Stanislaus Forest Route Designation/Travel Management process) outlined a new "designated route/OHV trails process" that was to be implemented on the Stanislaus National Forest. Sue Warren explained at that SRS meeting that the intent of the process was to identify every existing unauthorized OHV route, to map all of those routes, and then to determine which routes should be added to the legal system.

14. Many months later, in August and September 2005, the Stanislaus National Forest invited the interested public to three meetings held in Sonora, in Greeley Hill, and on the Calaveras District to launch an OHV Route Designation Plan process. On behalf of CSERC I attended all three meetings and provided detailed input on the proposed actions described by the interdisciplinary team. In particular, on behalf of CSERC I objected strongly to allowing 150 miles or more of user-created OHV routes to continue to be used for years while the planning process dragged on. In response Forest Supervisor Quinn and Sue Warren assured me and other concerned members of the public that the OHV Route Designation process would be fully completed in 3 years with a firm 2008 end date. (Instead, the actual decision was delayed until December 2009.)

15. Immediately after the initiation of the planning process and the early public meetings, CSERC staff biologists and other CSERC staff began compiling photo evidence of OHV route ruts, damaged stream crossings, routes running through sensitive plant locations, and other photographic evidence of route problems. Individual photos and explanations of individual routes were handed to Sue Warren and to individual district rangers. However, due to the lack of positive responses by Forest officials to these individual photos and written descriptions of problems,

CSERC began producing additional highly technical field-based data to bolster reasons why many user-created routes should not be legalized. Accordingly, CSERC hired an additional staff person during the 2006 summer field season to accompany Mike Milne, CSERC staff biologist, in field assessments of OHV routes. CSERC staff actually walked and photographed resource damage along a large number of OHV routes that we believed posed environmental risks or that were located in the midst of sensitive wildlife areas. Based on months of fieldwork and careful documentation with GIS coordinates, CSERC prepared a detailed photo report identifying reasons why specific user-created OHV routes were ecologically harmful. The CSERC 2006 OHV Field Survey Photo Report was first hand-delivered to Sue Warren on November 8, 2006 at a personal meeting I scheduled with her at the Supervisor's Office in Sonora. A second copy of that same CSERC OHV Photo Report was handed to the Regional staff at a meeting in Vallejo with the Regional Forester and Regional OHV staff on January 9, 2008.

16. During 2008, CSERC staff poured hundreds of hours of staff time into doing site specific field visits to user-created OHV routes, as well as photography, document reviews, and personal meetings with Stanislaus National Forest biologists, botanists, and line officers. Throughout 2008 and on into 2009, I (and at times others members of CSERC staff) met directly on multiple occasions with Sue Warren, District Rangers, and team members of the Travel Management interdisciplinary team. In March 2009 I attended yet another series of Motorized Travel Management Plan meetings in White Pines, in Sonora, in Greeley Hill, and in Modesto.

17. At a public meeting held in Modesto in 2009, our staff scientist and I referred the Forest Service to the numerous specific routes where we had photographed environmental damage and had then submitted photo documents as evidence to the Stanislaus Forest. To my knowledge none of these routes have been closed, relocated or fixed.

OHVs AND FOREST SERVICE'S INABILITY TO PROTECT WATER QUALITY

18. As both a member and a staff person with CSERC, I have experienced impacts caused by OHV use that directly harmed water quality. In the Deer Creek area, downstream below the bridge on Deer Creek, I have observed muddy water caused directly by ATV's and motorcycles cutting across the creek from campsites south of the creek to access OHV routes north of the creek.

When I fish in the Clavey River, Bourland Creek, and Trout Creek or other streams and rivers within the Stanislaus National Forest, I at times see OHV riders directly cutting back and forth across the creeks during the late summer season, churning up stream sediment or tearing up stream banks and diminishing my fishing opportunity. At Lyons Reservoir, at the headwaters where the South Fork Stanislaus River flows into the Reservoir, I have frequently observed OHV riders who think it is fun to roar their OHVs across the shallow section of the river, churning up mud and ruining the fishing and water quality. On one occasion a man with a modified old Jeep with large tires intentionally stopped in the middle of the narrow, shallowest section of the river and repeatedly gunned his engine to spin his wheels, sending water and mud in big plumes that turned the incoming river brown.

19. There have also been numerous instances when I have observed sediment discharges created by water flowing in ruts carved by OHV's. In the spring of 2010 I personally handed Regional staff members photos of a stream behind the Cedar Ridge subdivision on the Stanislaus National Forest. The stream was inundated by 16" or more of red-orange sediment that had obviously flowed off a short segment of an old Stanislaus Forest road and a newly authorized segment of an OHV route that runs straight up a steep hillside. The erosion caused by continued OHV use on that route directly contributed to a seasonal forest stream being choked by sediment in direct violation of the Clean Water Act and various State Water Board mandates. Prior to this time I had met with the Stanislaus National Forest Supervisor and the designated Forest team leader for the OHV Route Designation process that was then underway. In the Cedar Ridge forest area that was signed as closed to OHV use, multiple OHV's were riding on user created trails on an early weekday morning in direct conflict with the legal closure that was highly visible to those entering the forest. The Stanislaus Forest Supervisor shrugged his shoulders and bluntly admitted that the Forest "wasn't going to shoot" OHV riders who blatantly ignored posted signs. Both Forest Service officials admitted that they had limited ability to manage illegal OHV use and that enforcement of motorized closures was nearly impossible due to limited funding and staff.

20. The Stanislaus National Forest Motorized Travel Final Environmental Impact Statement ("FEIS") and Record of Decision ("ROD") for the Motorized Travel Management plan (17305) authorized OHV use on 136.77 miles of additional routes to be added to the legal system –

even though the Stanislaus Forest motorized road and OHV route system was already acknowledged to be at least $97,000,000 short of needed road maintenance as spelled out in the Motorized Travel DEIS. Those newly authorized 137 miles of routes were never designed for sustainable use and were simply created by OHV riders without any consideration for water quality impacts or sediment discharge potential.

21. The Stanislaus ROD approved OHV use on a spider's web of user-created OHV trails that crisscross the Deer Creek basin, including routes 16EV248, 16EV249, 16EV251, 16EV258, 16EV259, 16EV259A, 16EV253, 16EV254, 16EV266, 16EV266A. As I know from past experience, the use of these routes by OHVs results in discharges of sediment into streams and aquatic areas while leaving behind ruts and disturbed soil. In 2007 on behalf of CSERC staff, I met directly with various District Rangers as well as with Forest Supervisor Tom Quinn to point out resource harm that was being caused by OHV use on user-created routes, especially in the Deer Creek basin and Rose Creek. CSERC botanist Dr. Tom Hofstra and I met directly at the MiWok Ranger Station with District Ranger Ann Denton and Resource Officer Beth Martinez. We showed photos of problems in the Deer Creek area and explained in detail where even in steep hill-climb areas where the District had placed "no OHV" signs, OHV riders continued to ignore the signs and drive up and down the ruts. At that meeting Dr. Hofstra and I strongly advocated for the MiWok District to close broad areas to all OHV use (especially on unauthorized user-created trails) if violations occurred consistently. At those sessions, District Ranger Denton and resource officer Martinez both acknowledged openly that the Forest Service has limited ability to halt illegal OHV use or to even stop and cite fast-moving dirt bike riders who choose not to comply with posted signs that show routes to be closed to motorized use.

22. Another resource conflict example is the Clavey River-Trout Creek area. The Stanislaus ROD approves motorcycle use on several trails in this area and four-wheel drive (4WD) access down to the river on 18EV95. As a result, motorcycles use these routes to whine back and forth along the hillside above the stream and to drive down to the stream and river. My experience based on many observations is that motorcycle use of these trails causes disturbance of soils and the stream. The Stanislaus ROD approved continued use of route 5N02R by motor vehicles, a route

that intrudes into an otherwise completely wild portion of the North Fork Stanislaus River in a river segment proposed for wild and scenic river designation, on the Calaveras Ranger District. I have personally observed Jeep drivers gouging through riparian vegetation and churning up tributary streams that discharge directly into the North Fork Stanislaus River shortly downstream.

23. During the past eight years CSERC has periodically submitted to both the Stanislaus National Forest and the Regional Office highly detailed photo reports showing major ruts and erosion created on OHV routes by dirt bikes in particular. CSERC photo comments during Travel Management comment periods have shown OHV route crossings where OHV use has caused sedimentation into receiving waters. During the Stakeholders Committee sessions held in 2010, CSERC provided the State Water Board with additional photo comments showing resource damage and water quality impacts from OHV routes as well as dirt roads that are utilized by OHVs. To my knowledge, the Forest Service has not closed or repaired any of these routes.

24. Based on my long experience in working with the Stanislaus National Forest and my background on this issue, it is my opinion that with limited Forest Service budgets and limited staff, the Forest Service is incapable of enforcing existing regulations by OHV users within each national forest. Instead, the simple reality is that there is very little funding to implement these measures, as exhibited by the lack of enforcement of OHV violations

25. In my view, one of the problems with the Forest Service's proposed BMPs for OHVs is their failure to provide a coherent explanation for how *existing OHV routes* will be regulated so as to avoid significant water quality impacts. From my experience working on this issue, it is clear the vast majority of existing OHV routes were never planned by the agency and no NEPA analysis was ever done prior to the routes being created. It is not new, carefully designed and NEPA-analyzed routes that pose significant risk to water quality on NFS lands. It is the vast system of user-created OHV routes on each national forest that never were designed or even authorized by the agency until long after they were established. Instead, to create such an unauthorized user-created route, dirt bike motorcycle riders and ATV riders or drivers of 4WD vehicles drove across a mountainside or up a steep slope to the top, creating a route that they or subsequent riders utilized again and again until it became an obvious user-created route. These

routes are among the most ecologically harmful routes on the National Forests, and problems with existing routes must be addressed if water quality is to be protected. Allowing the Forest Service to "prioritize" which routes are addressed, without placing an additional requirement that they eventually address ALL of the problem routes, provides the Service with an easy excuse to never deal with existing problems. In my experience and based on my observations, Forest Service budgets are always strained, and while prioritization is a must in any strained budget, allowing for a permanent pass because of a lack of resources will never result in improved water quality.

26. The BMPs also propose that monitoring will identify problematic routes, which will lead to closure or repair in the field. My experience demonstrates that this is not the case. For example, with regards to the Cedar Ridge trail where OHVs and abandoned road discharges combined to cause 16" of sediment deposit into the downslope stream area, the Forest hydrologist told me when I contacted them that the problem was already known by the Forest to exist, but that no restoration work was being done on the problem due to the lack of adequate funding for any corrective action. More than a year later, that route still remains fully open to OHV use and no corrective action has been taken. Over the extremely wet spring period of this year, significant amounts of new sediment continued to wash into the seasonal stream drainage. Based on my experience, routine maintenance activities will not prevent further significant discharge from occurring on that trail. At this point, years after the fact, nothing has still been done.

27. In fact, over the years CSERC and other organizations such as PEER have provided the Forest Service with verbal and photo descriptions about *numerous* other specific OHV routes that are discharging sediment into streams. Similar to the example above, many such routes have been allowed to be open to continued OHV use without the Forest Service taking any "immediate corrective action" to fix the major ruts, water crossings, or other resource problem. Thus the State Water Board cannot accept as credible Forest Service claims that that the agency will systematically monitor and take immediate corrective action. In sum, immediate corrective action following monitoring may be a well-intended vision, but it certainly does not correspond to the *actual* constraints that I have observed that prevent such corrective actions from being implemented. (See

CSERC letter of April 14, 2010 to the State Water Board showing photos of this OHV route/road impact on water quality).

28. Another problem with monitoring in regards to the G-Y-R protocol is that apparently only those trails that evidence a "red" rating with regards to watercourse crossings will receive specific attention from resource specialists. This fails to acknowledge the importance of the condition of other elements monitored by the G-Y-R protocol that might implicate water quality, such as water control, erosion off-trail, sediment traps, user-created trails, and routes on earthflows or other sensitive terrain. It also fails to recognize those trails with a "yellow" rating. Addressing a "yellow" rating when it is first discovered may be critical in avoiding larger water quality problems from occurring in the future. In my opinion, by the time a trail would be rated as "red" under the protocol, it would already typically be a source of significant sediment discharge to streams during the winter and spring storm season.

29. In my experience, when a Forest Service staff makes the judgment that a rutted hill-climb up a steep slope does not pose significant risk to water quality based upon his or her visit during the dry season, that judgment will not prevent sediment-laden water from pouring down that OHV route during thunderstorm events, heavy winter storms, or spring snowmelt. If no timely monitoring of existing OHV routes on a given national forest is done by trained, qualified FS staff in a given year, no identification of water quality problems on those routes will even be identified – let alone corrected. If watchdog organizations report site-specific water quality problems on poorly maintained OHV routes, but a lack of agency funding prevents corrective action, the problems will continue. Positive written intentions need to be tied to required monitoring and required actions when thresholds or triggers are met or exceeded. Theses checks and triggers are lacking in the BMPs, which in my opinion will lead to further water quality impacts that have not been evaluated in this Waiver process.

30. I also strongly disagree with the BMPs' assumption that the "closure" of a route means there will be no further water quality impacts. In my experience this assumption is clearly unwarranted. In fact, any casual visit to a national forest would reveal that the Forest Service simply has no enforcement capability to effectively restrict OHV travel to designated trails. Using the

Cedar Ridge area on the Stanislaus Forest again as a clear example, fresh use on multiple unauthorized OHV routes is presently evident in many locations despite a published MVUM map restricting use to officially designated routes. The State Water Board cannot rely upon Forest Service claims that OHV use will be restricted to legal routes when the agency openly admits that it cannot halt OHV use if riders choose to ignore maps or signs. Further, it is my experience that official "closure" of a route does not necessarily mean that the Forest Service will ever put up "closed" signs to put riders on notice. Instead, in most cases it is impossible for an OHV rider to distinguish between open and closed routes, which are typically not signed either way.

31. Another problem with the BMPs is their reliance on wet weather closures to avoid water quality impacts. For example, the one BMP directive under "Operations" requires national forests to: "Close trails or restrict OHV use when the potential for sediment delivery is high or during periods when such use would likely damage the tread or drainage features." However, this BMP is at odds with actual Forest Service OHV management regulations, many of which require a certain percentage of OHV routes to be open year round. Using the Stanislaus National Forest again as an example, the Stanislaus Forest approved a ROD for Motorized Travel Management in December 2009. That ROD established approximately 1/3 of OHV routes within the Stanislaus Forest as fully open to OHV use year-round without any of those OHV routes being closed seasonally due to times of heavy rainfall, snowmelt, or other periods when sediment delivery is high. Just in that national forest's Motorized Travel Management plan, the Stanislaus Forest added 37.32 miles of hydrologically connected OHV routes to the Forest's legal motorized system. Failing to close those routes during times of extremely wet weather directly conflicts with BMP 4.7.6, yet the requirement to keep many OHV routes open year-round was a basic regulation approved by the Forest and upheld by the Region. Further, even where higher elevation routes may be seasonally closed, in my experience this does not prevent significant sediment discharge due to the presence of considerable dislodged soil due to riding during the dry summer season.

32. Based on my decades of involvement in this issue, and as the above examples reveal, my opinion is that without clear thresholds, criteria, or ways to measure the risk of OHV routes for sedimentation, diversion of flows, or other problems, then BMPs will end up being quick judgments

or opinions made by low-level field staff who check a box on a form, Actions will not be based on a sound understanding of what types of erosion and route damage present a threat to water quality. Further, even if those judgments *are* sound, the lack of adequate personnel to perform desired monitoring along with the lack of funding to actually implement corrective actions will render many BMPs inadequate. Without specific, mandated monitoring requirements to be applied to all national forests within California, and without appropriate significant consequences that would be triggered by the inability of a national forest to halt OHV-generated water quality impacts, water quality will not be protected. Without consequences for violations of OHV use requirements, then any list of BMPs cannot be assured to adequately protect water quality from OHV use for the purpose of granting a waiver.

33. In sum, it is my opinion that the proposed BMPs for OHV are ineffective because they provide inadequate management prescriptions for existing OHV routes and no clearly triggered consequences for national forests that allow OHV use that individually and cumulatively results in excessive sedimentation to wash into receiving water bodies.

GRAZING IMPACTS TO WATER QUALITY

34. In addition to the extensive watershed and water quality impacts caused by OHV use, I have personally observed extensive watershed and water quality impacts from livestock grazing in recent years. For all of the years that I have recreated, done scientific research, and engaged in watchdog monitoring on National Forest lands, I have personally observed highly significant resource degradation caused by livestock. Cattle are by far the most common cause of stream bank sloughing, where stream banks end up being chiseled by livestock hooves as the animals climb up and down to access water. Entire sections of stream banks can easily be seen year after year as they either slide directly into flowing streams or crumble and result in forest streams becoming wider and shallower, rather than retaining the more natural condition of being deep and narrow. The wider that streams become and the more shallow the water, the warmer the water during hot summer season conditions.

35. I have also personally observed over all of my years of visits to National Forest lands that cattle hang out during hot season periods in close proximity to streams so as to access

water readily. The result is often easily visible. Both wet and dry meadows are visibly over-grazed so as to remove much of the tall grasses, bushes, and riparian vegetation that would shade the stream and keep it cool. Heavily grazed areas where livestock use is concentrated also result in extensive bare patches of soil where pocking from hooves, wallows, heavy grazing, and other livestock impacts all combine to remove vegetative cover. These kinds of grazing impacts that affect water quality and water temperature add to the direct impacts to water quality and watershed resources caused by OHV use.

36. Despite claims made by the Region that livestock management is improved from past practices, our non-profit Center finds extreme resource degradation caused by cattle every year. Our staff biologist, Lindsey Myers, and associated trained staff have measured meadow grasses for utilization for many years. Measurements are taken before cattle come onto a grazing allotment on National Forest lands, and then during the season or at the end of the season. Carefully followed protocols are followed to measure selected grass species along identified meadow transects, and then to plug in the measurements into data sheets to produce utilization results. Again and again our Center has documented both with measurements and with photos that meadows and stream areas are routinely overgrazed far beyond the standards allowed in USFS allotment management plans.

37. A key challenge, however, is that the Forest Service itself is often incapable of measuring the majority of meadow transects in order to determine whether or not livestock permittees met or exceeded thresholds for forage utilization. Within the Stanislaus Forest, for example, many years USFS staff are able to only measure 30% or less of the transects where measurements are supposed to be taken to quantify performance by the range permittees. The rest of the allotment transects are not monitored by any USFS personnel. Instead, the Forest Service accepts "self-monitoring" by the permittees themselves, although in most cases the permittees have never met any test for competence in monitoring forage utilization nor can there be considered to be any neutrality in asking the permittees to self-incriminate themselves for potential violations. Thus, while our staff biologist (who has attended USFS trainings and has accompanied USFS personnel in monitoring at meadow transects) is deemed to be unacceptable as a source of measurement information for data collection of forage utilization measurements, the highly biased livestock

permittees are deemed to be acceptable for determining compliance with threshold standards. This practice is typical of the Region's failure to provide clear, neutral, consistent, and science-based monitoring for the impacts of livestock grazing on meadows and stream areas when it comes to the standards set for vegetation consumption.

38. Of greater concern is the fact that after more than 15 years of intensive monitoring of livestock grazing within the Stanislaus National Forest, our Center has never yet been able to convince the Forest Service to comply with its own Forest Plan requirement to monitor stream bank stability in response to livestock impacts. Although the Stanislaus Forest Land and Resource Management Plan (1991) sets a clear threshold for stream bank stability in areas where livestock grazing takes place, the Forest has never established any protocol for measuring stream bank stability, nor has the Forest ever made any concerted effort to actually measure or to enforce the standard. Similarly, despite years of complaints by our Center and many members of the recreating public about the obvious water quality impacts caused by cows in areas of high elevation recreation, the Forest Service has consistently chosen not to monitor for water quality contamination in any manner that is consistent with State Water Board protocols. Thus, despite the fact that our Center has submitted in both 2009 and 2010 highly detailed Water Study results from an independent laboratory proving extensive violations of water quality by livestock along forest streams, the Forest Service continues to avoid doing water quality testing in a fashion that would show compliance or violations of Basin Plan standards.

39. The impacts from livestock to water quality in the upper elevation portions of the mountains is especially egregious for public health due to the fact that tens of thousands of recreational visitors hike, camp, backpack, kayak, swim, fish, and otherwise tie their recreation to water in the higher elevation lands of not just the Stanislaus National Forest, but national forests throughout the Region. I have repeatedly observed cows standing in national forest streams, lakes, and wetland areas defecating, trampling, pocking, and over-grazing riparian vegetation. Yet despite more than 15 years of photographic evidence submitted to the Forest Service, two major water quality studies, and direct requests to Regional staff pressing for changes in livestock management on National Forest lands, livestock grazing continues as usual. Within the Stanislaus National

Forest, the majority of permittees do not have consistent herders or even a solitary rider present daily during the grazing season. Instead, each permittee's herd is allowed to drift for days at time (often concentrating in wet meadows or along riparian areas) until the permittee or hired riders return to the National Forest to move cows before leaving again. Thus, unmanaged livestock use on National Forest lands is the norm throughout California.

40. An equally problematic impact from livestock grazing is the fact that the Forest Service does not take action to ensure that livestock only grazes on suitable and capable National Forest lands. In the limited number of Allotment Management Plans that have been fully completed and brought up to Regional standards, the Forest Service distinguishes between lands that are suitable and capable and lands that do not meet that criteria. Those unsuitable or non-capable lands are often lands with shallow soil, minimal vegetative cover, extremely short growing seasons, evidence of past resource degradation, or other problems that make them inappropriate for livestock grazing. Yet the Forest Service routinely allows livestock to graze intensively on these incapable and unsuitable lands that are widely intermixed with lands deemed capable and suitable.

41. For all of these reasons, it is my personal observation that past and current management policies related to OHV use and livestock grazing on National Forest lands within the Stanislaus Forest result in a wide range of easily discernable impacts to water quality and watershed resources. Most significantly, OHV riders who use steep routes that run up and down hillsides create ruts that funnel sediment directly into downslope water. For livestock, the crumbling, sloughing, pocking, and denuding of stream banks, and the concentrated presence of livestock in close proximity to water all combine to directly affect water quality and aquatic species.

42. Our Center has for more than 15 years carefully adopted and followed U.S. Forest Service forage utilization monitoring protocols in field studies at the specific meadow transect measurement locations selected by Forest Service range management officials. In the last several years we have submitted reports, which have identified meadow areas with obvious grazing violations have literally been put on agency shelves without their information leading to management changes or consequences for permittees who violated their permit provisions. Our staff biologists have carefully followed State Water Board protocols for water sampling of National

Forest streams both before and after cattle come into the forest for summer grazing. Immediately prior to the presence of livestock, stream samples show water quality to be within acceptable Basin Plan standards. But in both 2009 and 2010 Reports, , samples taken as required by State protocols often showed violations of Basin Plan standards (for levels of fecal coliform) once cattle were present. All samples were tested at a certified, independent testing laboratory used by various government agencies. Thus, our Center has applied the best available science to both measure resource impacts due to grazing of vegetation along streams and water quality sampling for fecal coliform contamination. Yet even when this extremely exhaustive monitoring information has been provided to the Forest Service, no changes in grazing management have been required in areas where violations were shown. Given that so much of the Waiver relies upon the Forest Service to responsively adjust practices in an adaptive manner to protect water resources, my personal experience underscores the inability of the Forest Service to take such corrective actions in a timely manner.

43. I declare under penalty of perjury that the foregoing statements are true and correct to the best of my personal knowledge.

Date: August 23, 2011.

/s/ John Buckley
JOHN BUCKLEY