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Mr. Roger Briggs, Executive Officer
Regional Water Quality Control Board
Central Coast Region
895 Aerovista Place, Suite 101
San Luis Obispo, California 93401

Dear Mr. Briggs:

The California Department of Forestry and Fire Protection (CDF) has reviewed the Central Coast Regional Water Quality Control Board's (CCRWQCB's) revised "Draft General Conditional Waiver of Waste Discharge Requirements – Timber Harvest Activities in the Central Coast Region," including draft resolution, staff report (for the Board meeting of July 8, 2005), the draft negative declaration prepared by the lead agency pursuant to the California Environmental Quality Act (CEQA), and other attachments. CDF continues to support a process that is simple, clear and transparent to the regulated parties, interested public and responsible agencies. The current proposal is largely unchanged from the earlier version which CDF commented on in our letter dated March 3, 2005. CDF's six recommendations for modifying the proposal and the reasoning supporting our recommendations remain basically unchanged and are based on past published research, our CDF/Board of Forestry and Fire Protection (BOF)/Monitoring Study Group (MSG) monitoring results over the past decade, and our professional experience. We look forward to assisting in any way we can to ensure your final program provides a clear and defined process allowing for more consistency in application as well as objective certainty.

Our primary concerns are as follows:

1) The Eligibility Criteria, as currently proposed, are somewhat arbitrary and are not based on, and in some cases are contrary to, available scientific research;

2) The Eligibility Criteria, as currently proposed, would require an unreasonably large percentage of plans to perform Tier III and IV levels of monitoring. More than half of the plans would require Tier III or IV monitoring, based on the Attachment 5 of the Staff Report prepared for the July 8, 2005 meeting.

3) The Monitoring and Reporting Program, as currently proposed, would result in monitoring plans for individual THPs (particularly under Tier III) which are not efficient and are excessively expensive. Typically, such plans do not take full advantage of implementation/effectiveness

monitoring and forensic monitoring and may include types of monitoring that produce inconclusive results in a regulatory setting as opposed to a long-term research setting.

The staff report states that "In the case of timber harvest activities, the overarching goal is for monitoring to demonstrate that the proposed activities comply with Order conditions and impacts to waters quality and beneficial uses are not occurring." CDF strongly supports this goal; however, CDF believes that goal can be reached more efficiently and effectively if the Board incorporates the following six recommendations into any General Conditional Waiver. Revising the Eligibility Criteria based upon available scientific research as outlined in our first three recommendations would address concerns one and two. Revising the Monitoring and Reporting Program (MRP) as outlined in the second three recommendations would help address concern three. Please consider all six of our recommendations and supporting information prior to any decision regarding adoption of a General Conditional Waiver.

Eligibility Criteria Recommendations

1. **The current version of the Cumulative Effects Ratio (CER) Index states: "If timber harvest activities are proposed in a 303d listed watershed (impacted by sediment or temperature), then the CER is always considered high. Water Board staff develops the 303d list based on analysis of the available data." CDF recommends retaining 303d listing as a factor in determining the CER for tiering purposes and dropping the CER index, which lacks scientific credibility in its current form.**

The **Cumulative Effects Ratio (CER) Index** in its current form is calculated by simply adding the acres harvested in the past decade in a planning watershed, plus acres in a proposed THP, and dividing the total by the total acres in the planning watershed. This approach assumes that past management activities result in impacts to all acres equally when clearly this is not the case. Beschta and others (1995) summarized cumulative effects knowledge related to forestry operations in Oregon and concluded that using harvest levels as a surrogate for impacts is a simplistic approach that does not account for regional or watershed variability, harvest location, yarding system, roading, etc.; and assumes a direct causal relationship between size of the harvested area and magnitude of impact without regard to other factors when this is often not the case. Vast amounts of watershed literature supports the conclusion that tractor logging, roading near streams, and broadcast burning produces greater water quality impacts when compared to aerial-system yarding, roading near ridge-tops, and selection logging without harsh site preparation treatments (see for example Rice and Datzman 1981, Cafferata and Spittler 1998, Lewis 1998, Lewis and others 2001).

The CCRWQCB document specifies that a CER value of greater than 15% equates to a rating of high. Insufficient research has been conducted to conclude this is

the proper value for Central Coast watersheds. Ligon and others (1999) wrote in their Scientific Review Panel Report that the environmental community advocated a maximum harvest of 10% to 15% per decade, but the Scientific Review Panel suggested a value from 30 to 50% per decade as a "red flag" (not a moratorium), depending on factors such as geology, harvest prescriptions, past disturbance, etc. Instream monitoring work completed by the US Forest Service -- Pacific Southwest Research Station (USFS-PSW) and CDF over the past 40 years sheds some light on this issue. Harvesting of approximately 45% of North Fork of Caspar Creek with clearcutting in three years did not cause large changes in watershed physical or biological variables in a moderately stable geologic formation (Ziemer 1998, Lewis 1998, Cafferata and Spittler 1998, Nakamoto 1998, Bottorff and Knight 1996).

Past watershed assessment work (largely office-based) has often utilized indices such as road density, riparian road density, stream crossing density, inner gorge as a percent of total area, SHALSTAB (percent of road network in high and chronic categories), SHALSTAB (percent of total area in high or chronic categories), amount of area with deep-seated or slow moving landslide features, etc. (CDF 1999). These are more meaningful variables in estimating watershed risk for sediment production than simply the amount of area covered in a given decade and should be considered by your Board in your final decision.[1]

The CCRWQCB document uses Klein's (2003) report on turbidity associated with logging and roading to justify the 15% threshold. It states that Klein's report suggests that there are thresholds of harvested acres beyond which additional harvesting will cause large water quality problems. Beschta and others (1995) write that natural systems rarely recognize discrete thresholds and can respond incrementally and interactively to change. Mr. Klein states in his report that while turbidity levels might be decreased by reducing the density of roads in a watershed and limiting the annual rate of timber harvest, his "*results should be considered preliminary and not be used alone for policy decisions or regulatory standards"* indicating that while his study argues for quantitative limits on annual harvest rates, they should be ". . . *customized to accommodate the variability in erosional sensitivity found within the northcoast*." He further sates: ". . . *a stronger analysis, one that includes a greater sample size of northcoast streams, is needed to establish <u>defensible</u> harvest rates that ensure protection of beneficial uses*" (emphasis added). We believe that insufficient work has been completed in Central Coast watersheds to determine that a CER of 15% in one decade would place a watershed in a "high" category.

Additionally, Mr. Klein's work on turbidity was completed prior to the work CDF helped fund on suspended loads and stream health with Drs. Madej, Wilzbach, and Cummins and their graduate students (Madej and others, in press; Hadden and others, 2004). This work provides new information regarding impacts of suspended load (both organic and inorganic) on fish feeding behavior and macroinvertebrate impacts.

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[1] Note that this list is only a partial list of potentially important variables related to sediment production that can be categorized in a spreadsheet.

Graduate student Samatha Hadden (Hadden and others, 2004) reported both field and laboratory studies reveal that while the foraging efficiency of juvenile salmonids was decreased by increased turbidities, fish continued to capture prey at turbidity levels in the range of 40-50 NTU's.

In general, the CER Index methodology seems to be a much simplified Disturbance Index (DI) or Equivalent Roaded Area (ERA) type approach. Numerous problems with the standard ERA method have been reported in the past. For example, MacDonald and others (2004) state that this approach does not explicitly separate changes in flow from changes in sediment, there are excessively long recovery curves, the effect of an activity does not vary with its location in the watershed, and there is little validation at site or watershed scales. McGurk and Fong (1995) found a modified ERA indexing management impacts close to watercourses correlated to in-stream parameters, but the standard USFS Equivalent Roaded Area (ERA) index across whole watersheds did not. They reported the standard ERA technique was uncorrelated to aquatic macroinvertebrate diversity, but the modified ERA, restricted to within 100 meters of first and second order streams, was correlated.[2]

Additionally, the degree to which logging operations will impact a given watershed is dependant on how well the Licensed Timber Operator (LTO) implements the requirements specified in the plan and the Forest Practice Rules—a factor that cannot be accounted for in this spreadsheet approach. Rice and Datzman (1981) reported that operator performance may be as great a determinant of logging-related erosion as are site characteristics.[3]

2. CDF recommends using a standard definition for drainage density (without weighting for watercourse class, simply mi/mi^2). This index is supported by watershed research in California.

The newly defined "weighted" **Drainage Density Index (DDI)** is inconsistent with the scientific literature. The standard definition for drainage density is simply the total miles of any order stream divided by watershed area in square miles. Drainage density has been shown to be important for predicting sediment yield, and has often been used in combination with other variables to predict sediment yields through multiple regression techniques. Road density and drainage density (length of streams/unit area) has been used in the past as a surrogate for watershed condition (Jones and others 2000). More roads and more streams equate to more interactions between them (i.e., stream crossings), and stream crossings have recently been shown to be high-risk sites for sediment delivery in both quantitative and qualitative monitoring studies conducted in California (MacDonald 2002, Cafferata and Munn 2002). Sediment generation at

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[2] In McGurk and Fong's (1995) analysis, a % ERA of 15 percent inside the 100 m buffer strip represented the point at which the Shannon-Weaver Biodiversity Index for in-stream invertebrate diversity dropped by 50 percent.

[3] This indicates the importance of CDF, CCRWQCB and RPF active compliance inspections.

crossings is not dependent on the watercourse class present. For example, in the Lake Tahoe basin, studies have shown a correlation between drainage density and road density, and the relative sediment loading to a watershed (Hill and Nolan 1990; Reuter and Miller 2000). Drainage density and road miles together explained 83 percent of the variation in sediment yield in the Tahoe basin. Drainage density was the most important variable for explaining sediment yield ($r^2 = 0.77$), but adding road density improved the correlation with sediment generation.

3. **CDF recommends not using the existing version of the Soil Disturbance Factor and working with CDF and CGS staff to produce a scientifically credible revised Soil Disturbance Factor.**

The **Soil Disturbance Factor** described in the document seems to be cumbersome and would require field validation to determine its worth. It appears likely that individual Registered Professional Foresters (RPFs) would use this procedure differently. Important factors for sediment that do not appear to be accounted for in this type of approach include: having or not having a valid mass wasting avoidance strategy; having or not having an aggressive road management plan and implementation timeline, having or not having adequate road maintenance. These types of approaches are proving to be important for reducing sediment inputs on PALCO timberlands in the highly contentious Elk River watershed (PALCO 2004).

At this time, we are not aware of a readily available "desk-top", office-based methodology for rating the hazard of sediment yield to watercourses that can take into account both surface and mass wasting erosion processes. The WEPP Forest Road Erosion Predictor and Disturbed WEPP models can estimate surface erosion alone for very small areas (Elliot and others 2000), but would not account for landsliding potential, a dominant erosion process in the Santa Cruz Mountains.

Monitoring and Reporting Program Recommendations

4. **CDF recommends limiting turbidity monitoring to above-and-below measurements at selected, high-risk, newly constructed or reconstructed Class I and II watercourse crossings. CDF recommends against other types of turbidity monitoring since adequate pre-project data will not be available to make meaningful comparisons with post-harvest data.**

In general, instream water column water quality compliance monitoring will be triggered too frequently with this Monitoring and Reporting Program for Proposed Conditional Waivers. We have stressed to the CCRWQCB in the past that THP-scale sediment monitoring should focus on locating problem areas in a timely manner and correcting them if possible rather than on instream water column monitoring (Cafferata 2004).

We have informed the CCRWQCB that without adequate pre-project turbidity data (which may mean several winters of data collection[4]), only turbidity measurements taken above and below crossings are meaningful. USFS-PSW Mathematical Statistician Jack Lewis reported this concept at the Interagency Water Quality Monitoring Workshop held in Santa Rosa in 2002 (North Coast Regional Water Quality Control Board (NCRWQCB) and CDF 2002). Since this type of monitoring is expensive and not all crossings are high-risk, CDF recommends revising the first sentence in D.2 Turbidity in the MRP to read:

> *The Discharger shall monitor all selected high-risk, newly constructed or reconstructed Class I and II watercourse crossings within the timber harvesting plan area in place after October 15th for turbidity (a hand held turbidimeter is acceptable for this purpose).*

Monitoring and Reporting Program requirement D.2, Turbidity, requires turbidity measurement above and below crossings, and says that "Turbidity monitoring may be required as determined by the Regional Board Executive Officer if no newly constructed or reconstructed crossings exist within a proposed THP and the plan has activity within a Class I or II Watercourse Lake Protection Zone (WLPZ)." This sentence appears to be open-ended and will not provide assurance to landowners regarding monitoring requirements. CDF recommends striking this sentence from the MRP. We have previously reported to the CCRWQCB that instream monitoring to determine changes in sediment loads and turbidity directly related to a THP is essentially a research level project (Cafferata 2004).

As stated in previous correspondence with you, we support visual (or hillslope) effectiveness monitoring and forensic monitoring to locate and correct sediment-producing sites in a timely manner if possible. These types of monitoring, along with compliance/implementation monitoring by CDF, CCRWQCB and/or the landowner are appropriate for a general waiver process and are largely consistent with the monitoring adopted in April 2005 by the CVRWQCB.

5. We recommend changing the sediment release monitoring requirement to 5 cubic yards of delivered material to a stream channel, rather than 1 cubic yard.

CDF believes that the sediment release reporting requirement of 1 cubic yard of soil will be very difficult to achieve in the field. Our previous comments to the CCRWQCB have indicated that 5 cubic yards delivered to a watercourse is more appropriate. The requirement for the plan proponent to implement a "road inventory program" within the plan area is appropriate and valuable.

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[4] Even with several winters of data, scientists such as Dr. Lee Benda state that we will not know true background levels in watersheds subject to episodic landsliding events.

6. **We recommend limiting THP-related water temperature monitoring to Class I watercourses and primarily to those Class I watercourses with proposed harvesting in the WLPZ and which are 303(d) listed as impaired for water temperature.**

Water temperature monitoring is not necessary in most cases due to the very high canopy requirements in effect through the implementation of the Threatened and Impaired Watersheds Rule Package (14 CCR §§ 916.9 et al), part of the current Forest Practice Rules. In the few cases where water temperature monitoring is deemed necessary, it can be accomplished relatively easily with small, electronic recording dataloggers. This type of monitoring is most appropriate if harvesting has occurred in a Class I watercourse WLPZ within watersheds that have been declared as temperature impaired through a 303(d) listing. However, relating these measurements to THP impacts should also include collecting pre-project background data.

In summary, there is strong scientific evidence to support the changes contained in the above recommendations. Incorporating these six recommendations will make the Central Coast Regional Water Quality Control Board's "Proposed Timber Harvest Monitoring and Reporting Program" more efficient, effective in protecting water quality, and more scientifically defensible. We emphasize the need for a program that can be easily understood and applied by Registered Professional Foresters during the preparation of Timber Harvesting Plans. This will ultimately result in more effective timberland management within your region and in expedited review of Timber Harvesting Plans, thereby benefiting your regional staff, our THP review staff and the plan submitter as well. As currently proposed, the General Conditional Waiver may have potentially significant indirect environmental effects which have not been considered during your initial study as required pursuant to CEQA or mitigated to a level of less than significant (ref. 14 CCR §§ 15063 and 15064 (d) and (e)). The excessive regulatory costs to landowners associated with the CCRWQCB adopting these regulations will increase economic pressure to convert private forest lands from timber management to other uses, including agriculture and rural development. This increase in conversion to non-timber land use will likely lead to potentially significant individual and cumulative impacts on the environment, including: forest fragmentation; extirpation of sensitive species; introduction of exotics; increased sedimentation; degraded water quality due to agricultural chemical use; changes in population and the need for public services; increased traffic; and, increased fire hazard associated with an expanding wildland-urban interface. CDF believes these potential significant impacts will be lessened by adopting a General Conditional Waiver that is as efficient and cost-effective as possible, incorporating CDF's recommendations.

If you would like to discuss any of these points in greater detail, please do not hesitate to contact us.

Sincerely,

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Deputy Director, Forest Practice

By
Clay A. Brandow
Watershed Specialist
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And
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