Dennis Jackson - Hydrologist

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Howard Kolb
Central Coast Regional Water Quality Control Board
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re: Timber Harvest Program Update – Monitoring and Reporting Program

Dear Howard:

Here are some of my suggestions to improve the Monitoring and Reporting Program which supports the THP waivers. I sent you a separate letter (March 17, 2005) describing a method to determine what the recommended turbidity should be at any time after the end of a storm. I also sent you on letter dated March 7, 2005 describes changes to the Eligibility Criteria fro the THP waivers. All of the letters I have sent have been sent as e-mail attachments.

Monitoring Storms

You have defined the minimum storm that requires monitoring of THPs to be 2 inches in 24-hours. I recommend that prior to 12/24 each year, storms that produced 1.25 inches in 24-hours should be monitored and that after 12/24, storms that produced 2 inches in 24-hours should be monitored.

In my March 17, 2005 letter I analyzed the City of Santa Cruz's 15-minute turbidity data collected during the 2004 water-year. I found that between October and 12/23/2003 there were 13.5days with turbidity exceeding 25 NTU occurred out of a total of 26 such days. The remaining 12.5 days with turbidity greater than 25 NTU occurred after 12/24/2003. Slightly over half the days with chronic turbidity occurred during the first 54 days of the 166 days of record. In the 2004 water-year there were no storms that produced 2 inches in 24-hours prior to 12/24/2003.

Your proposed minimum 24-hour rainfall is too high and would not result in any monitoring of early storms resulting in missing over half of the days of chronic turbidity. In addition to my analysis of the City's 15-minute turbidity data, the Caspar Creek studies have shown that timber harvest increased the suspended sediment load during the early season storms.

Designation of a Rain Gauge

Since THP monitoring is triggered by a specified amount of rain in a 24-hour period it is important to clearly define where the rainfall is to be measured. One approach would be to require that a standard rain gauge be set up at each THP. A major drawback with this approach is that someone would have to drive out to read the gauge. If a storm has just past or is still underway, driving out to the THP could damage the road surface and may deliver sediment to the stream system. A superior alternative would be to use an established station whose record is available from the Internet.

Table 1 is a list of real-time precipitation stations that are suitable for THP water quality monitoring. The record for these stations is posted on the Internet by the Department of Water Resources (DWR). The attached list contains hyper-links to the data for each station listed. Stations have been included from the Sant Cruz Mountains, Salinas River and Big Sur coast to cover most areas within the boundaries of the Central Coast RWQCB that might support timber operations.

The closest rain gauge to the THP, of appropriate elevation, would be chosen as the rain gauge to define the occurrence of storms that would require monitoring. However, more than one station should be designated since all of the listed gauges are subject to periods of no record. Substitute stations should be chosen on the basis of a correlation analysis of all the records. The RWQCB staff should select the rain gauge to be used to trigger water quality monitoring events and to define the end of the storm. The RWQCB staff should also select a backup rain gauge in case the primary gauge has missing record during critical time periods.

Table 2 is a list of real-time precipitation stations maintained by the California Department of Forestry. The stations in Table 2 are not suitable for THP water quality monitoring since they tend not to be maintained in winter. CDF operates them to determine risk of fire hazard.

End of Storm

I have not seen a specific definition for the end of a storm. I propose that the end of a storm be defined as the first six-hour period of no rainfall following the start of rainfall. The time of the end of the storm could be taken as the first hour of the six-hour period of no rainfall.

If rainfall resumes after the six-hour dry period, it would be considered a new storm. No monitoring should occur after a storm if it is followed within 12 hours by subsequent storm that produces more than 0.25 inches in six hours. This restriction is suggested to reduce the risk of vehicles traveling on saturated road surfaces.

Number of Storms to be Monitored

A minimum of four (4) storms should be monitored each year. The following storms should be monitored each year that monitoring is required. The rainfall amounts would be measured at the rainfall station selected by the RWQCB staff, during their review of the THP, to trigger monitoring events and to determine the end-of-the-storm.

- Two (2) storms that produce more than 1.25 inches in a 24-hour period prior to December 24.
- Two (2) storms that produce more than 2.0 inches in a 24-hour period after December 24.
- All storms producing more than 4.0 inches in 24-hours.

In most years a maximum of four storms would be monitored. In years with intense rainfall additional monitoring would be required.

Implementation/Effectiveness Monitoring

The proposed Monitoring and Reporting Program (MRP) limits implementation/effectiveness monitoring to visual monitoring and photo monitoring. In my opinion, implementation/effectiveness monitoring should include turbidity monitoring in all watercourses that are flowing during required monitoring times.

Visual Monitoring

In a phone conversation recently we discussed visual monitoring. You claim that visual monitoring is appropriate for THPs because there should be no discharge of sediment. I mentioned that waivers are necessary for THPs because the federal EPA has not certified the California Forest Practice Rules (FPR) as Best Management Practices. So, the assumption that there will be no sediment discharge from a THP is unwarranted. You countered that you are not relying solely on the Forest Practice Rules. While I am pleased that you are willing to impose additional requirements beyond the FPR for a THP to be granted a

waiver, I am concerned that the additional requirements that you seek to impose have not been proven to protect the beneficial uses of water from sediment generated by a THP or its associated road system.

No proof exists that a given THP done under the FPR will not deliver some sediment to the stream channel network. While requiring a THP to adopt additional protective measures may help reduce sediment delivery to the streams it is unknown if the specific measures you propose are sufficient to eliminate the risk to water quality from any given THP. Therefore, it is necessary to require water column monitoring, including in-stream turbidity monitoring, for every THP that is granted a waiver to demonstrate that;

1. the conditions that were required by the waiver are properly implemented
2. the required waiver conditions are protecting water quality.

Visual monitoring can not accomplish these objectives. Visual monitoring may be able to detect significant failures such as a blown-out culvert but it can not detect the chronic bleeding of turbidity into a stream. The literature reveals that turbidity levels as low as 25 NTU stress salmonids. I doubt that most people can tell the difference between water samples with 20 NTU, 25 NTU or 30 NTU levels of turbidity.

The MRP does give some guidance on *where* to do visual monitoring (Item 4, Attachment 2 for February 2005 Board meeting). The MRP require that "visual monitoring points shall include all roads, water coarse crossings, landings, skid trails, water diversions, all watercourse confluences, known landslides, and all mitigation sites in the timber harvest plan area." This is insufficient since it does not specify that all flowing watercourses, during the required monitoring times, should be monitored. If a watercourse has no crossings and no confluences within the THP boundaries that watercourse would not require monitoring under the proposed guidelines. Such a watercourse might be adversely affected by the THP by sediment laden sheet flow or by failed management measure upslope. It is even possible that an unknown landslide has failed during the storm and is bleeding into a Class III with no crossings that joins a larger stream downslope of the THP boundary. For a given THP, there is no reason to suppose that the Class-III watercourses flow into the Class II or Class I watercourses that are within the THP. So, it is necessary to monitor all flowing streams within the THP boundary during the required sampling period.

The proposed MRP offers no guidance on *how* to conduct visual monitoring. Since there are no standard methods proposed in the MRP, each individual forester will make up their own method, so there will be no consistency between THPs regarding the level of monitoring. More importantly, there will be no consistency on what defines a sediment discharge. Is slightly cloudy water flowing on the road surface a sediment discharge? Or does the water have to resemble chocolate milk before it is considered a sediment discharge?

There is also no QA/QC plan for the visual monitoring. All applicants for 319(h) grants that know that the State Water Resources Control Board and the Federal EPA require grantees to provide QA/QC plans for all monitoring or background data collection activities. The purpose of the QA/QC plan is to ensure that the data collected are meaningful and consistent. Failure to provide a QA/QC plan for a very subjective method such as visual monitoring will result in unreliable data.

There is also no guidance as to what a significant erosion feature look like. A road surface might lose 1-mm of fine sediment off its surface during a rainstorm. How would somebody visually monitor that loss? It would be easier to monitor the resulting chronic turbidity in the down-slope watercourses. While a millimeter of surface erosion does not sound like much it adds up. For example, one millimeter of surface erosion over 1,000 square-feet of road surface (10 feet wide by 100 feet long) would produce 3.28 cubic feet of material. This estimate does not account for the surface erosion from any of the cut or fill slopes on the example road, so the actual loss from a length of road would probably be higher than my estimate.

After the proposed Eligibility Criteria and the waiver criteria have been field tested for a period of at least two years, including a water-year with at least average rainfall, it may be acceptable to use visual monitoring on THPs that present a low risk to water quality but not before the EC and MRP have been field tested.

Monitoring Frequency

The MRP (Item 4, Attachment 2 for February 2005 Board meeting) states that:

> The Discharge shall monitor all visual monitoring points for existing or potential sources of erosion. The Discharger shall perform visual monitoring within 12-hours of storm events of two inches or greater within a 24-hour period. If a storm terminates or two inches is reached between the hours of 3:00 pm (1500 hours) and 9 pm (2100 hours) visual monitoring shall occur within 18 hours.

This seems to imply that once two-inches of rainfall has accumulated in a 24-hour period monitoring shall occur, even if it is still raining. This has the potential of requiring monitoring during a prolonged storm. Doing so may be hazardous to the people doing the monitoring and may pose a serious risk to water quality as a result of driving on saturated dirt roads. In my opinion, it would be better to require monitoring within 12 to 24 hours after the end of a storm. If a subsequent storm arrives during the required monitoring period monitoring should be required if the subsequent storm produces more than 0.25 inches during a six-hour period. Of course, I recommend requiring monitoring after storm events producing more than 1.25 inches of rainfall in a 24-hour period between October 15 and December 24 and increasing the trigger to two inches in 24-hours after December 24.

The MRP adds an additional stipulation for the determination of the second and third monitoring events by stating that

> The Discharger shall perform the next two monitoring events within 12 hours of the next two storm events (one monitoring event each storm) that include two inches of rain or greater within a 24-hour period and soil saturation (i.e., soil saturation typically occurs after about four inches of accumulated precipitation during the wet season (the wet season begins October 15 each year)).

This is cumbersome and confusing. This language should be replaced by following language based on the definition of a monitoring event that I recommend namely, requiring monitoring after storm events producing more than 1.25 inches of rainfall in a 24-hour period between October 15 and December 24 and increasing the trigger to two inches in 24-hours after December 24.

> **Monitoring Events One and Two**: The Discharger shall perform the first two monitoring events prior to December 24 and within 12 hours to 24 hours of the first two storm events (one monitoring event each storm) that include 1.25 inches of rain or greater within a 24-hour period
>
> **Monitoring Events Three and Four**: The Discharger shall perform the next two monitoring events after December 24 and within 12 hours to 24 hours of the first two storm events (one monitoring event each storm) that include 2.0 inches of rain or greater within a 24-hour period

The first two monitoring events are required to occur during the early season (October to December 24). The storms in this time period are likely to be relatively small but they also tend to have a higher turbidity level per cubic foot per second of water discharge than later storms. These efficient early storms may also account for a significant portion of the total time during the winter season that the turbidity is greater than 25 NTU. These early season storms wash the fine material that has accumulated on the ground surface and leaves near roads into the streams. These storms may not stress the integrity of erosion control measures on a THP but appear to account for a significant portion of chronic turbidity.

There is a higher probability of intense storms occurring after about December 24. These more intense storms will tend to stress the erosional control features of a THP and may even initiate slides.

The cumulative rainfall total will be greater than or equal to 3 inches by the time of the second monitoring event and will be at least 4.25 inches by the time of the third monitoring event. Therefore the mention of saturated conditions is not needed.

It is unreasonable to set a minimum number of monitoring events since the first winter after a harvest might be relatively dry and not have many rain storms that would trigger monitoring. I recommend that if the first year after the THP does not produce four storms that require monitoring then level of monitoring required by the MRP during the first year following a THP should be extended to the second year after harvest.

A minimum of two years of turbidity monitoring should be required for all THPs to test the Eligibility Criteria and the Monitoring and Reporting Program. In case the annual total rainfall at the gauge chosen to determine monitoring events is less than 80% of its long term average, an additional year of monitoring shall be required.

Photo-Point Monitoring

The photo-point monitoring proposed by the MRP appears to be useful and is described by a reasonable set of standard methods. The photo-point monitoring should produce a consistent level of quality in the photos from different THPs.

Photo monitoring of the stream channels may prove useful but there is no simple relation between the color of water shown in a photo and the level of turbidity in the water as measured by a reliable meter. Chronic turbidity is a serious threat to salmonids that should not be overlooked. Photo monitoring can probably detect gross changes in the turbidity of water but it probably can not detect small changes in turbidity near the chronic turbidity threshold of 25 NTU.

Turbidity Monitoring

All implementation/effectiveness monitoring should include in-stream turbidity monitoring of all flowing watercourses on a THP, regardless of Class, during the required monitoring periods. Turbidity greater than 25 NTU stresses salmonids. My March 17, 2005 letter to you outlines a method to determine the acceptable level of turbidity at any time after a storm event that produces a 1.5-year return period (bankfull) discharge. That method could be applied to additional data to determine the acceptable level of turbidity after various return period storms. I did not have access to early-season turbidity data of sufficient quality to develop curves for early season storms but acquisition of additional data should solve that problem. However, I expect to get additional turbidity data from the City of Santa Cruz and should be able to address early season turbidity levels.

Once additional turbidity data sets are analyzed it should be possible to determine is a given turbidity reading taken at some time after a storm was too high or was acceptable. Chronic turbidity indicates that the turbidity levels take too long to drop below 25 NTU. So, whether a turbidity level is not acceptable depends on its value and the time of the reading after the maximum turbidity. If a turbidity reading was judged too high, it should trigger forensic monitoring plus another round of sampling. If a turbidity value is less than 25 NTU then no further sampling would be required. However, a problem may still exist if the first reading below 25 NTU occurred excessively long after the end of a storm.

All in-stream water quality sampling must be done following a standardized procedure and a QA/QC plan. For example, when sampling above and below a watercourse crossing, the downstream sample should be collected first to avoid contamination of the sample by walking on the streambed to collect the sample from above the crossing.

Turbidity grab samples should be collected in a wide mouth sample bottles with a volume of roughly 500 ml. The mouth of the sample bottle should not be submerged. Submerging the mouth of the sampling jar may result in re-circulation of stream water within the jar and skew the results. For safety at higher flows,

the sample jar can be attached to a telescoping handle such as from a pole saw. Once the sample occupies about half the bottle it should be removed from the stream. The turbidity meter should be calibrated in the office. The turbidity meter sample cup should be filled from the sample bottle by fist closing the sample bottle and vigorously shaking it. A reading should then be taken. The procedure is repeated three or four times until the turbidity readings converge. The final reading is reported.

Additional detail, such as what is the acceptable accuracy and resolution of the turbidity meter and how often it should be calibrated etc, needs to be added to the above to have a complete procedure and QA/QC plan.

Required Action

As written, the Implementation/Effectiveness portion of the MRP described in Attachment Number 2 of the Staff Report for the February 2005 meeting does not specify any action be taken if a sediment discharge or other problem is found. I recommend that an additional section be added entitled "Required Action". This new section should specifically direct the monitor to begin the Forensic Monitoring procedure and to take the appropriate action to report the sediment discharge or problem.

Forensic Monitoring

Attachment 2 of the staff report for the February 2005 meeting describes how the Forensic monitoring is to be done. One of the tasks to be performed during Forensic monitoring is:

> If timber activities cause a discharge (sediment, soil, other organic material, etc.) into waters of the state, the Discharger shall measure instream turbidity (using grab samples) in the closest Class I or II watercourse downstream of the discharge.

Why are grab samples required only from the nearest Class I or Class II stream downstream of a sediment discharge? Why is sampling the closest downstream Class III stream excluded? If a spill or sediment discharge enters a Class III stream there is no guarantee that on a specific THP that the impacted Class III would necessarily join any other watercourse within the THP boundary. The impacted Class III may join a Class I outside of the THP boundary and the discharged or spilled material may adversely impact the beneficial uses of water off the THP. I strongly recommend that the following change be made to the above quote from the Forensic monitoring section.

> If timber activities cause a discharge (sediment, soil, other organic material, etc.) into waters of the state, the Discharger shall measure instream turbidity (using grab samples) ~~in the closest Class I or II watercourse~~ downstream of the discharge.

Water Quality Compliance Monitoring

Water quality compliance monitoring of the MRP is limited to temperature and turbidity. My comments on temperature monitoring are contained in my February 10, 2005 letter to the Regional Board.

Turbidity Monitoring

I am concerned that timber harvest activities may create new sources of turbidity. The new sources of turbidity may be either from a distinct feature such as a watercourse crossing or from more diffuse sources. All distinct near-stream features such as crossings should be monitored by the use of grab turbidity samples.

A review of the literature reveals that chronic turbidity as low as 25 NTU can stress juvenile steelhead. Trush has defined chronic turbidity to occur when turbidity exceeds 25 NTU for more than 10% of the winter season of October through April. During a storm the turbidity will reach a maximum value and then decline. Assuming that no additional rainfalls, the decline in turbidity will obey a power law when time is measured starting from the turbidity maximum. In my letter of March 17, 2005 I describe a method to determine a threshold curve for a storm that produces a 1.5-year return period water discharge. The threshold curve is a graph of the turbidity at any time after the turbidity maximum or the end of a storm. Turbidity readings at any given time after the turbidity maximum can be compared to the threshold curve. Values that plot above the curve represent a problem; values that plot below the curve are acceptable. If turbidity values from a sampling a THP fall above the threshold curve then forensic monitoring should be triggered to determine the source of the turbidity.

The above approach augments but does not replace turbidity sampling above and below distinct near-stream disturbed areas. All turbidity monitoring should follow the procedure outlined in the discussion of turbidity monitoring as part of implementation/effectiveness monitoring presented above.

Most handheld turbidity meters ($500-$700) are accurate to within 2% of the reading. Therefore, upstream-downstream differences of more than 5% of the upstream reading can be considered as real. Taking turbidity readings from multiple sub-samples of the grab-sample, as described in the Implementation/Effectiveness monitoring section, should produce consistent readings and increase the likelihood that observed differences of more than 5% are real.

Attachment 2 of the staff report for the February 2005 Board meeting states that:

> **D.2 Turbidity** - The Discharger shall monitor all newly constructed or reconstructed Class I and II crossings within the timber harvest plan area in place after October 15th for turbidity (a hand held turbidimeter is acceptable for this purpose). Turbidity shall be measured approximately 25 feet upstream and downstream of all newly constructed or reconstructed Class I and II road crossings. Turbidity monitoring may be required as determined be the Regional Board Executive Officer if no newly constructed or reconstructed crossings exist within a proposed timber harvest plan and the plan has activity within a Class I or II WLPZ

This direction excludes all existing watercourse crossings. However, it is known that existing watercourse crossings are sources of sediment and often fail catastrophically. Above and below existing crossings must be included in the list of places to monitor turbidity. In addition, the upstream and downstream end, within the THP, of all flowing watercourses within the THP boundaries should be monitored for turbidity.

I recommend the following changes be made to the language quoted above.

> **D.2 Turbidity** - The Discharger shall monitor all ~~newly constructed or reconstructed Class I and II~~ crossings **on flowing watercourses** within the timber harvest plan area in place after October 15th for turbidity (a hand held turbidimeter is acceptable for this purpose). Turbidity shall be measured approximately 25 feet upstream and downstream of all newly constructed or reconstructed Class I and II road crossings. **The Discharge shall also monitor the upstream and downstream end of all flowing watercourses within the THP boundaries for turbidity. All turbidity monitoring shall be done according to the standard methods described below.** Turbidity monitoring may be required as determined be the Regional Board Executive Officer if ~~no newly constructed or reconstructed crossings exist within a proposed timber harvest plan and~~ the plan has activity within a Class I or II WLPZ

The comments I made in the Implementation/Effectiveness Monitoring section above on the frequency of monitoring also apply to the Water Quality Compliance monitoring.

Sincerely,

Dennis Jackson
Hydrologist

References

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Table 1. Real-time precipitation stations suitable for THP water quality monitoring.

Real-Time Precipitation Stations

Excluding Stations Operated by the California Department of Forestry

Sorted North to South by River Basin

UPDATED: 03/21/2005

Station	ID	Elev	Lat.	Long.	County	Operating Agency
LOS GATOS CR (NEAR SAN JOSE)						
SAN JOSE (ALERT)	**SJE**	58	37.362	121.927	SANTA CLARA	Santa Clara County
SF BAY						
PALO ALTO 3E	**PAA**	7	37.439	122.107	SANTA CLARA	Santa Clara County
MT. UMUNHUM #2	**UMN**	3090	37.158	121.904	SANTA CLARA	Santa Clara County
SAN LORENZO R						
LAS CUMBRES	**LCM**	2760	37.208	122.063	SANTA CRUZ	Santa Cruz County
BOULDER CREEK	**BDC**	800	37.142	122.163	SANTA CRUZ	Santa Cruz County
SCHULTIES RD	**SCH**	1400	37.133	121.967	SANTA CRUZ	Santa Cruz County
BEN LOMOND	**BLN**	365	37.093	122.075	SANTA CRUZ	Santa Cruz County
OLIVE SPRINGS QUARRY	**OLV**	480	37.063	121.925	SANTA CRUZ	Santa Cruz County
SOQUEL CREEK	**SQL**	30	36.983	121.95	SANTA CRUZ	Santa Cruz County
SAN BENITO R						
MOUNT MADONNA	**MMD**	1822	37.011	121.702	SANTA CLARA	Santa Clara County
PAJARO R						
BURRELL STATION	**BRL**	1850	37.109	121.906	SANTA CRUZ	Santa Cruz County
EUREKA CANYON (CORRALITOS 6NW)	**EKN**	1700	37.036	121.803	SANTA CRUZ	Santa Cruz County
BROWNS VALLEY (CORRALITOS 4NW)	**BWV**	360	37.025	121.777	SANTA CRUZ	Santa Cruz County
PAJARO RIVER AT CHITTENDEN	**CHT**	82	36.902	121.605	SANTA CRUZ	USGS and DWR
SALINAS R						
SALINAS RIVER AT PASO ROBLES	**PAS**	700	36.628	120.686	SAN LUIS OB	USGS and DWR

Station	ID	Elev	Lat.	Long.	County	Operating Agency
FORT ORD #1	**FO1**	460	36.627	121.798	MONTEREY	US Army
FORT ORD #2	**FO2**	490	36.627	121.786	MONTEREY	US Army
FORT ORD	**FTD**	768	36.599	121.753	MONTEREY	US Forest Service
GLORIA GRADE	**GGR**	1960	36.532	121.277	MONTEREY	Monterey County
ARROYO SECO	**ARY**	980	36.23	121.488	MONTEREY	US Forest Service
MUSTANG RIDGE	**MTG**	2700	36.193	120.759	MONTEREY	Monterey County
SMITH MOUNTAIN	**SMI**	3920	36.083	120.608	MONTEREY	DWR/O & M
CASTLE MOUNTAIN	**CMT**	4000	35.942	120.328	FRESNO	DWR/O & M
SALINAS RIVER NEAR BRADLEY	**BRA**	443	35.93	120.868	MONTEREY	USGS and DWR
ESTRELLA RIVER NEAR ESTRELLA	**EST**	672	35.717	120.639	SAN LUIS OB	USGS and DWR
BLACK MOUNTAIN	**BLM**	3625	35.395	120.353	SAN LUIS OB	DWR/O & M
SANTA MARGARITA BOOSTER	**SMB**	1100	35.374	120.637	SAN LUIS OB	DWR/O & M
BRANCH MOUNTAIN	**BMO**	3770	35.189	120.083	SAN LUIS OB	US Forest Service
CARMEL R						
PONCIANO RIDGE	**PNR**	2610	36.4	121.723	MONTEREY	Monterey County
CHEWS RIDGE	**CHW**	5040	36.312	121.57	MONTEREY	Monterey County
VENTANA CONE	**VTC**	4750	36.3	121.714	MONTEREY	Monterey County
MONTEREY COAST						
POINT PINOS	**PPN**	55	36.518	121.931	MONTEREY	Monterey County
MINING RIDGE	**MNG**	4710	36.081	121.496	MONTEREY	Monterey County

Table 2. Real-time precipitation stations operated by the California Department of Forestry. These stations can not be used as stations to define water quality monitoring events since they are not maintained during the winter.

Real-Time Precipitation Stations

Operated by the California Department of Forestry

Sorted North to South by River Basin

UPDATED: 03/21/2005

Station	ID	Elev	Lat.	Long.	County	Operating Agency
LOS GATOS	**LSG**	646	37.2068	121.9428	SANTA CLARA	CA Dept of Forestry
LOS ALTOS HILLS	**LSA**	2001	37.3581	122.1472	SANTA CLARA	CA Dept of Forestry
SWEETWATER (CDF)	**SWW**	2150	37.397	121.485	SANTA CLARA	CA Dept of Forestry
LA HONDA	**LAH**	425	37.32	122.274	SAN MATEO	CA Dept of Forestry
BEN LOMOND (CDF)	**BLO**	2630	37.132	122.17	SANTA CRUZ	CA Dept of Forestry
CHALKS	**CKS**	1585	37.161	122.292	SANTA CRUZ	CA Dept of Forestry
CORRALITOS	**COR**	450	36.992	121.797	SANTA CRUZ	CA Dept of Forestry
PARKFIELD	**PKF**	1535	35.899	120.432	MONTEREY	CA Dept of Forestry
LAS TABLAS	**LTB**	900	35.657	120.922	SAN LUIS OBISPO	CA Dept of Forestry
LA PANZA	**LPZ**	1650	35.398	120.197	SAN LUIS OBISPO	CA Dept of Forestry
HASTINGS	**HTG**	1824	36.388	121.551	MONTEREY	CA Dept of Forestry
CAHOON	**CAH**	2230	36.358	121.542	MONTEREY	CA Dept of Forestry

Suggested Changes to the Monitoring and Reporting Program

TIMBER HARVEST ACTIVITIES
MONITORING AND REPORTING PROGRAM
~~Prepared January 20, 2005~~ Revised March 23, 2005

SECTION I

A. MINIMUM MONITORING - under this option, compliance with the California Department of Forestry and Fire Protection (CDF) Forest Practice Rules is required and CDF conducts Forest Practice Rules compliance monitoring. **During the initial two or three years required to field test the Eligibity Criteria and the Monitoring and Reporting Plan no THP will be assigned to the Minimum Monitoring tier. The total annual rainfall will determine if the field testing period requires two or three years. If one of the two years has total annual rainfall of less that 80% of the average annual rainfall an additional year of field testing shall be required.**

B. IMPLEMENTATION/EFFECTIVENESS MONITORING - used to determine whether activities are carried out as planned and are effective at achieving desired results.
Implementation Monitoring is used to determine whether activities are carried out as planned. Implementation Monitoring may be applied at a range of spatial scales, focusing on specific management measures or rate sets for multiple years. Examples of Implementation Monitoring include:

- Determine whether the discharger is properly applying and maintaining applicable Forest Practice Rules and specific prescriptions in a harvest plan, where the general conditional waiver or waste discharge requirements (WDRs) incorporates such requirements.
- Determine whether waiver conditions or WDRs are being properly met during the terms over which such waivers or WDRs apply.
- Inform development of waiver conditions or WDRs and adaptive management processes
- Implementation Monitoring is more informative when combined with Effectiveness ~~or~~ **and** Water Quality Compliance Monitoring.

Effectiveness Monitoring is used to determine whether particular land management prescriptions (e.g., erosion control measures, riparian buffers) are effective at achieving desired results. Effectiveness Monitoring may be applied at a range of spatial scales, focusing on specific management measures for multiple episodic events or multiple years. Examples of Hillslope Effectiveness Monitoring objectives include

- Determine whether measures applied during THP operations are resulting in the intended hillslope conditions.
- Determine whether applicable waiver conditions or WDRs are producing, on a programmatic scale, the hillslope conditions they were designed to produce.
- Inform development of waiver conditions or WDRs and adaptive management processes in order to improve the performance of prescribed measures.
- Examples of Instream Effectiveness Monitoring objectives include
  - Determine whether hillslope conditions created by timber operations are resulting in the intended instream conditions.
  - Given hillslope effectiveness monitoring data, determine whether waiver conditions or WDRs on a programmatic scale, are adequately protecting instream aquatic resources and meeting Basin Plan standards.
  - Given hillslope effectiveness monitoring data, determine whether certain conditions or measures are necessary to ensure water quality protection.
  - Inform development of waiver conditions or WDRs and adaptive management processes in order to minimize adverse impacts to aquatic resources and achieve compliance with Basin Plan standards.

Effectiveness Monitoring is most successful when instream and hillslope components are linked.

1. MONITORING POINTS

a. VISUAL MONITORING POINTS - Visual monitoring points shall include all roads, watercourse crossings, landings, skid trails, water diversions, **the upstream and downstream ends of all flowing watercourses on the THP,** all watercourse confluences, known landslides, and all mitigation sites in the timber harvest plan area. **Visual monitoring shall be done according to the standards adopted by the Regional Water Quality Control Board.**

b. PHOTO-POINT MONITORING POINTS - Photo-point monitoring points shall be at locations within the timber harvest plan area where timber harvest activities have the greatest risk of potential discharge (sites may be established during the pre-harvest inspection). Photo-point monitoring points shall include; **views looking** up and down stream **and cross stream at** ~~of~~ each ~~newly constructed or reconstructed Class I and Class II~~ watercourse crossing and landings within a Class I or II Watercourse or Lake Protection Zone (WLPZ). **Photo-point monitoring points shall also include other sites that have a risk of a potential discharge of sediment.**

The Discharger shall:

i. Utilize the attached document titled "Standard Operation Procedure 5.2.3 - Photo Documentation Procedure" (including my subsequent revisions to SOP 5.2.3) as the protocol for all photo-point monitoring (attached).

ii. Utilize flagging, rebar, or mother method of establishing the photo-point site locations.

iii. Utilize all photo-point locations until this Monitoring and Reporting Program is rescinded.

2. MONITORING CONSTITUENTS/FREQUENCY

a. **VISUAL MONITORING:** The Discharger shall monitor all visual monitoring points for existing or potential sources of erosion. The Discharger shall perform visual monitoring within 12 hours **to 24-hours after the end of** storm events ~~of two inches of rain of greater within a 24-hour period. If a storm terminates or two inches is reached between the hours of 3:00 pm (1500 hours) and 9:00 pm (2100 hours) visual monitoring shall occur within 18 hours~~ **as defined below.**

Year 1**, Year 2 and Possibly Year 3** - Monitoring shall occur a minimum of ~~three~~ **four** times **per year**. Year one monitoring will continue through the first winter after a timber harvest is completed. Year two monitoring begins one year after a timber harvest is completed. **If necessary, year three of monitoring begins two year after a timber harvest is completed. If less than 80% of the average annual rainfall occurs in either the first or second year of monitoring, a third year of monitoring shall be required.**

~~Monitoring Event One - The Discharger shall perform the first monitoring event within 12 hours of the first storm event that includes two inches of rain or greater within a 24-hour period.~~

~~Monitoring Events Two and Three - The Discharger shall perform the next two monitoring events within 12 hours of the next two storm events (one monitoring event each storm) that include two inches of rain or greater within a 24-hour period and soil saturation (i.e., soil saturation typically occurs after about four inches of accumulated precipitation during the wet season (the wet season begins October 15 of each year)).~~

The Discharger shall monitor the following storms each year that monitoring is required. The rainfall amounts shall be measured at the primary rainfall station selected by the RWQCB staff, during their review of the THP. Staff shall also select a backup rain gauge during the initial review.

- **Two (2) storms that produce more than 1.25 inches in a 24-hour period prior to December 24.**
- **Two (2) storms that produce more than 2.0 inches in a 24-hour period after December 24.**
- **All storms producing more than 4.0 inches in 24-hours.**

Years 3-5 - In the ~~second~~ **third or fourth** year of monitoring following completion of timber harvest operations and a determination that implemented management practices are functioning to protect water quality and beneficial uses, visual monitoring shall be consistent with a Road Management Program (Attached).

If implemented management practices are not adequately protecting water quality and beneficial uses, as determined by the Regional Board Executive Officer, **corrective action shall be taken and** ~~repeat year one~~ **the detailed visual** monitoring **required during the first year shall be repeated**.

Summary of Visual Monitoring frequency:

Year 1, **2 and possibly 3** a minimum of 4 events shall be monitored. ~~= 3 events (minimum)~~

Year 3, 4 and 5 - consistent with a Road Management Program.

If less than 80% of the average annual rainfall occurs in either the first or second year of monitoring, a third year of monitoring shall be required.

b. TURBIDITY MONITORING

During the initial two or three years required to field test the Eligibity Criteria and the Monitoring and Reporting Plan turbidity monitoring shall be required for all THPs. The total annual rainfall will determine if the field testing period requires two or three years. If one of the two years has total annual rainfall of less that 80% of the average annual rainfall an additional year of field testing shall be required. Turbidity monitoring points shall include;

- **upstream and downstream of all watercourse crossings;**
- **upstream and downstream of all water diversions,**
- **upstream and downstream of all roads, landings and skid trails within 50 feet of a watercourse;**
- **the upstream and downstream ends of all flowing watercourses on the THP,**
- **all watercourse confluences,**
- **upstream and downstream of all known landslides that terminate within 50 feet of a watercourse,**
- **upstream and downstream of all mitigation sites within 50 feet of a watercourse**

All in-stream water quality sampling must be done following a standardized procedure and a QA/QC plan that is approved by the Regional Board staff. For example, when sampling above and below a watercourse crossing, the downstream sample should be collected first to avoid contamination of the sample by walking on the streambed to collect the sample from above the crossing.

Turbidity grab samples should be collected in a wide mouth sample bottles with a volume of roughly 500 ml. The mouth of the sample bottle should not be submerged. Submerging the mouth of the sampling jar may result in re-circulation of stream water within the jar and skew the results. For safety at higher flows, the sample jar can be attached to a telescoping handle such as from a pole saw. Once the sample occupies about half the bottle it should be removed from the stream. The turbidity meter should be calibrated in the office. The turbidity meter sample cup should be filled from the sample bottle by fist closing the sample bottle and vigorously shaking it. A reading should then be taken. The procedure is repeated three or four times until the turbidity readings converge. The final reading is reported.

If there is more than a 5% increase in turbidity at the downstream sampling point compared to the upstream sampling point at a watercourse crossing Forensic Monitoring shall be initiated and the discharge shall be reported to the Regional Water Quality Control Board as per the Logging and

Reporting section. Once the Forensic Monitoring has located the source of the discharge, corrective action shall be taken.

c. **PHOTO-POINT MONITORING:** The Discharger shall monitor all photo-point monitoring points:

Year 1, **2 and possible 3**- Year one monitoring will continue through the first winter after a timber harvest is completed. Year two monitoring begins one year after a timber harvest is completed.

- Following completion of timber harvest activities (One Photo Set).
- Following the first ~~significant~~ storm event **that produces more than 2 inches of rain in a 24-hour period** (First Storm) (One Photo Set).
- **Following any storm that produces more than 4 inches of rain in a 24-hour period (One Photo Set).**
- **At the end of the rainy season, between April 15 and May 15 (One Photo Set).**
- ~~Following a significant storm event during the month of April (April Storm) (One Photo Set). A significant storm event means any storm with two inches of rain or greater within a 24-hour period and soil saturation (i.e., soil saturation typically occurs after a minimum of four inches of precipitation during after the start of the wet season (October 15)).~~

Additionally, The Discharger shall photograph new or reconstructed Class I and Class 11 water crossings:

- Before construction begins, after construction is completed, and after the crossing structure is removed (if crossing is temporary).

Photo-point monitoring shall occur prior to any corrective action and within seven days of all of the following:

1. Completion of timber harvest activities
2. The First Storm
3. **Any storm producing more than 4 inches in a 24-hour period.**
4. **At the end of the rainy season or prior to May 15.**
5. ~~April Storm events. If no significant storm event occurs in the month of April, the Discharger shall complete photo-point monitoring by April 30 of the same year.~~

If less than 80% of the average annual rainfall occurs in either the first or second year of monitoring, a third year of detailed photo monitoring shall be required.

Years 3, 4 ~~and~~ 5 - In years ~~two~~ **three, four** and five, following completion of timber harvest operations and a determination that implemented management practices are functioning to protect water quality and beneficial uses, the Discharger shall conduct ~~the April Storm~~ photo-point monitoring **between April 15 and after May 15**.

If implemented management practices are not adequately protecting water quality and beneficial uses, as determined by the Regional Board Executive Officer, **corrective action shall be taken and** ~~repeat year one~~ **the detailed photo** monitoring **required during the first year shall be repeated**.

Monitoring and Reporting Program
Summary of Photo Sets:

- Year 1, **2 and possibly 3** - 3 photo sets or 4, or more, photo sets if a storm producing more than 4 inches occurs at the designated rain gauge for the THP.

- Year ~~2~~ **3, 4 and 5** - 1 photo set or 2 photo sets, or more, if a storm producing more than 4 inches occurs at the designated rain gauge for the THP.

d. Required Actions: If the Discharger discovers a discharge the following actions will be taken:

- **Commence Forensic Monitoring to locate the source of the discharge.**
- **Report the discharge to the Regional Water Quality Control Board as described in the Data Logging and Reporting Section, if required.**
- **Take appropriate corrective action**

C. FORENSIC MONITORING - used to detect significant pollutant sources (e.g., failed management measures) in the field for purposes of timely remedial action.

Forensic Monitoring is typically applied at a sub-watershed or project scale, focusing specifically on stream conditions and sensitive receptors downstream of potential pollutant sources. Examples of Forensic Monitoring objectives include

- Locate sources of sediment production in a timely manner for rapid corrective action, where feasible and appropriate.
- Determine, where feasible, cause/effect relationships between hillslope activities, hydrologic triggers and instream conditions.

Forensic Monitoring is most successful when criteria such as storm events of particular size or instream sampling results are used to trigger field investigations allowing for timely detection and repair of controllable pollutant sources.

The Discharger shall perform visual monitoring of all roads, **the upstream and downstream end of all flow watercourses within the THP,** watercourse crossings, landings, skid trails, water diversions, all watercourse confluences and known landslides in the timber harvest plan area to detect failed management measures, failed implementation of management measures, or natural features that are contributing to observed water quality impacts.

- If at my time during implementation or effectiveness monitoring, a discharge is observed, the Discharger shall conduct forensic monitoring to identify failed management measures and/or source of discharge.
- If management measures fail (this includes failure to implement appropriate management measures), the Discharger shall photo document them **prior to taking corrective action** and management practices shall be implemented immediately to prevent discharge and impacts to water quality. **Physical corrective actions shall be photo documented after completion.**
- If timber activities cause a discharge (sediment, soil, other organic material, etc.) into waters of the state, the Discharger shall measure instream turbidity (using grab samples) in the closest ~~Class I or II~~ watercourse downstream of the discharge.
- If at any time during implementation or effectiveness monitoring, the Discharger observes a discharge, the Discharger shall notify the Regional Board within 24 hours **as described in the Data Logging and Reporting section and appropriate corrective action shall be taken.**
- The Discharger shall submit to the Regional Board a written report, including photo documentation, water quality data, and the management measures or corrective actions **taken** and a description of their effectiveness within 10 working days. Upon review of the report, the Regional Board Executive

Officer will determine completeness of the report and the need for additional actions necessary for the protection of water quality and beneficial uses.

Frequency: The frequency of Forensic Monitoring is coincident with implementation and effectiveness monitoring, or at anytime a failed management measure and/or discharge is reported or observed.

FORENSIC MONITORING AREAS OF CONCERN

The following areas need to be addressed during forensic monitoring if water diversion, feral pig activity, or trespass activity are leading to impacts to water quality.

WATER USEAGE: The Discharger shall monitor ~~the~~ **their own** water diversion point(s) for total daily water usage when water is being diverted. The Discharger shall monitor the creek to ensure no more than 10 % of the creek flow is diverted. **Streamflow shall be measured using standard methods such as employed by the US Geological Survey Water Resources Division.**

FERAL PIG ACTIVITY: During my inspection, the Discharger shall document all evidence of feral pig activity near watercourses that may be contributing discharges to waters of the state.

TRESPASS ACTIVITY: During my inspection, the Discharger shall document all evidence of trespass activity near watercourses that may be contributing discharges to waters of the state.

D. WATER QUALITY COMPLIANCE MONITORING - used to determine whether pollutant discharges from land use activities are in compliance with water quality standards.

Water Quality Compliance Monitoring is typically applied at a sub-watershed or project scale, focusing on the combined effects of a single project for some number of years greater than the active life of the project. Examples of Water Quality Compliance Monitoring objectives include

- Isolate and quantify pollutant discharges to waters of the State from timber harvesting and related activities.
- Determine whether discharges from timber harvesting and related activities meet Basin Plan water quality objectives, including objectives for temperature, turbidity and sediment.
- Determine whether discharges from timber harvesting and related activities meet applicable TMDL, waiver, or permitting requirements.

In most instances, it is necessary to collect pre-project data to make Water Quality Compliance Monitoring successful.

D.1 - Temperature - The Discharger shall monitor temperature continuously ("Hobo temps" **or equivalent equipment** shall be used for continuous temperature monitoring) in Class I **and Class II** watercourses (during the months of May through ~~November~~ **October 15**) upstream, near the upper extent of timber operations, and downstream, near the lower extent of timber operations. Temperature shall be monitored when timber harvest operations occur in Class I or II WLPZ.

Continuous water temperature recorders shall be placed in riffles or other locations where the water flow will be thoroughly mixed. Continuous water temperature recorders shall not be placed in pools. In addition, similar continuous temperature recorder will be placed in a shade location in the WLPZ to monitor air temperature.

All temperature recording equipment shall be operated according to a QA/QC plan that has been approved by the Regional Board staff.

~~If no Class I watercourse exists on the parcel where timber harvest activities occur, and there is water in the Class II during the months of May through November, temperature monitoring shall be conducted in the Class II watercourse when timber harvest operations occur in Class II watercourse.~~

Monitoring Frequency

Year 1 **through 5** - ~~Year one~~ Monitoring **shall be conducted from** ~~continue through the first~~ ~~winter~~ **May through October 15** after a timber harvest is completed. Year two monitoring begins one year after a timber harvest is completed.

Temperature - The Discharger shall monitor temperature during the months of May through ~~November~~ **October 15**

~~Years 2-5~~

~~Monitoring Frequency~~

~~Temperature - The Discharger shall monitor temperature during the months of May through November in year two and five following completion of timber harvest operations and a determination that implemented management practices are adequately protecting water quality and beneficial uses.~~

If implemented management practices are not adequately protecting water quality and beneficial uses, as determined by the Regional Board Executive Officer, **corrective action shall be taken and the** ~~repeat~~ year one monitoring **shall be repeated**. In addition to supplementary monitoring, the Regional Board Executive Officer will determine additional management measure implementation required to prevent temperature increases of more than 5^0F above natural receiving water temperature. **Additional management measure may need to be implemented if the water temperature data shows that the seven-day moving average of the daily maximum temperature exceeds 61.7 ^{0}F (16.5 ^{0}C) at any of the downstream water temperature monitoring stations.**

Summary of Temperature Data Sets:

Year 1through 5 - 1 data set **composed of a digital file for each continuous temperature recorder**.

~~Year 2 - 1 data set~~

~~Year 5 - 1 data set~~

D.2 Turbidity - The Discharger shall monitor all ~~newly constructed or reconstructed Class I and II~~ **watercourse** crossings within the timber harvest plan area in place after October 15th for turbidity (a hand held turbidimeter is acceptable for this purpose). Turbidity shall be measured approximately 25 feet upstream and downstream of all ~~newly constructed or reconstructed Class I and 11 road~~ **watercourse** crossings. **Turbidity shall also be monitored at the upstream and downstream end of all flowing watercourses within the THP.** Turbidity monitoring may be required as determined be the Regional Board Executive Officer if no newly constructed or reconstructed crossings exist within a proposed timber harvest plan and the plan has activity within a Class I or 11 WLPZ.

All in-stream water quality sampling must be done following a standardized procedure and a QA/QC plan that is approved by the Regional Board. For example, when sampling above and below a watercourse crossing, the downstream sample should be collected first to avoid contamination of the sample by walking on the streambed to collect the sample from above the crossing.

Turbidity grab samples should be collected in a wide mouth sample bottles with a volume of roughly 500 ml. The mouth of the sample bottle should not be submerged. Submerging the mouth of the sampling jar may result in re-circulation of stream water within the jar and skew the results. For safety at higher

flows, the sample jar can be attached to a telescoping handle such as from a pole saw. Once the sample occupies about half the bottle it should be removed from the stream. The turbidity meter should be calibrated in the office. The turbidity meter sample cup should be filled from the sample bottle by fist closing the sample bottle and vigorously shaking it. A reading should then be taken. The procedure is repeated three or four times until the turbidity readings converge. The final reading is reported.

Monitoring Frequency

Turbidity - The Discharger shall monitor turbidity within 12 hours **to 24 hours after the end** of all storm events **defined below** ~~with two inches or more of rain within a 24 hour period. If a storm terminates or two inches is reached between the hours of 3:00 pan (1500 hour) and 9:00 pan (2100 hour) turbidity monitoring shall occur within 18 hours~~.

The Discharger shall monitor the following storms each year that monitoring is required. The rainfall amounts shall be measured at the primary rainfall station selected by the RWQCB staff, during their review of the THP. Staff shall also select a backup rain gauge during the initial review.

Year 1**, Year 2 and Possibly Year 3** - Monitoring shall occur a minimum of ~~three~~ **four** times **per year**. Year one monitoring will continue through the first winter after a timber harvest is completed. Year two monitoring begins one year after a timber harvest is completed. **If necessary, year three of monitoring begins two year after a timber harvest is completed. If less than 80% of the average annual rainfall occurs in either the first or second year of monitoring, a third year of monitoring shall be required.**

- **Two (2) storms that produce more than 1.25 inches in a 24-hour period prior to December 24.**
- **Two (2) storms that produce more than 2.0 inches in a 24-hour period after December 24.**
- **All storms producing more than 4.0 inches in 24-hours.**

~~Monitoring Event One - The Discharger shall perform the first monitoring event within 12 hours of the first storm event that includes two inches of rain or greater within a 24 hour period.~~

~~Monitoring Events Two and Three - The Discharger shall perform the next two monitoring events within 12 hours of the next two storm events (one monitoring event each station that include two inches of rain or greater within a 24 hour period and soil saturation (i.e., soil saturation typically occurs after about four inches of precipitation during after the slut of the wet season (October 15)).~~

Years 3 **through** 5 - In the ~~second~~ **third or fourth** year of monitoring following completion of timber harvest operations and a determination by the Regional Board Executive Officer, that implemented management practices are adequately protecting water quality and beneficial uses, the Discharger shall conduct turbidity monitoring based on need as determined by level C (forensic) monitoring.

If implemented management practices are not adequately protecting water quality and beneficial uses, as determined by the Regional Board Executive Officer, **corrective action shall be taken and the** ~~repeat~~ year one monitoring **shall be repeated**.

Summary of Turbidity Data Sets:

Year 1, **Year 2 and possibly Year 3** - 1 data set (minimum of ~~three~~ **four** events)

Year **3 through** 5 - as needed

SECTION II

DATA LOGGING AND REPORTING

a. LOGBOOKS The Discharger shall maintain logbooks for recording all visual and water analysis data. These logbooks shall be available for inspection to the Regional Board staff.

b. SEDIMENT RELEASE REPORTING Whenever at least one cubic yard of soil is released to a waterway due to anthropogenic causes or at least five cubic yards of soil is released to a waterway due to natural causes, or when turbidity is 5% greater downstream compared to upstream (of a crossing or the Plan area), then the Discharger shall report this event to the Regional Board within ~~48~~ **24** hours. The Discharger shall submit a written report to the Regional Board within 10 days of detection. The Discharger shall investigate source areas of sediment. If sources are found, the Discharger will locate and document the source and size of the release. If sources related to timber harvest activities are found, the Discharger shall immediately correct the source if possible, or schedule corrective action at an appropriate time given the site conditions present.

c. ROAD INVENTORY PROGRAM The Discharger shall implement a Roads Management Program (similar to the Big Creek Lumber Company's "Protocol for Conducting Company Road Inventories & Maintenance" (See Attached May 23, 2001 document)) within the THP area. After each storm event that triggers an inspection, the Discharger shall perform a field inspection and prepare a field form as described in the Protocol. The Discharger shall enter the data into a logbook (same as described in item a. above) and database or spreadsheet which tracks observations, work completed, and dates of last review. If the need for repair is immediate, the Discharger shall promptly develop an appropriate treatment so that the Discharger can complete corrective action as soon as practical.

d. VIOLATION REPORTING: The Discharger shall report any violation of the Forest Practice Rules related to water quality, to the Regional Board within ~~48~~ **24** hours. The Discharger shall provide the report in writing to the Regional Board within 10 working days of the violation. The written report shall include photo documentation and water quality data before and after remedial action. Upon review of the report, the Regional Board Executive Officer will determine completeness of the report and the need for additional actions necessary for the protection of water quality and beneficial uses.

e. ANNUAL REPORT: By ~~November~~ **July** 15 of each year, The Discharger shall submit an Annual Report to the Regional Board that addresses the following:

i. A status of active timber harvest operations

Previous year activities, wet weather problems observed, etc.

Planned activities

ii. A summary of all violations **and corrective actions.**

iii. Summary of the water quality monitoring performed during the previous year including submittal of data and photos in electronic format.

iv. With the first annual report, submit a copy of the road management program

v. A summary of the road management program' and actions implemented for the protection of water quality and beneficial uses.

vi. Recommendations for improving the monitoring and reporting program

f. The Discharger is responsible for ensuring that all monitoring is done in a safe manner. If my monitoring point is too dangerous to sample, then the Discharger shall report this circumstance to the Regional Board within 48 hours.

g. The Regional Board Executive Officer may modify or rescind this Monitoring and Reporting Program at my time, or may modify or rescind the monitoring and reporting program as to a specific discharger.

MONITORING PROGRAM REVIEW AND UPDATE

Data collected will be evaluated after 24 months (two summer and two winter seasons shall be evaluated) to determine the need for monitoring program modification. **If less than 80% of the average annual rainfall occurs in either the first or second year of monitoring, a third year of detailed photo monitoring shall be required.**

Ordered By:

Roger W. Briggs, Executive Officer

Date

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'Big Creek's Road Inventory Program be used as am model