

The following are Jesse Noel's comments in their entirety excerpted from a series of emails he sent as his formal public comments. Where he sent more than one email on any day the emails are numbered in the order sent:

March 20, 2019

Email #1:

If you know the answers to any of these questions, please inform us.

What is the trigger basal area for a cut in Elk River Watershed?

Is it still 125 ft. b.a.? What will the trigger be under the new prescriptions?

What range of stems do they have? How much does a green wet soaked pecker poles size tree weigh in the rain? How much does a small redwood, say 36" diameter, weight soaking wet in the rain?

Up to how many stems per acre do they fall?

Email #2

As I understand you are an engineering geologist who evaluates impacts to water quality. I also understand that proper fulfillment of your duties requires an outcome assuring attainment of full protection of public health and safety. That means a margin of safety!

The questions I asked and information I requested are essential to my evaluation of the impact to water quality and public safety. I expect a full engineering evaluation of mitigations to impacts; this includes an assessment of the impacts to water quality resulting from minimum standards of CAL FIRE rules. Cut the forest rules are not necessarily protective water quality or public safety---you must evaluate the impacts.

Years ago, I was standing in an opening in the forest after a night of rain when a 3' to 5' fir snag fell about 300' from me. I watched a ripple type wave move across the meadow toward me and then felt the earth quake under my feet.

I am certain that felling trees in winter can have enormous impacts on soil pipes and derangement of hydrology as the impact of tons of logs, free falling 30 or 70 feet, smash the wet soil mantle---the impact pressure can locally liquify the mantle like an earthquake does. Multiply this by dozens or scores of impacts per acre and you might begin to evaluate the manifesting geological impact. Then add the factor of harvest reentry every 20 years compared with once in 60 years or a hundred years. Then add the factor of live root size and live root volumes. Multiply all those factors together. Do the minimums of the FPRs attain sufficient mitigation to protect and restore public safety?

How many more decades must residents lives be imperiled?

March 22, 2019

Email #1:

The WDR must accommodate the continued existence and breeding success of *Margaritafera sulcata*.....a species that is dependent upon salmonids gills for successful transport of larvae to their rearing habitat. *Sulcata* is not a HCP listed species but is an aquatic receptor. The WDR must address and

assure sulcata's survival before accommodating important economic development needs of the discharger, no? It seems that NCRWQCB has a policy of not adopting mitigations that are deemed infeasible or impracticable by the dischargers. Doesn't this policy or pattern rely on the forestry exemption for its validity? I think there is an exclusion from application of the forestry exemption where species are threatened, endangered, or imperiled.....and where existing uses of water are destroyed or flooding is created or increased. While sulcata is not listed, it is imperiled because its life cycle in Elk River depends on the success of a dwindling listed species. Please explain with specificity whether the NCRWQCB's refusal to require effective mitigations of immediate impacts stems from reliance on the 404 f 1 a exemption in any manner----or whether the refusal or failure to mitigate sources from an underground policy or regulation.

My concern extends to or encompasses the questionable legality of using the CWA and APA and CEQA process to authorize harm to imperiled species----

Email #2:

I forgot to mention that Margaritifera sulcata is cited in the literature to be a longlived species that filters many things including pathogens out of the waters of the United States (in Elk River). I have found the remains of freshwater mussels near my property on the South Fork Elk years ago. I was heartened to find them, and look for them in the river. I don't find any reference in the literature that disposes of the issue of mutual symbiotic reliance between salmonids and sulcata for breeding success and rearing success. If this issue has been addressed in the past, and in the WDR and TMDL please inform me.

April 2, 2019

Hi,

I am wading into the cross walk between the Tech Report, TMDL, BPA Action Plan and the WDR and nonstructural liability. Please help me understand.

I am particularly concerned that the discretion exercised (in approval of these regulatory actions) did not, does not, or cannot achieve a sufficient margin of safety---both in terms of avoiding trespass type physical invasion and imperilment of people living in or visiting Elk River. Potentially unjustifiable acts of discretion extend back to 1991 when WQ inspector Andrew Baker put CDF and WQ on notice that cumulative effects had begun resulting in delivery of massive amounts of sediment and aggradation in Elk River.

While WQ holds that the Action Plan regulatory actions are intended to accommodate important economic development of timber, the California Civil Code was designed to eliminate financial incentives for trespass by eradicating the benefit associated with the wrongful use of another's land. WQ seems to violate the Legislative intent by proposing the use of taxpayer money to cleanup timber polluters' pollution---pollution that is causing wrongful use of residents' land as well as creating an obstruction on the bed and lower banks of the river held in reserve upon statehood. Please explain how WQ's discretionary regulatory acts to accommodate further pollution by timber can properly attain Legislative Intent.

As you know, the cross-section at station 510 has been buried by at least 1 meter of bed aggradation as of last summer when I sent you photographs and also unquantified aggradation on the Mainstem Elk and North Fork Elk. I believe that your WDR permits a 10% increase in flows. Please disclose what the peak flow increase and cross-sectional area was in 1986 and/or 1976 when the clean water act high quality water thresholds were set---so that we can see the true increase in flow and imperilment of residents and damage to property that this regulatory policy imposes.

Since the bed at station 510 is about 5 meters or 17 feet wide, this equates to a loss of about 200 cubic feet per second conveyance when the velocity is 4 ft. per second. This is new information that neither the Action Plan nor the WDR accounts for---to my knowledge. Further loss in conveyance results from this seasons' 4" deposits on the banks and terraces. This loss of conveyance reasonably means that the WDR needs to order a reduction in flows, not a 10% increase.

I have yet to see predicted 25 year, 50 year, and 100 year flood elevations at each of the imperiled homes as a function of ongoing aggradation at cross-sections as is reasonably necessary. Please update the cross-section inputs before running the prediction. Please relate the degree of care exercised to the degree of risk, act reasonably in light of the evolving state of the art in flood loss reduction and advances in technology, exceed the norms in designing, implementing, monitoring, mitigation, enforcement, and contingency funding requirements. Subject decisions to economic costs, risks, and other factors in formulating the TMDL and necessary amendments to the Action Plan.

To reduce potential regulatory liability further please provide performance standard approaches, consider the impacts of permitting decisions on adjacent landowners including cumulative impacts of such decisions, and apply a no adverse impact standard that relates back to the 1986 FEMA and 1976 CWA thresholds. Adhere to the Clean Water Act Congressional Record with regards to the exception to the 404 f 1 a exemption that applies where forestry activity has demonstrated destruction of existing uses of water, creates flooding or harms ESA listed species or threatened species. This exception was considered a necessary limitation to the exemption to avoid imperilment of people. Please make this exception/ limitation part of the Basin Plan---to eliminate the use of the weasel words "feasible" or "practicable" to limit the control of pollution in situations where use of water is destroyed or flooding caused.

It seems the necessary margin of safety can best be attained by issuing a moratorium rather than a permit. Both Jack Lewis and Leslie Reid have opined that if harvest stops forest recovery will in a matter of decades control sediment delivery to natural background rates. Table 7 also supports this contention. Letting the forest recover will also have a negative carbon footprint---something that should be considered before any discretionary decision is made.

NCRWQCB held that accommodating timber despite its pollution is proper without considering other alternatives such as whether public ownership of the watershed's forest would be cheaper in the long run to the taxpayers than having timber operations continue. Reveal whether past exercises of discretion considered such an alternative---and reveal the economics of such a plan, including all benefits that would be in the maximum benefit of the majority of Californians.

Please also consider the California Constitution with regards to the imperilment which residents face as a result of past acts by NCRWQCB---could it be that these past acts were in excess of NCRWQCB's authority to exercise discretion and perhaps they should be revoked? Secondly, with regards to the stringent pollution controls and fines on cannabis, does the Constituion require that timber be subjected to the same pollution controls and fines? :

## CALIFORNIA CONSTITUTION

### ARTICLE 1 DECLARATION OF RIGHTS

SECTION 1. All people are by nature free and independent and have inalienable rights. Among these are enjoying and defending life and liberty, acquiring, possessing, and protecting property, and pursuing and obtaining safety, happiness, and privacy.

SEC. 7. (a) A person may not be deprived of life, liberty, or property without due process of law or denied equal protection of the laws;

(b) A citizen or class of citizens may not be granted privileges or immunities not granted on the same terms to all citizens. Privileges or immunities granted by the Legislature may be altered or revoked.

SEC. 19. Private property may be taken or damaged for public use only when just compensation, ascertained by a jury unless waived, has first been paid to, or into court for, the owner. The Legislature may provide for possession by the condemnor following commencement of eminent domain proceedings upon deposit in court and prompt release to the owner of money determined by the court to be the probable amount of just compensation.

SEC. 26. The provisions of this Constitution are mandatory and prohibitory, unless by express words they are declared to be otherwise.

sincerely,

Jesse Noell

April 5, 2019

Thanks for the clarification notes.....Yes, where is the finding re WDR attains TMDL margin of safety?

April 14, 2019

Email #1:

To whom it may concern,

To the extent that the purpose of the WDR is to prescribe maximum mitigation of controllable sediment discharge from logging activity it would seem appropriate to use the best available science and the most enforceable methods in the prescriptions.

Leaf Area Index, or LAI, is one method to estimate the potential surface area that can intercept rainfall. Canopy cover is another. A study of a redwood plantation planted in 1982 in Scotia, California chose LAI as the best surrogate to estimate tree volume and basal area growth of different silvicultural treatments. Leaf area and tree age is also known to be related to root strength. Root strength is known to be an important factor in soil shear strength. Leaf area index is known to correlate much better to rainfall interception than canopy cover.

/PTD/OHara-Berrill2010\_Article\_DynamicsOfCoastRedwoodSproutCl.pdf

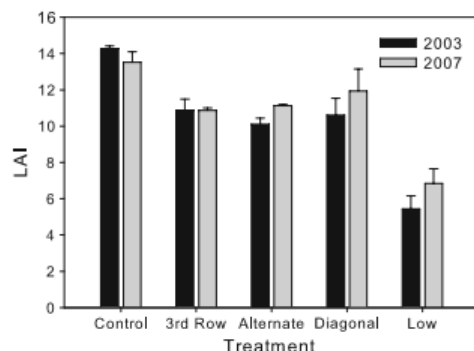
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datasets that applies to thin  
25 years old (Fig. 2).

## Results

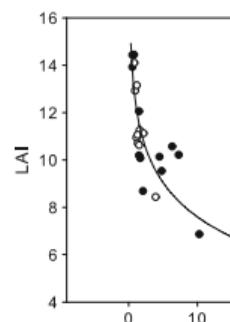
Stand LAI in 2003 and 2007 remained at similar levels in the control and third row treatments but tended to increase during the 4-year period in the more heavily thinned treatments (Fig. 1). However, only the alternate row treatment had a significant increase in 2007 ( $P = 0.032$ ) because of the loss of one diagonal row plot and high variance in the low density treatment. In 2007, 25 years after planting and 10 years after thinning, no significant differences in overstory cohort LAI were observed except in the low density plots, where LAI was significantly lower than for all other treatments. In 2003, LAI for the control treatment was significantly greater and that for the low

Logistic regression model of the tallest tree survival of the tallest tree importance of light to tree survival approached 100% declined rapidly at lower probability of survival was approximately 5.9% and a 1 achieved with a  $PACL_{2003}$

The growth of surviving sensitivity to light levels.  $PACL_{2007}$  to represent average Height growth of surviving sprouts sampled for growth



**Fig. 1** Mean LAI for each treatment in 2003 and 2007 with one standard error. Means are based on three plots each in 2003, three plots in the third row, alternate, and low treatments in 2007, and two plots in the control and diagonal treatments



**Fig. 2** Relationship between LAI in 2003 and 2007 data. Model was of the form  $y = a \cdot (PACL \times 10)^{-b}$ , (adj.  $R^2 = 0.8$ ,  $n = 24$ )

Since HRC proposes to use the selection harvest method to reduce forest basal area at 20 year re-entry to the minimum retention requirement of the FPRs, Fig. 1 above is quite relevant. The minimum basal area retention level in the WDR is much lower than that of the "Low" treatment area depicted in Fig. 1. I raised this issue at our phone conference and you peremptorily dismissed it as if it were whimsical and deserving no consideration, evaluation, or risk analysis in conjunction with soil shear strength, peak flow, channel extension, pore pressure, or a determination of the maximum potential mitigation of sediment discharge that is feasible. Given that the residents living downstream are severely imperiled by frequent flooding due to river channels that are severely obstructed by sediment from recent logging, it seems like residents' lives are being being subjected to willful increases in risk. Protection of public health and safety seems like it should be the highest priority of someone with your job description.

Root biomass at a 30 some year old plantation in Scotia:

[digitalassets.lib.berkeley.edu/etd/ucb/text/Caldwell\\_berkeley\\_0028E\\_14145.pdf](https://digitalassets.lib.berkeley.edu/etd/ucb/text/Caldwell_berkeley_0028E_14145.pdf)

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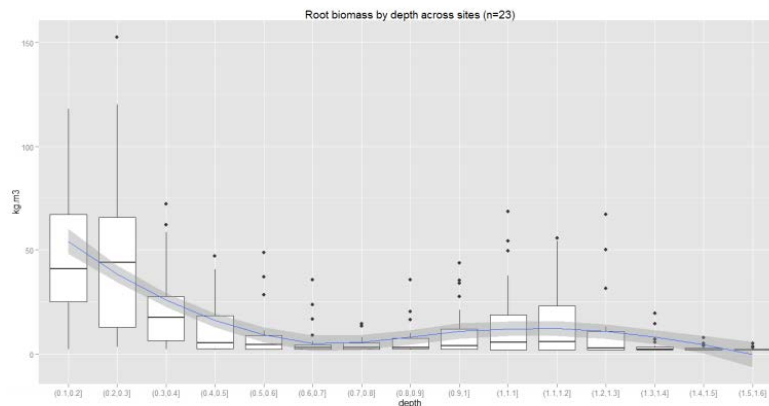


Figure 23: Root biomass by depth, as determined from GPR reflectance across plots. Biomass is estimated from the regression presented in Figure 9, and divided into 10 cm bins.

More on root strength from PSW U.S.F.S Research Station:

of a section of bank along the Moscow River in the Soviet Union were evaluated. The size and number of roots protruding from the wall of the collapsed soil block were measured. The tensile strength of linden roots was determined in the laboratory. The total force required to break the soil mass reinforced by linden roots was calculated to be about 137 metric tons, of which 130 tons were required to break the roots and 7 tons to tear the sandy loam soil mass from the bank. Breaking the linden roots took 95% of the total force, although the total cross-sectional area of all the roots constituted less than half a percent of the wall area of the collapse.

It has been calculated that the root network accounted for 71% of the shear strength at saturation of glacial till soils on 35° slopes in British Columbia. It was observed in Sweden that an imposed load may be 70% greater before soil rupture in soils with a root network than in soils without roots.

Slope stability problems will likely develop as the tree root system decays after timber cutting on steep slopes where the predominant strength is contributed by the binding action of the roots. As the root system decays following deforestation, the relative reinforcement by the roots will decline (Fig. 1). Within 2 years after deforestation, about 50% of the original root reinforcement is lost and 90% is gone within 9 years.

The rate of strength loss varies according to species, root size, and the activity of decay organisms. Small roots decay most rapidly, while large decay-resistant roots may remain in the soil for decades. For example, intact roots have been found greater than 15 cm in diameter from western redcedar trees which had been cut 50 years earlier. However, redcedar roots 1 cm in diameter had lost about 50% of their tensile strength within 5 years of cutting. Douglas-fir roots decay more rapidly than redcedar roots, and the rate of decay is related to geographic location. The strength of 1-cm-diameter Douglas-fir roots decreased by about 50% within 3 years after cutting in coastal British Columbia. It was found that 50% of the Douglas-fir

erated forest. Net reinforcement is the sum of reinforcement by the regenerated forest.

roots 1 cm in diameter decayed within 1 1/2 years in the Rocky Mountains, and the same proportion was gone within 1 year in coastal Oregon. About 90% of the Rocky Mountain roots decayed in 12 years, whereas 90% of the Oregon roots were gone in less than 5 years.

As vegetation reoccupies the deforested area, new roots begin to progressively reinforce the soil. For example, in Fig. 1, about 14 years are required until the new forest provides 50% of the root reinforcement supplied by the original forest before cutting, and 23 years until the soil in the deforested area returns to the strength of that in the uncut forest. The actual rate of soil strength recovery can vary, and depends on many more environmental variables than does the rate of strength loss through decay. In severe sites the recovery of root reinforcement can be lengthy. In logged mixed conifer forests in northwestern California, calculated root reinforcement in areas logged 25 years earlier was only about 40% of that in adjacent uncut areas.

The net reinforcement of the soil by roots is the sum of the reinforcement by residual decaying roots of the cut trees and the reinforcement by new roots of the regenerating forest. In Fig. 1 the net reinforcement in a promptly regenerated forest reaches a minimum about 9 years after deforestation. Net reinforcement then is about 20% of that in the uncut forest. It becomes greater after 9 years, as the roots of the new forest continue to develop in the cut areas.

If regeneration is delayed by 5 years, decay of the residual root system of the cut forest will continue for 5 years before the new root system begins to add strength. The net soil reinforcement will then reach a minimum which is substantially lower than in areas where regeneration is prompt. The minimum net reinforcement with a 5-year delay in revegetation occurs 12 years after logging, and is only about 7% of that in the uncut forest.

The following from U.C. Berkeley researchers shows how the minimum WDR canopy retention prescription provides minimum basal area retention over the 20 year re-entry period.

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Figure 2—Change in DBH through time by species, PCT, redwood and Douglas fir, and PCT treatment (TPA retained: 100, 150, 200, 250, 300 and unthinned control).

## Basal Area

The 1981 PCT reduced TPA and BA in thinned plots (fig. 3). After PCT, BA development proceeded at slightly different rates, presumably as a consequence of differences in tree size, vigor, and site quality. The unthinned control and 100 TPA treatments showed relatively slow BA development, and

270

*Proceedings of the Coast Redwood Science Symposium—2016*

the 250 TPA treatment had more rapid BA development relative to the other treatments. Thinning did not result in significantly different BA at age 49 among the three replicate blocks where each PCT treatment was repeated.

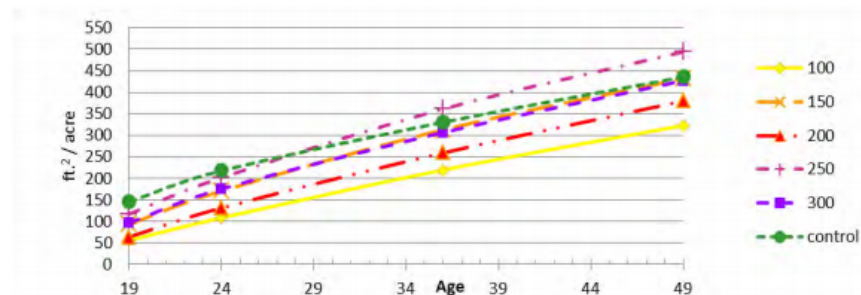


Figure 3—Average basal area (BA) over time by 1981 PCT treatment TPA retention levels.

How many stems of what age class does the WDR require to be retained and to what extent will this prescription attain the recovery depicted in the pie charts in the tech report ---these are the pie charts for the years 1955 to 1987 when the harvest was 0.2% per year and the watershed was largely cloaked with 40 to 80 year old forest? How can the WDR possibly attain recovery (via 20 year re-entry selection) of the existing beneficial uses of water and eliminate the nuisance and trespass imperilment to residents lives?

PSW research Ziemer found that root reinforcement in forests in NorthWestern California logged 25 years earlier had recovered about 40% that of uncut areas nearby.

Based on the above, your mitigations seem whimsical----they don't add up---they demonstrate that nuisance and trespass imperilment will be maintained and increased.

Email #2:

Photos of canopy in Elk River are attached to go with my comments.



these photos are taken with an old 20mm film lens on a dx format camera so the coverage is about like a 30mm lens

0093 is taken standing standing in steep selection harvest looking up, 94, 95 are looking up slope.

0096 is taken in nearby un harvested canopy

By the way, sediment has started to infill and impair No Name Gulch creek similar to recent impairment of Clapp Gulch.









April 15, 2019

I received today the updated or relevant findings; here are comments paragraph by paragraph---

1) "HRC manages.... in a manner... that will lead to compliance" : CEQA compliance requires that (further) no activity be approved until significant adverse cumulative impacts are avoided or mitigated; Civil Code 3334 was intended by the Legislature to eradicate all benefits obtained by trespass---yet here the Water Board, an appointed Agency, interprets CEQA and Porter-Cologne in a manner that authorizes flood water invasion type trespass and nuisance prohibited by the Civil Code, as well as imperilment of lives and livelihoods prohibited by Constitutional Rights and inalienable rights. The CDF neg dec that the WDR tiers off of improperly ignores the limitation and requirement of the FPA that "it is not the intent of the Legislature by enactment of this Chapter to take private property without due process and just compensation in violation of State and Federal Constitutions". Certainly, there is no mention by Section 4512 (d) that the Legislature intended the Director of CDF to place residents lives in peril---or lives could be placed in peril for as long as needed to implement the TMDL----"if not feasibly eliminated, minimized, as soon as feasible to implement the TMDL zero load allocation".

6) "most recent period of increased disturbance, which peaked from the mid-1980s to 1998 and has gradually diminished through" the bankruptcy then gradually increased back to 2% per year as political pressure was placed upon the water board members would be closer to the truth; also the Board's predatory delay--refusing to issue a Cease and Desist Order-- knowingly placed residents in increasing peril.

8) Identification of the declaration of nuisance (circa Jan. 21, 1998 or Dec. 1997) and the moratorium is an essential part of history---and the declaration remains in effect. This effect is also identified by CDF to be adverse and cumulative---which means that the unabated nuisance is evidence of ongoing violation of Porter-Cologne, CEQA, CWA, and FPA---as well as intentional, deliberate, purposeful denial of residents' inalienable and constitutional rights. Furthermore, the obstruction of sediment on the bed of the State creates trespass by flood flow that places lives in peril.

12) "Regional Water Board, California Department of Fish and Wildlife (CDFW), California Geologic Survey (CGS), and other agencies are responsible agencies charged with the multidisciplinary review of THPs to ensure compliance with applicable state laws---but they have enabled violation of CEQA, FPA, Porter-Cologne, CWA, Civil Code 3334 and constitutional rights---this 17 years of failure to ensure is highly relevant to CEQA cumulative effect analysis and the WDR--the process is broken!

13) "The FPRs include rules for protection of the beneficial uses of water" but the record evidences that these rules are not effective in Elk River

14) The evidence shows that the HCP is not effective in Elk River

19) The TMDL Action Plan permits continuing violation of Porter-Cologne, CWA, Civil Code 3334, Constitutional Rights, and permits ultra-hazardous activity to place residents lives in peril. Since FPA, CEQA, CWA, and Porter-Cologne have failed to eliminate the nuisance and trespass for 17 years--- it is time for government to take the forest by eminent domain and let the watershed recover. HRC has demonstrated that it cannot and will not act responsibly. The 10 to 50 million dollar price that it might cost to condemn the forest land is far less than what the public would pay to dig the big timber trash ditch.

51115.5. (a) Notwithstanding any other provision of law, timber operations conducted within a timber production zone pursuant to the provisions of the Z'berg-Nejedly Forest Practice Act of 1973 (Chapter 8 (commencing with Section 4511) of Division 4 of the Public Resources Code) shall not constitute a nuisance, private or public.

(b) This section is not applicable with respect to any timber operation which (1) endangers public health or public safety or (2) prohibits the free passage or use of any navigable lake, river, bay, stream, canal, or basin, or any public park, street, or highway.

22) "Water quality indicators and associated numeric targets outlined in the TMDL are not independently enforceable" but they must be made enforceable to harmonize with other laws. Senator Edmund Muskie during the debate *quoted by Avoyelles*, 715 F.2d at 903.

*Id.* at 925. For the text of the CWA farming exemption, *see supra* note 6.

*Avoyelles*, 715 F.2d at 925.

*Id.* at 926.

*Id.* The court quoted Senator Edmund Muskie during the debate on the 1977 Amendments: New subsection 404(f) provides that Federal permits will not be required for those narrowly defined activities that cause little or no adverse effects either individually or cumulatively. While it is understood that some of these activities may necessarily result in incidental filling and minor harm to aquatic resources, the exemptions do not apply to discharges that convert extensive areas of water into dry land or impede circulation or reduce the reach or size of the water body. *Id.* (quoting 123 CONGO REC. 38,997 (1977), reprinted in 3 LEGISLATIVE HISTORY at 474 (cited in note 61)).

25) "Phase 1 of the Upper Elk River Sediment TMDL Implementation Plan requires control of all existing and potential future sediment sources in the upper watershed while the Elk River Recovery Assessment is completed and the Elk River Watershed Stewardship Program is developed, initiated, and successfully results in the activities necessary to expand the sediment loading capacity of the impacted reaches and abate nuisance conditions." This a fantasy---far less that 5% of the necessary money is allocated for expansion of the waste ditch---and by the required CEQA definition of feasible---HrC's past acts provide overwhelming evidence that control is both infeasible and a fantasy.

27) "the WDRs and any other orders for the two major landowners will also contain any additional specific provisions to ensure that all anthropogenic discharges of sediment are minimized and eliminated to the extent feasible and, if not feasibly eliminated, minimized, as soon as feasible but not later than 2031"---this is illusory, unenforceable, and deceptively suggests that none of our laws need to be enforced and that it is legally proper to place and hold residents in peril on a whim.

29) No timelines, mileposts or benchmarks, or enforceability plus no crosswalk with evidence how much root strength will increase, soil shear strength will increase, rainfall interception will decrease, channel extension will reduce/ recover, pore pressure will decline; on what portion of the area, over what period of time, and what the lag time until the infilled channel recovers = a deceptive conjob

30) "The findings below describe reasonable waste discharge.....This increases the need to further constrain any additional sediment inputs that are controllable in order to make Waste Discharge Requirements - 12 - June 19, 2019 DRAFT Order No. R1-2019-0021 progress toward attainment of the load allocation and protection of beneficial uses". ----This appears to admit that the mitigations are not sufficient----and therefore do not meet CEQA or Porter-Cologne--

35) "These impacts can be reduced or prevented by limiting the intensity and rate of canopy removal through silvicultural prescriptions designed to protect riparian zone function and limit hydrologic changes related to upslope canopy removal." ----Since you know impacts can be reduced; how much reduction would result from no harvest over what periods of time?

36) "These impacts can be reduced or prevented by limiting the intensity and rate of canopy removal through silvicultural prescriptions designed to protect riparian zone function and limit hydrologic changes related to upslope canopy removal." ----What period of time is required for recovery from nuisance conditions and trespass of residents' property if no harvest occurred or if the 0.2% rate that was feasible between 1955 and 1987 occurred? Why is what was feasible then not feasible now? Why is it feasible to create and maintain life threatening flooding of residents under CEQA, FPA, Porter Cologne, CWA for 30 years---1997 to 2031, but not 0.2% rate that was feasible last century?

37) "Partial harvesting results in post-harvest conditions that are less susceptible to mass wasting and increased erosional processes as compared to clearcut harvesting." ---Are you certain this continues to be true after summing up 2 or 6 harvest re-entry impacts--- Please analyze this and prepare a graphic comparison, because this is not what the studies that I sent you show. Low stocking and 20 year re-entry = lower root strength, shallower root strength, higher through fall rain, higher pore pressure more often, greater ground disturbance ----how do you explain the recovery depicted in the pie chart that occurred 1955-87? True, trees grew faster back in the 2nd growth era, channels hadn't extended as much, residual roots were much larger and deeper, ground wasn't as compacted, etc.

38) "average overlapping crown canopy for each five-year period"----why not use the appropriate metric which is leaf area index? canopy = deceptive conjob

39) "These rates are lower than required under the 2006 WWDRs" ---these were not effective and harvest rates were low during the prior decade of moratorium and bankruptcy

Sorry, I'm out of time----

Sincerely,

Jesse Noell