Construction General Permit – Stormwater
Deadline: 5/4/07 5pm

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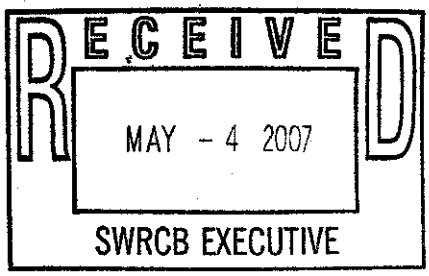

Ms. Tam Doduc, Chair
Mr. Gary Wolff, Vice-Chair
Mr. Arthur Baggett, Member
Mr. Charles Hoppin, Member
Ms. Frances Spivy-Weber, Member
Ms. Dorothy Rice, Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Sent via Electronic Mail to commentletters@waterboards.ca.gov

Re: Comments on the Preliminary Draft of NPDES General Permit for Discharges of Storm Water Associated with Construction Activities

Dear Ms. Doduc, Members of the Board, and Staff:

On behalf of the California Coastkeeper Alliance, I am pleased to present the following comments prepared after I reviewed the Preliminary Draft of the General NPDES Permit for Construction Activities and the associated Fact Sheet distributed on DATE ("Draft Permit"). Overall, the Draft Permit is a substantial improvement over the General NPDES Permit for Construction Activities currently in effect. As explained below, many of the additions, changes, and modifications in the Draft Permit will help the State Water Resources Control Board ("State Board") meet its mandate of protecting water quality throughout California. Nonetheless, there are also several components of the Draft Permit that need strengthening. These comments explain how the Draft Permit could be improved to achieve the desired result. I have also included a summary of my qualifications and experience to perform the review following the comments on the substantive provisions of the Draft Permit.

COMMENTS AND RECOMMENDATIONS

Organization

For clarity and ease of reference, these comments and recommendations are usually, but not always, arranged in the same order as the Draft Permit and reference the Draft Permit sections using **bold font**, as follows: **I.** FINDINGS; **II.** CONDITIONS FOR PERMIT COVERAGE; **III.** DISCHARGE PROHIBITIONS; **IV.** EFFLUENT LIMITATIONS ; **V.** ACTION LEVELS (ALs); **VI.** RECEIVING WATER LIMITATIONS; **VII.** PROVISIONS; **VIII.** PROJECT PLANNING REQUIREMENTS; **IX.** PROJECT IMPLEMENTATION REQUIREMENTS; **X.** STORM WATER POLLUTION PREVENTION PLAN (SWPPP); **XI.** RAIN EVENT ACTION

PLAN (REAP); **XII.** CONDITIONS FOR TERMINATION OF COVERAGE; **XIII.** REGIONAL WATER QUALITY CONTROL BOARD (REGIONAL WATER BOARD) AUTHORITIES; **ATTACHMENT A** – GLOSSARY; **ATTACHMENT B** – STANDARD PROVISIONS; **ATTACHMENT C** – APPLICATION INSTRUCTIONS AND FORMS (NOI); **ATTACHMENT D** – STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS; **ATTACHMENT E** – MONITORING PROGRAM AND REPORTING REQUIREMENTS; **ATTACHMENT F** – SEDIMENT TRANSPORT RISK WORKSHEET; **ATTACHMENT G** – NEW AND RE-DEVELOPMENT PERFORMANCE STANDARD WORKSHEET; **ATTACHMENT H** – SEDIMENT BASIN SIZING.

General Comment on Construction Management Practices

Perhaps most importantly, the Draft Permit does not sufficiently emphasize good construction management practices as the first priorities in stormwater pollution prevention planning. These practices include: (1) performing ground disturbing work in the dry season and working off the ground or inside in the wet season; (2) disturbing as little as possible at a time, and certainly no more than can be brought under effective control if rain occurs; and (3) preventing drainage off the site by forming recessed areas that can contain drainage from minor or major excavations and stockpiles. The Draft Permit should highlight these practices in all appropriate places, especially in **IX, X,** and **Attachment D.**

Comments on **I**. Findings

I support the Draft Permit's requirement to maintain pre-development hydrologic characteristics (**I.9**) and groundwater recharge (**I.31**). I further support the concepts of Numeric Effluent Limits (NELs) and Active Treatment Systems (ATSs, **I.10**). However, the specific numbers for the pH and total petroleum hydrocarbon (TPH) NELs should be changed, and a NEL should be adopted for turbidity, as indicated below. Also, the footnote to **I.10** should list advanced filtration as an additional potential ATS.

The concept of Action Levels (ALs) is a step forward from the preceding permit but does not provide a solid basis for dischargers, regulators, or citizens to judge permit compliance (**I.10**). Turbidity should not be managed with an AL but instead by a NEL, as discussed below. Also, the specific numbers set for the ALs adopted are too high (see below).

I support the presentation of a comprehensive list of construction materials that can produce high pH discharges and must be controlled regardless of storm size (**I.11**). However, based on the ease of implementing pollution controls related to the sources of high pH discharges, 18 months after permit adoption is too long before the pH NEL takes effect and should be reduced.

I.12 is unclear in two respects about "low risk" sites with a low erosivity factor: (1) Does the permit coverage waiver apply only to 1-5 acre projects or to any size? This point should be clarified to apply only to 1-5 acres. (2) Does the permit coverage waiver apply only to projects disturbing ground in the dry season or at any time of year? Later, the permit seems to indicate that the waiver applies only in the dry season, but this point should be clarified in **I.12**.

The turbidity AL of 500 NTU (**I.13, V.2**) is an immense number and does will not ensure that best management practices (BMPs) developed and implemented will protect water quality. It appears that it was derived on the basis of conditions in several areas of the state using the Modified Universal Soil Loss Equation and the questionable assumption of a 1:1 relationship between turbidity and total suspended solids. In fact, these two measures of particles in water are very different in terms of analysis and what they represent. While 500 NTU could apply in some relatively arid natural areas, it almost certainly would not represent locations lightly disturbed by humans and naturally vegetated. Beyond establishing a number that is too high to be protective of water quality, I recommend that turbidity should be managed by an NEL rather than with an AL, as I elaborate on below in the comment on **IV**. If the State Board continues to set a turbidity AL, it should be changed to require use of either: (1) a value determined by the permittee through monitoring discharges from the site before ground disturbance, according to guidance developed by the State Board; or (2) a regional value, selected to be conservative in terms of protecting the environment, developed by the State or Regional Boards from representative measurements in the region.

I.14-16 should emphasize the requirement that discharges not cause or contribute to violations of water quality standards. While **I.28** specifies this requirement, it should also be included in the earlier passages to emphasize the importance of this aspect of compliance with the Draft Permit.

I support the requirements for receiving water monitoring (in **I.17**) and discharge monitoring (in **I.26**) for high- and sometimes medium-risk sites and AL violators. Furthermore, provided that ALs remain in the final version of the permit (and are not substituted with the preferable NELs as recommended) I support the requirement for Action Level Exceedence Evaluation Reports (**I.18**).

The Active Treatment Systems option for sediment control when more than 10% of soil particles are less than 0.02 mm in size (**I.19**) is a positive addition to the Draft Permit. The concerns that I have heard expressed about the potential toxicity of the chemicals employed should not prevent the State Board from including this as an option for controlling sediment at construction sites. As an example of how to manage the use of these systems to be certain toxicity concerns are adequately address, that the State Board should look to Washington state and its consturciton stormwater program. Washington's Department of Environmental Quality has over 10 years of experience with these systems, has found them to be effective, and has developed protocols to design and operate them to achieve effective performance and prevent toxicity in discharges.[1] *See e.g.*, http://www.psat.wa.gov/Publications/psnotes_pdf/PS_Notes_43.pdf (page 5);

[1] Regarding specific technologies, Washington has approved the following advanced treatment methods for use on construction sites (http://www.ecy.wa.gov/programs/wq/stormwater/newtech/technologies.html#construction):

- Clear Creek Systems Chitosan-Enhanced Sand Filtration Using FlocClear™(GULD and CUD) [http://www.ecy.wa.gov/programs/wq/stormwater/newtech/use_designations/ccs_flocclear_cud_2_21_07.pdf]
- Water Tectonics Electrocoagulation Subtractive Technology (CUD) [http://www.ecy.wa.gov/programs/wq/stormwater/newtech/use_designations/wteccud_12_4_06.pdf]

http://www.ecy.wa.gov/programs/wq/stormwater/ww_stormwater_manual/final_bmp_c250_12_06.pdf;
http://www.deq.state.or.us/WQ/stormwater/docs/nwr/flocculation.pdf;
http://www.protech-services-inc.com/docs/TR01.1-electronic.pdf;
http://www.forester.net/ec_9911_review_sediment.html.

In general, the requirement to develop and implement Rain Event Action Plans (REAPs, **I.20, XI**) is an improvement in the Draft Permit. However, as currently drafted the procedure for REAPs will not be an effective one. Section **XI** says:

> The discharger shall develop and implement a Rain Event Action Plan (REAP) designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event. The REAP shall be a written document specific for each rain event.

As written, this statement suggests there will be a separate plan written for each storm during the 2-day period before the event's expected arrival. This is not a good idea for two reasons. The REAP should be a true contingency plan, which looks ahead to the conditions that could exist during the course of the work and sets procedures and sees that materials are acquired to implement them. Writing a separate plan for each event would be burdensome and, frankly, probably would not get done. Also, only allowing for two days for development and implementation likely would not allow enough time to obtain materials. In order to improve the REAP requirement, a REAP should be written at the same time as the SWPPP to set general policy and procedures, and the REAP should be adjusted as necessary as time goes along, just as a SWPPP should be.

The requirements to perform risk assessments (**I.21, 22, 25**) and to inspect sites before, during, and after rain (**I.30**) will ensure that proper BMPs are develop and implemented to be effective in the variable and constantly changing circumstances associated with construction activities. However, I do not see any justification for the waiver of the requirement to prepare a SWPPP for low-risk projects (**I.26**) and exempting oil and gas exploration from permit requirements (**I.33**). These types of projects also present a risk to water quality and assuring that these projects develop and implement appropriate measures to control pollution is necessary to protect water quality.

<u>Specific Comments and Recommendations on **IV**. Effluent Limitations</u>

Presented below are comments and recommendations on the numeric effluent limitations in the Draft Permit and an explanation of the feasibility of numeric effluent limitations for pollutants beyond those required by the Draft Permit.

- Chitosan Enhanced Sand Filtration Using StormKlear™ LiquiFloc™ (GULD) [http://www.ecy.wa.gov/programs/wq/stormwater/newtech/use_designations/liqui_floc_gud__3_7.pdf]

Note: GULD means generals use level designation; CUD means condition use designation.

The NEL range for pH (5.8-9.0) is too wide (**IV.3**). Active Treatment Systems are required to discharge within a range of 6.5-8.5, but there is no justification for the greater latitude given to general discharges. Adding excessive acidity or alkalinity to the receiving water has the same deleterious effects on aquatic life no matter where the responsible hydrogen or hydroxyl ions originate. The Fact Sheet states that the range was derived from Caltrans construction site data, with an arbitrary one standard deviation tacked on the top and bottom of the data range. The permit should be consistent with 6.5-8.5.

The permit should set a NEL for turbidity based on the capability of best conventional technology (BCT) BMPs to control effluent turbidity (**IV**). There is an ample basis for doing so, which the State Board should acquire, analyze, and apply to set the NEL. My own research (Horner, Guedry, and Kortenhof 1990, http://www.wsdot.wa.gov/Research/Reports/200/200.1.htm) tested the erosion control effectiveness of a variety of blanket and mulch products intended for temporary erosion control service relative to soil loss from bare slopes. Bare soil turbidity ranged from 63 to > 1000 NTU (not quantified above 1000 NTU). The most effective erosion control product was wood fiber mulch applied at two different rates along with a bonding agent and grass seed in sufficient time before the tests to achieve germination. Plots treated in this way reduced influent turbidity by more than 97 percent and discharged effluent exhibiting mean and maximum turbidity values of 21 and 73 NTU, respectively. Some other mulch and blanket materials performed nearly as well. These tests demonstrated the control ability of widely available BMPs over a very broad range of erosion potential.

These products have become standard materials for erosion control and, in fact, have been improved in the more than 15 years since the study was performed. Hence, these materials represent BCT. Given their demonstrated ability to achieve effluent turbidity of 73 NTU at the highest, and averaging much less, it appears to me that an NEL for turbidity can, and should, be set much lower than the proposed 500 NTU AL.[2] There is a body of other information that the State Board should assess to determine that an NEL for turbidity is both appropriate and feasible. Caltrans completed the District 7 Erosion Control Pilot Study in 2000 (http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-00-012.pdf). This study did not record turbidity but did express erosion rate in terms of the dry weight of soil loss per unit area and per millimeter of incident rain. Several mulch and blanket products reduced the mean erosion rate by more than 98 percent. For years the Texas Transportation Institute has had a laboratory to test erosion control products and certify them for use in that state's highway construction projects. Information can be found at http://tti.tamu.edu/facilities/facility_detail.htm?cat_id=3218&fac_id=10 and http://tti.tamu.edu/groups/aem/.

Overall, the ability for standard erosion control materials to control turbidity demonstrates that a NEL is feasible. The State Board should review the studies cited above and adopt an NEL that reflects BCT.

[2] As noted above, in the driest regions of the State, a variance on the NEL for turbidity may be appropriate to account for the difficulty in controlling sediment runoff.

Specific Comments and Recommendations on **V**. Action Levels

The total petroleum hydrocarbon AL (15 mg/L) is very high relative to the concentration routinely measured in urban runoff (**V.3**). The Fact Sheet indicates that the basis for the number is the level of control an oil/water separator can provide. This is an improper basis since good housekeeping practices specified by the Draft Permit can provide a level of source control, if properly implemented, that will keep runoff much cleaner. Oil/water separators, in fact, can do better than discharge 15 mg TPH/L; but regardless of their capability, such separators would never be used to clean up construction site runoff. In the great majority of measurements, general urban runoff is considerably lower than 10 mg/L as TPH or oil and grease. An appropriate Action Level would therefore be 5mg/L rather than 15 mg/L.

Specific Comments and Recommendations on **VI**. Receiving Water Limitations and **VIII**. Project Planning Requirements

I support the limit of no more than 0.2 pH units above or below the receiving water level (**VI.6**). However, the limit should also apply to low-risk projects. As explained above, low-risk projects will still impact receiving water quality and limitations on these impacts should apply equally to these projects. Further, requiring these projects to sample will help generate the data on receiving water quality that the Fact Sheet acknowledges is still needed.

I also support the requirement for soil particle size analysis (**VIII.B.1**). However, also requiring soil testing for nutrients and using the results to specify fertilizing at rates that do not exceed what plants need to make up the deficit is recommended to prevent nutrient runoff to surface water and/or leaching to groundwater.

Specific Comments and Recommendations on **IX**. Storm Water Pollution Prevention Plan (SWPPP)

Allowing an area not to be actively worked for 14 days without being stabilized has carried over from previous permits but this period is too long (**IX.C**). The period should be reduced, especially in the wet season for high- and medium-risk projects. Instead, it is recommended that the permit establish a 3-day maximum in the wet season at high-risk projects with a graduated increase for lower risk cases, the dry season, and arid areas. The 14-day period may only be appropriate inlow-risk projects in the dry season.

The slope length allowances in **IX.E.4** are too long (300 ft for 0-5% slope, 150 ft for 5-10%, 75 ft for >10%). Based on Universal Soil Loss Equation estimates, the soil loss with a 5% slope 300 ft long would be approximately 10 times the loss at 1% and 300 ft. The soil loss would roughly double again with a 10% slope 150 ft long. Another approximate doubling would occur with a slope of 20% and 75 ft length. Further, in some cases building will occur on even steeper slopes than 20%. At 40% and 75 ft long the loss would be about three times as great as at 20% and the same length. This area of the permit must be reworked to provide more specific

guidance on slope lengths that address the substantial differences in soil loss currently allowed by the Draft Permit.

Limiting traffic to stabilized driveways (**IX.E.7**) is an excellent measure.

The source control option to using Active Treatment Systems (**IX.H**) has a few weaknesses that should be corrected. For example, it requires maintaining vegetation "as much as possible" (a vague standard); allowing up to 5 acres of disturbance; and using the universal 14-day based definition of active vs. inactive areas). In order to be effective, as well as provide clear guidance to the regulated community, the option should require retaining all runoff onsite, or severely limiting disturbance area and time before an area not being worked must be stabilized.

In general the good housekeeping requirements (**IX.I**) will help to protect water quality. However, they should be made more prescriptive regarding vehicle fueling, cleaning, and maintenance. For example, I recommend adding the requirement to separate these activities from possible contact with rainfall or runoff.

Though they represent an excellent improvement over previous iterations of the construction permit, the Stormwater Performance Standards (**IX.K**) need some adjusting. The post-development runoff standard should be restated in the following terms to reflect what I believe is the desired goal of the requirement – to minimize adverse effects of development by preventing an increase in pre-development runoff peak volumes and flow rates. To achieve this goal, instead of saying that post-development runoff should "approximate" pre-development volumes (**IX.K.1**), this section should be modified to state: *Post-development runoff peak flow rates and volumes shall not exceed pre-development quantities for the full range of rainfall frequencies, durations, and amounts.*

Preserving drainage divides should be required of all permittees, and not just sites larger than 2 acres (**IX.K.2**). Sites over 50 acres are to preserve drainage patterns (**IX.K.3**). The Fact Sheet is not helpful in justifying these size thresholds. Without a justification for these size thresholds it is difficult to evaluate their soundness or proposed effectiveness in achieving their purpose.

Specific Comments and Recommendations on **X-XIII**

The Draft Permit does not state that SWPPPs and REAPs must be submitted to the permitting authority and reviewed (**X, XI**), although the Fact Sheet (page 31) implies that SWPPPs will be submitted electronically (but not reviewed). Section **XIII** says, "Regional Water Boards shall administer the provisions of this General Permit. Administration of this General Permit may include, but is not limited to, requesting the submittal of SWPPPs, reviewing SWPPPs, reviewing REAPs, … ." This statement implies that Regional Boards have the right to ask for SWPPPs and REAPs and review them but will not necessarily do so. The permit and fact sheet should make it clear that SWPPPs and REAPs must be submitted and that Regional Boards will review them.

Vegetation cover of 70% is too little to consider a site to be fully stabilized (**XII.2**). The requirement should be at least 90% vegetation cover, or minimum 70% with the remaining 30% to be provided by effective temporary cover (e.g., bonded fiber matrix, sturdy mulch, straw or coconut blanket).

Specific Comments and Recommendations on **Attachment D**. Storm Water Pollution Prevention Plan (SWPPP)

The SWPPP provisions (**Attachment D**) should include a requirement to present a site analysis that identifies potential problem locations and informs BMP selections. The analysis should take into account soils, hydrologic, hydraulic, topographic, and land cover data.

Specific Comments and Recommendations on **Attachment E**. Monitoring Program and Reporting Requirements

Regarding monitoring, I first want to comment that the State Board should not confuse monitoring for compliance assessment with monitoring to provide data to improve the permit program. The latter type of monitoring is essentially a research effort, which requires a clear and complete statement of objectives, an experimental design, and carefully specified and executed procedures, including extensive quality assurance and control. Permittees' monitoring to determine compliance has a completely different objective and simply cannot meet those standards. The State Board should define the questions it believes need to be answered and design and conduct specific monitoring programs to get those answers, I recommend in cooperation with a university or other entity experienced in performing research.

For example, there seems to be a hesitation to move directly to a NEL for turbidity, while I believe the basis exists to do so now, in the form of well proven BCT BMPs. Perhaps this hesitation is associated with the State Board's uncertainty of what is necessary to protect water quality standards. If the Board indeed does have this question, the proper way to answer it is not to utilize permittees' compliance data but instead to set up a study to measure turbidity and other water quality variables in discharges and receiving waters (and, preferably measure biological quantities in the water bodies as well). In the meantime, the Board should still set a turbidity NEL based on BCT. It is improper in my opinion to avoid the NEL now, with BCT capable of achieving an NEL readily available, and wait years for the study to be completed, years during which water quality standards are likely to compromised.

Moving to specific provisions of this attachment, sampling within 1 day after first 0.5 inch of rain and then after every inch is too little, too late (**Attachment E, section E**). Sampling should commence in the first hour of runoff and then be performed at least once every 3 hours until either the storm or the work day ends.

I generally support the sampling locations required by **Attachment E, section F**. However, the receiving water monitoring requirements should be expanded. If a discharge does not go directly into a receiving water but reaches it via a conveyance, the conveyance should be sampled before and after the permittee's discharge to assess its likely impact on the receiving water. Also, this

section mentions sampling run-on waters, possibly to make the point that they caused a violation, not the runoff generated on the site. Instead of encouraging monitoring to create an excuse, the permit should take the opportunity to emphasize in one more place that run-on should generally be prevented with the use of appropriate best management practices.

Specific Comments and Recommendations on **Attachments F**. Sediment Transport Risk Worksheet and **G**. New and Re-development Performance Standard Worksheet

The risk assessment procedure (**Attachment F**) is an improvement in the Draft Permit since it will allow permittees and regulators to better assess appropriate BMPs and other measures to control pollution from construction sites. However, step 4 will be confusing to many users. It should be laid out more clearly and provide more application data (or at least clearer links to the data).

I strongly support the new development and redevelopment performance standards in **Attachment G**. This permit is the appropriate place for these standards, for several reasons. First, like any other facet of a construction project, stormwater management must be planned from the beginning and not grafted on after the fact. Furthermore, the SWPPP requirements include a post-construction BMP section, which should be developed in full. Finally, most of the land area of the state subject to building does not lie within an area under the municipal Phase 1 or Phase 2 permits. Hence, the construction permit represents the only chance the state has to bring effective stormwater management to these areas.

These standards in **Attachment G** include some but not all low impact development (LID) techniques. The list of LID measures should be made comprehensive. A key omission that should be added is water harvesting, especially from rooftops. Furthermore, the permit should require analysis of LID options first, maximum possible use of workable options for post-construction stormwater management, and conventional best management practices for any portions of the site that cannot be managed with LID practices.

As I mentioned in the charette held on Wednesday April 25, 2007 to discuss the procedure in Attachment G, it is a good start. However, it should be improved over time through better hydrologic modeling techniques and by requiring builders to obtain and use site-specific soils and hydrogeological information to site and design soil- and vegetation-based BMPs.

BACKGROUND AND EXPERIENCE

I have 41 years of professional experience, 38 performing research and teaching at the college and university level. For the last 30 years I have specialized in research, teaching, and consulting in the area of urban storm water runoff and surface water management. I was graduated with the Ph.D. in Civil and Environmental Engineering by the University of Washington in 1978, following two Mechanical Engineering degrees from the University of Pennsylvania. For 12 years beginning in 1981 I was a full-time research professor in the University of Washington's Department of Civil and Environmental Engineering. I now serve half time in that position and have adjunct appointments in two additional departments. While

my research and teaching continue at a somewhat reduced level, I spend the remainder of my time in private consulting through a sole proprietorship. I would be pleased to provide my full curriculum vitae upon request.

My research, teaching, and consulting embrace all aspects of stormwater management, including determination of pollutant sources; their transport and fate in the environment; physical, chemical, and ecological impacts; and solutions to these problems through better structural and non-structural management practices. One substantial area within the stormwater management field involving all of these considerations is the understanding of aquatic resource problems caused by runoff from sites of soil disturbance, such as construction projects, and how best to avoid or minimize these problems. Another area in which I have considerable experience is the capability of stormwater management best management practices ("BMPs"), both conventional and more recent "low-impact development" types, installed to control the quantity and quality of runoff from urban areas.

I have conducted numerous research investigations and consulting projects on these subjects. Serving as a principal or co-principal investigator on more than 40 research studies, my work has produced two books, approximately 30 papers in the peer-reviewed literature, and over 20 reviewed papers in conference proceedings. I have also authored or co-authored more than 75 scientific or technical reports. In addition to graduate and undergraduate teaching, I have taught many continuing education short courses to professionals in practice. My consulting clients include federal, state, and local government agencies; citizens' environmental groups; and private firms that work for these entities, primarily in Washington, California, British Columbia, and Oregon but in some instances elsewhere in the nation.

I have been active in the area of construction site stormwater management for more than 20 years. During that time I have: (1) performed research on the performance of certain BMPs intended to prevent soil erosion or interdict sediment transport, (2) functioned as an independent mediator on a sensitive road construction project, (3) served on a technical advisory committee for a very large research project of this type, (4) taught numerous courses on the subject, and (5) inspected many construction sites myself. My research pertained to the effectiveness of soil-covering mulches and blankets in preventing erosion and of silt fences and sedimentation ponds in stopping the transport of sediments entrained in runoff beyond the construction site. As a mediator, my responsibility was to reconcile and make judgments and recommendations based on the information coming from the contractor, the sponsoring city road agency, the city's environmental inspectors, independent consultants, and my own observations. On the advisory committee I had an oversight role on behalf of the plaintiffs for a federal court-ordered study sponsored by the California Department of Transportation ("Caltrans") as defendant. This study measured the effectiveness of 16 mulches and blankets and certain soil preparation techniques. I have taught continuing education courses on construction site pollution control, ranging from a half day to six days in length, more than 30 times to consultants, regulators, and contractors. Presently, I am teaching an on-line course on environmental regulations in the graduate-level construction engineering program at the University of Washington. The bulk of this course concerns the full range of construction site storm runoff issues and management practices.

I have very substantial familiarity and experience with California and its environment and the status of stormwater management there. My involvement began in 1993, when I reviewed fulfillment of the stormwater National Pollutant Discharge Elimination System permit requirements, including construction site requirements, by many of the Los Angeles County co-permittees and Caltrans. Documented non-compliance led to four lawsuits concluded with settlement agreements (Los Angeles County and three cities) and one lawsuit prosecuted in federal court that led to a permanent injunction (Caltrans). In each case, and later under a consent decree in a separate Caltrans case in San Diego, I was appointed by the overseeing federal court judges to represent plaintiffs in monitoring implementation of the orders. I worked integrally with Los Angeles County's consultants to develop the county's broad-based stormwater program, prominently featuring construction site management. Annually, for twelve successive years, I have visited Caltrans' construction sites to inspect their compliance with injunction and consent decree terms. I have also evaluated the stormwater programs in Orange, Riverside, San Bernardino, Santa Barbara, San Luis Obispo, Monterey, San Diego, and Ventura Counties and been involved in extensive discussions with Orange County leading to upgrading its program. At the recommendation of San Diego Baykeeper, I have been a consultant on stormwater issues to the City of San Diego, the San Diego Unified Port District, and the San Diego County Airport Authority.

I was recently appointed to the National Academy of Sciences-National Research Council (NAS-NRC) panel on Reducing Stormwater Discharge Contributions to Water Pollution. NAS-NRC panels bring together experts to address broad national issues and give unbiased advice to the federal government. The present panel is the first ever to be appointed on the subject of stormwater. Its broad goals are to understand better the links between stormwater discharges and impacts on water resources, to assess the state of the science of stormwater management, and to apply the findings to make policy recommendations relative to municipal, industrial, and construction stormwater permitting.

I would be glad to discuss my comments and recommendations with you or anybody you designate and invite you to contact me if you wish to do so.

Sincerely,

Richard R. Horner