Western States Petroleum Association
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Senior Coordinator, Bay Area and State Water Issues

VIA ELECTRONIC MAIL

June 11, 2008

Chair Doduc, and Members of the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Subject: WSPA Comments on the March 2007 Preliminary Draft NPDES General Permit for Storm Water Discharges Associated with Construction Activities

The Western States Petroleum Association (WSPA) is pleased to submit the following comments on the March 2008 Draft Construction General Permit. WSPA is a non-profit trade association representing twenty-six companies that explore for, produce, refine, transport and market petroleum, petroleum products and natural gas in six western states – California, Arizona, Nevada, Oregon, Washington and Hawaii.

WSPA member companies own and operate various types of facilities (e.g., oil and gas production properties, refineries, marketing terminals, retail gasoline outlets, etc.) that will all be impacted by the Construction Storm Water General Permit.

WSPA would like to support and endorse the comments (attached) submitted by the California Stormwater Quality Association (CASQA). WSPA is a member of CASQA and has worked with CASQA to develop their comments.

WSPA would like to re-iterate CASQA's comments regarding Numeric Effluent Levels (NELs), Numeric Action Levels (NALs), and the lack of a "design storm" in the permit.

NELs
WSPA strongly supports CASQA's recommendation that the NELs provisions in the draft permit be deleted. WSPA agrees with CASQA that there is insufficient data (both

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receiving water and construction site discharges) to establish a state-wide NEL for turbidity/suspended solids or pH. Further we agree that the NELs in the draft permit are inconsistent with the Blue Ribbon Panel (BRP) recommendations that tied NELs to Active Treatment Systems (ATS) and that their proposed implementation scheme will lead to inappropriate minimum mandatory penalties.

NALs

Like CASQA, WSPA supports NALs as a means to improve the iterative stormwater pollution prevention plans (SWPPPs) and best management practices (BMPs) system in the current permit. However just like CASQA, we support NALs where they are scientifically defensible and where adequate data is available to appropriately establish them. Consistent with the BRP Report, WSPA supports the use of NALs that are designed and selected to identify upset conditions, to require dischargers to address the upset conditions, and to give additional attention to "bad actors." WSPA urges the State Board to modify the NAL scheme in the permit to be consistent with the BRP recommendations and develop NALs based on science and adequate data.

Design Storm

WSPA supports CASQA's recommendation that the draft permit establish a design storm or more aptly a compliance assessment storm during which the NELs would be in effect, and beyond which the NELs would not apply. The design storm should also be applicable for the NAL provisions in the draft permit. As rainfall regimes vary throughout California, WSPA supports CASQA's recommendation that the permit incorporate design storms consistent with geographic distribution of NRCS Type 1, 1A and 2 rainfall zones.

Thank you for considering our comments. We look forward to continuing to working with State Board staff to make the final permit workable, effective and protective of water quality. If there are any questions, please do not hesitate to contact me.

Sincerely,

Kevin Buchan

Attachments: CASQA Comment Letter, Dated June 10, 2008
CASQA Technical Memorandum, Landphair, et al.

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CASQA
California Stormwater Quality Association™
Dedicated to the Advancement of Stormwater Quality Management, Science and Regulation

June 10, 2008

Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Submitted via email commentletters@waterboards.ca.gov

Subject: Comments on the March 2007 Preliminary Draft Construction Stormwater Permit

On behalf of the California Stormwater Quality Association (CASQA), thank you for the opportunity to provide comments on the March 2008 Draft Construction General Permit. CASQA appreciates this opportunity to comment on this draft permit especially as it potentially represents a significant shift in California's approach to regulating stormwater discharges.

CASQA is composed of stormwater quality management organizations and individuals, including cities, counties, special districts, industries, and consulting firms throughout California. Our membership provides stormwater quality management services to over 26 million people in California and includes most every Phase I and many Phase II municipal programs in the State. CASQA was formed in 1989 to recommend approaches for stormwater quality management to the State Water Resources Control Board (State Water Board).

The CASQA construction subcommittee includes a broad representation of the entities that will be affected by the permit, including municipalities, developers, and regulators. CASQA has been involved with each issuance of California's construction general permit and has been a steadfast advocate for construction stormwater permits that protects water quality and is workable for construction operations.

CASQA was pleased to see several improvements to the permit language resulting from the Preliminary Draft Permit and subsequent stakeholder process. CASQA was especially pleased to see modified and improved language relating to:

- Active Treatment Systems;
- Rain Event Action Plans;
- Allowances for emergency construction and maintenance projects; and
- Clarifications of when permit coverage begins following submission of Permit Registration Documents (PRDs) and improved timing of when PRDs must be submitted.

However, CASQA remains concerned about several elements of the March 2008 draft permit. Some of CASQA's more significant concerns include:

- Change in regulatory approach for stormwater discharges from the iterative BMP-based approach to a numeric effluent limit-based approach.
- Incorporating numeric limits (both effluent and action levels) without addressing the concerns for the use of these numeric limits expressed by the State Water Board's Blue Ribbon Panel (BRP) Report on *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction* Activities (Currier et al., 2007).
- Establishing numeric effluent limits without developing a scientifically sound and defensible methodology that is in accordance with USEPA protocols.
- Including hydromodification requirements in a construction activity permit (although the language is significantly improved by deferring to MS4 permits).
- Lack of pre-defined processes and timelines for many critical path elements that require Regional Board approvals or processes.
- Requiring discharger conducted receiving water monitoring.

CASQA offers the attached comments and observations on the March 2008 draft permit Attachment 1). The comment and observations address the practical implementation, policy implications, requests for clarification of requirements, and suggested language for improving the permit. The attached comments are generally structured by identifying the subject issue, with a summary comment, followed by comment details. In this latter section, language suggestions or details on the issue are identified. Two additional attachments provide further details on numeric effluent limits (Attachment 2) and a technical review of use of RUSLE and MUSLE in various parts of the draft permit (Attachment 3).

CASQA understands that comments received during the workshops on the preliminary draft permit and the workshops on the March 2008 draft permit were not entered into the record; therefore some of the comments included in this submission duplicate those CASQA made on the preliminary draft permit or questions asked during the May 2008 workshops. Comments made by CASQA on the preliminary draft permit are also attached in full (Attachment 4).

Finally, CASQA would like to take this opportunity to address the questions posed by Vice Chairman Wolff.

1. *The permit attempts to balance the need for simplicity and transparency with the need to sensitively address widely different physical conditions across sites. In what parts of the draft permit do you think complexity is most and least valuable?*

In essence a general permit is an attempt to distill a complex water quality protection program into a set of requirements that generically apply to a broad spectrum of dischargers. IN USEPA's General Permit Program Guidance, stormwater discharges are specifically identified as warranting a general permit approach to simplify and reduce the administrative burden of regulating a large number of dischargers. However, if one looks at the criteria for point sources

that qualify for a general permit approach, e.g., same or substantially similar operations, similar waste streams, same effluent limitations, it is obvious that stormwater is a difficult fit. The SWPPP is the tool that makes the fit work and turns the generic permit requirements into a specific water quality protection program. The SWPPP, not the permit, must embody the complexity necessary to protect water quality during construction operation.

The permit needs to create a simple set of requirements and outcome expectations. Tools required or suggested by the permit language need to allow for the flexibility of site conditions, regional climate differences, and construction types and practices. With this approach the regulated community, the regulators, and the public with be better able to assess site performance and compliance with permit requirements.

Specific Permit Elements

ATS are complex mechanical and chemical treatment systems that warrant a detailed set of requirements to ensure proper operation and protection of receiving waters. The permit appears to hit the right level of detail/complexity in regulating these systems especially given the diversity of system types. However, it might make the construction permit simpler if ATS requirements were included in a separate general NPDES permit.

A water quality **risk assessment** for construction sites should consider the relative proximity of the receiving water and the risk of sediment loss, which the draft permit does. However some elements of receiving water risk assessment move beyond proximity and require fairly complex analyses, such as channel stability. This is an unneeded level of complexity that does not enhance transparency or protection of water quality.

The **minimum BMPs** suggested in the permit are a level of detail that enhances simplicity, transparency and will enhance water quality protection.

Numeric action levels have the potential of enhancing compliance. These levels set a hard trigger reviewing and enhancing BMPs. The current permit lacks this hard trigger and without it, the incentive or requirement to reassess and improve practice during construction was missing. A properly set NAL will enhance transparency and simplicity for dischargers and regulators.

Numeric effluent limits on the other hand are likely to unnecessarily complicate the permit and compliance processes. Dischargers exceeding NELs will be forced into a defensive and reactive position. Rather than a positive position of finding way better ways to protect water quality, dischargers and their attorneys will be in the position of trying to explain the violation and defend their actions from further punitive action.

2. *Our scientific understanding of when and where a management practice is best is limited. Self monitoring for compliance will not necessarily increase our understanding due to variations between practitioners and for other reasons. Are you interested in creating a scientifically valid database on management practice performance via rigorous third party 'random' monitoring in lieu of self-monitoring and at least partially paid for by permittees?*

To achieve the suggestion in this question that a *scientifically valid database on management practice performance* be created would require a rigorous applied research project. Individual BMP performance has been tested at various research facilities, such as, CalPoly, the Texas Transportation Institute, and the San Diego State Soil Erosion Laboratory. Testing of systems of BMPs under actual field deployment conditions is much more involved and has not be done to date.

The first step needed is to identify the specific management questions to be addressed. Each management question suggested in the draft permit fact sheet (noted below) may potentially warrant vastly different research approaches and projects.

- characterizing construction site effluent, statewide, regionally, etc.;
- characterizing the relationship between construction site runoff and receiving water impacts (effect on beneficial uses);
- evaluating site-specific performance (feedback for site "operators"); and
- determining compliance with permit requirements

Prior to agreeing to fund or partially fund such a project, dischargers would need to understand the management questions to be addressed, and have an idea of the scope of the project.

During the stakeholder process that occurred between the preliminary draft permit and the draft permit, there was general agreement amongst the discharger stakeholders that monitoring to create scientifically defensible data to fully characterize construction site runoff and monitoring to attempt to link construction site runoff to receiving water quality could not be feasibly conducted by dischargers. The only monitoring considered feasible for construction dischargers was field effluent monitoring, the results of which could be used to trigger follow-up actions on the construction site to improve performance.

3. *Ignoring the numbers and how they are calculated, do you think that the tiered compliance structure of the permit is a desirable or undesirable feature? By tiered structure we mean action levels 'backstopped' by higher numeric effluent limits that are intended to simplify enforcement against egregious violations.*

Ignoring the details of what the numbers are and how they are calculated, CASQA believes a tiered compliance structure could be a desirable feature in the construction stormwater permit, and suggested such an approach during the stakeholder process and previous workshops on numeric limits and stormwater policy. The approach CASQA suggested was the use of Action Levels and Action Level Ceilings. The CASQA concept was that values above the Action Level would be a level of concern to the site operator that the implementation of BMPs and the SWPPP needed to be checked and re-evaluated. The Action Level Ceiling was a high set point that would identify bad actors. The Action Level Ceiling in CASQA concept is very similar to the BRP definition of action level.

Considering the various definitions currently in use perhaps we should be careful about terminology. A tiered approach could embody an Action Level as defined by the BRP and a Benchmark as defined by USEPA in the multi-sector general permit

- Action Level = high set point, set to identify bad actors/situations; not a compliance point, not directly enforceable but should trigger follow-up actions by discharger and attention to site by regulators.
- Benchmark = typical performance, used to self-audit performance; not a compliance point, not directly enforceable), and self-trigger actions.

However CASQA does not believe that NELs work in the context proposed in the permit, nor in a tiered compliance system. NELs are typically low set points and are directly enforceable. It is not clear how a tiered compliance program with the NEL being the high point is compatible with the Action Levels or Benchmarks set at lower concentrations.

In closing, thank you for your consideration of our comments and for your efforts to resolve the issues raised during the process of revising Order 99-08-DWQ. CASQA recognizes the difficult technical and practical challenges of developing a permit to regulate construction stormwater runoff and hopes that the comments we are providing will assist the State Water Board in improving the permit making it a better tool for construction site operators to meet their challenge of protecting water quality during construction. Given the significant issues raised by this permit and the breadth of the suggested changes, CASQA requests that the State Water Board provide and workshop a revised Tentative Order for detailed public review and comment.

Please feel free to contact me if you have any questions regarding these comments, alternately you may contact Sandra Mathews 925-962-9700 Chair of CASQA's Construction Subcommittee.

Very truly yours,

Chris Crompton, Chair
California Stormwater Quality Association

Cc: Tam Doduc, Chair, State Water Board
Gary Wolff, Vice-Chair, State Water Board
Dorothy Rice, Executive Director, State Water Board
Darrin Polhemus, Deputy Director, Division of Water Quality, State Water Board
Bruce Fujimoto, Section Chief-Stormwater, DWQ, State Water Board
Greg Gearhart, Unit Chief-Industrial/Construction Stormwater, DWQ, State Water Board
Alexis Strauss, Director-Water Division, Region IX, USEPA
James Hanlon, Director-Office of Wastewater Permits, Office of Water, USEPA
Mary T. Smith, Director-Engineering & Analysis Division, Office of Science & Technology, OW, USEPA
CASQA Construction Subcommittee
CASQA Executive Program Committee
CASQA Board of Directors

CASQA Comments on the March 2008 Draft Construction Stormwater Permit
Attachment 1

Issue: Numeric Effluent Limits

Summary Comment

CASQA understands that the State Water Board is attempting to address the recommendations of the Blue Ribbon Panel Report within the draft permit; however, the use of numeric effluent limits (NELs) is premature and unnecessary. CASQA and others in the regulatory and scientific communities, including USEPA, recognize that, although the science of stormwater quality management continues to emerge and develop, there is currently not enough information to derive appropriate numeric effluent limits for construction dischargers.

Before NELs can be appropriately derived and incorporated into stormwater permits, the processes to derive numeric limits for stormwater discharges must be fully developed and must incorporate a scientifically sound and defensible methodology that is in accordance with USEPA protocols (see Attachment 1). Absent the application of USEPA protocols, the reissued construction permit must continue to clearly emphasize the iterative BMP-based approach, possibly including the incorporation of Numeric Action Levels (NALs), as the process for demonstrating permit compliance.

Further, CASQA was concerned to see the application of NELs in the draft permit in a manner not consistent with the recommendations of the BRP report. Two significant general concerns noted by the BRP were not addressed by the State Water Board in the draft permit.

1. Whether NELs are "prudent, practical or necessary to more effectively achieve nonpoint pollution control"; and
2 While NELs were likely feasible for large construction sites utilizing active treatment system because these systems reliably produce consistent discharge quality, however sites where traditional erosion controls are used, produce highly variable runoff quality making "Numeric Limits difficult, if not impossible."

CASQA is opposed to NELs for construction site discharges. There is insufficient data (both receiving water and construction site discharges) to establish a state-wide NEL for turbidity/suspended solids or pH. Where data is available, the data suggest that natural background concentrations may at times exceed the NEL of 1000 NTU or the range of pH specified. There is no design storm specified to limit enforcement actions during events of unusual size or frequency. Finally, staff has indicated that violations of the NELs will trigger the mandatory minimum penalty sections of the Water Code (Section 13385(i)(1)(A). Given the data limitations, the challenges of statistically evaluating the data, the inter and intra storm variability it is inappropriate subject dischargers to mandatory penalties for violating effluent limits that have not been established in accordance with approved protocols.

Detailed Comments

The application of NELs in the March 2008 draft permit does not address the BRP findings and recommendations for their implementation, including the following:

- Seasonality of the application of numeric limits;
- Site factors such as degree of stabilization;
- Phased implementation of NELs commensurate with the dischargers' and support industry's ability to respond;

- Use of the average discharge concentration to evaluate compliance with numeric limits (whether NELs or NALs); with a determination of the appropriate minimum number of individual samples required to represent the average discharge concentration for a storm event; and
- Establishment that numeric limits (whether NELs or NALs) not apply during storm events of unusual size or pattern.

The BRP Report noted that "active treatment technologies make Numeric Limits technically feasible for pollutants commonly associated with stormwater discharges from construction sites (e.g. TSS and turbidity) for larger sites" - the NELs were clearly tied to the use of ATS in the BRP assessment. CASQA recommends elimination of the turbidity NEL, and that NALs be used to enhance the iterative BMP approach. It has not been demonstrated that NELs are necessary to improve water quality. NELs should not be considered necessary unless it is determined that action levels were not effective. It is more appropriate to use NALs and NELs in sequence instead of concurrently.

The draft permit does not address the need to establish a design storm or more aptly a compliance assessment storm during which the NELs would be in effect, and beyond which the NELs would not apply. Rainfall regimes vary throughout California. CASQA recommends that this concept be incorporated into the permit and that compliance assessment or design storms should be consistent with geographic distribution of NRCS Type 1, 1A and 2 rainfall zones.

The proposed technology-based effluent limits (TBELs)/NELs in the draft permit were not developed using standardized or rigorous protocols similar to what USEPA uses when developing TBELs/NELs and do not appear to consider important factors such as cost, feasibility, and effectiveness. If TBELs/NELs are necessary, they should be developed with a robust data set and this permit term should be used to collect the necessary data and/or conduct the necessary special studies. The use of TBELs that have not been well developed and are in the process of being tested may result in unintended consequences, such as, the use of program resources in an ineffective manner, antibacksliding conflicts should the TBEL need to be revised in the future, and unwarranted enforcement actions, including mandatory minimum penalties.

The draft permit states the NELs are technology based. The Fact Sheet (pg 13) does not link the NEL value to technologies, instead it seems to tie it to the potential to cause or contribute to an exceedance of water quality standards, and thereby indicating the value is a water quality-based effluent limit (WQBEL). The draft permit seems to mix the TBEL and WQBEL approaches.

Issue: Numeric Action Levels

Summary Comment

CASQA supports the use of NALs as a constructive next step to provide more accountability and direction to construction dischargers as they implement stormwater pollution prevention plans (SWPPPs) and evaluate the effectiveness of best management practices (BMPs). CASQA supports the use of NALs where they are scientifically defensible and where adequate data is available to appropriately establish them. Consistent with the BRP Report, CASQA supports the use of NALs that are designed and selected to identify upset conditions that would allow "bad

actors" to receive additional attention and use of a monitoring strategy that provides immediate feedback

The parameters pH and turbidity are well selected to target common construction site pollutants and allow dischargers to use commonly available field meters to make in-field assessments of BMP performance and implement immediate responses to field measurements.

Although CASQA concurs with the State Water Board's efforts to incorporate NALs, we have a few concerns/issues that we would like addressed within the General Construction Permit. CASQA's concerns include:

- The definition for NALs in the draft permit needs to be consistent with the definition in the BRP Report; and
- Appropriate statistics must be used to establish corresponding NALs, and the statistical analyses need to be provided in supporting technical documents for review.

The BRP Report identified an Action Level as an "upset" value that is clearly above the normal observed variability and is an interim approach that would allow the identification of "bad actors" to receive additional attention. The BRP called the Action Level an "upset" value because the water quality discharged from such locations would be enough of a concern that most would agree that some action should be taken. In setting a NEL higher than then NAL, the State Water Board appears to have turned the Action Level concept around, where as now the NEL identifies the "bad actors".

Detailed Comments

The proposed MUSLE-based process is uncalibrated and untested, and may not represent the current thinking in erosion and sediment control practices. CASQA commissioned a technical review of the MUSLE action level application by Harlow Landphair and George Foster, who have several technical comments and questions on the application and approach. (See Attachment 3)

The California Building Industry Association (CBIA) has proposed the following Action Level approach to State Water Board management and staff, which CASQA supports. To provide a bridge between the next two generations of construction stormwater permits, a NAL data collection program should be conducted during the upcoming permit cycle to provide critically needed information to aid the State Water Board in determining what provisions should be included in the subsequent permit.

Such a data collection program would include the following components:

- The program is a joint venture between the State Water Board and the industries regulated by the general construction stormwater permit;
- These industries would work with the State Water Board in choosing an independent contractor to conduct the program;
- Sites for data collection to be selected randomly using a defensible statistical design;
- Data to include water quality, site characteristics, BMP characteristics, storm characteristics, receiving water characteristics;

- Data to be gathered for range of representative sites (all risk categories, regions, soil types, receiving water risk);
- Work plan to be carefully designed to gather info to support next permit (data requirements will be determined by whether NALs or NELs are ultimate goal).

Additionally, the data collection effort can include:

- Data to calibrate and validate MUSLE approach;
- Data to determine BMP effectiveness at actual sites; and
- Data to assess inter- and intra-stormwater quality variability.

The Fact Sheet (pg 49) gives a description of the MUSLE equation. However the MUSLE equation on this page is different from the equation in Attachment C.

The MUSLE equation provided for calculating a site's turbidity action level implicitly uses a 2-year, 24-hour storm. However there is no exception from the follow-up actions required if the NAL is exceeded during storm events other than this design storm. CASQA recommends that the State Water Board include provisions to relieve the discharger from filing a NAL report and conducting the site reviews in these situations.

Issue: Mandatory Minimum Penalties

Summary Comment

The monitoring program described in draft permit could result in four violations occurring within the rolling six month period that determines a chronic violation for category 2 pollutants. Four violations might easily occur within a single storm event since the draft permit requires the assessment of NEL violations based on a single grab sample. An assessment of a chronic violation is especially likely to occur at Risk Level 2 and Risk Level 3 sites that are obligated to take multiple grab samples during storm events from each discharge location; these sites are likely to have multiple locations. Further, Risk Level 3 site are required to implement continuous monitoring once an NEL is exceeded, however no details are provided in the draft permit on how this continuous monitoring will be assessed for compliance with the NEL. If each discrete measurement during continuous monitoring is assessed as a single grab sample, the potential for chronic violations is greatly increased.

Comment Details

Consistent with the previous discussion, CASQA recommends that NELs be eliminated from the permit. The science of stormwater quality management is not yet mature enough to establish appropriate numeric effluent limits for construction effluent. Dischargers should not be faced with mandatory penalties, where exceeding an effluent limit is through no fault of theirs, but a failure to account for some variable in setting the effluent limit.

Further, the monitoring program should be revised such that the compliance is not determined on the basis of a field measurement of a single grab sample. CASQA recommends that the State Water Board develop a statistically valid number of samples upon which to make an overall compliance assessment for the discharger's construction project. The variability within a single storm event (intra-storm) and between multiple storm events (inter-storm) is such that

compliance determinations based upon a single sample is not appropriate (a BRP recommendation). At a minimum, compliance should be assessed in total for the samples taken during a single storm event on a weighted-average basis considering the relative size of contributing drainage areas for the entire construction site.
Finally, the permit needs to clarify how compliance will be assessed for sites implementing continuous monitoring.

Issue: Relationship of Turbidity Water Quality Objectives (WQOs) and NEL and NALs
There are several references in the Order and Fact Sheet that state "dischargers shall not violate any discharge prohibitions contained in any Basin Plan" and outline the WQOs for turbidity. During the May 2008 Workshops, State Water Board staff explained the interplay of the turbidity WQOs and the turbidity NALs and NELs. This explanation should be included in the Fact Sheet.

Issue: New Development and Redevelopment Runoff Controls

Summary Comment
CASQA does not believe that the general construction permit is the appropriate mechanism for accomplishing the goal of integrating long term water pollution controls into new development and re-development projects. Standards and measures can be identified in the permit for "runoff reduction" measures aimed at lessening the problems caused during construction that occur as a result of the tendency of new and redevelopment projects to change the landscape and related hydrology, however these should be specified for projects where they are appropriate and where the receiving water has been determined through analysis to be at risk for hydromodification.

CASQA appreciates the improvement to the language in the March 2008 draft permit limiting the application of these requirements to those areas not subject to Municipal Separate Storm Sewer System (MS4) hydromodification requirements. This will significantly reduce the application of duplicative or inconsistent standards. If the hydromodification language remains in the new permit, CASQA strongly recommends that the State Water Board establish a phase-in period for the new development and redevelopment requirements, as well as modify the language as noted in the detailed comments below.

Comment Details
A phase-in period is necessary to prevent disrupting on-going projects are those that were designed prior to the implementation date of the revised permit. It is infeasible for projects currently in construction to redesign to meet this standard. For projects, which are not yet in active construction, but have completed the design and/or have completed environmental review processes (e.g., NEPA, CEQA assessments and local planning approvals), redesign would be prohibitively costly and likely to jeopardize existing regulatory approvals. CASQA recommends the following:

- Projects permitted under Order 99-08-DWQ should be exempted from this requirement.
- Projects that can demonstrate that design was initiated prior to the implementation date of the revised order and has been completed, or regulatory reviews (e.g. NEPA, CEQA, 401 Certification) have been completed or local planning approvals have been received should be similarly exempt from the need to redesign to meet this requirement.

- Special circumstances may exist for publicly funded projects, such as schools, that the State Water Board should consider in establishing phase in dates for these projects that may extend beyond the conditions for exemption noted above.

Section VIII.H.1, of the draft permit limits application of the new and re- development requirements to avoid duplication with other water quality requirements. CASQA recommends that projects with 401 Water Quality Certifications or Waste Discharge Requirements (WDRs) that address hydromodification requirements also be exempt from this section of the construction permit.

Section VIII.H.2, of the draft permit states dischargers demonstrate compliance with the requirements of this section by submitting with their Notice of Termination (NOT) a map and worksheets in accordance with the instructions in Attachment F. CASQA believes "NOT" should be changed to Notice of Intent "NOI".

Add language in the SWPPP Item 10 provision – to note that projects in MS4 areas do not need to comply with SWPPP item 10 except to refer to the MS4s WQMP.

Section VIII.H.4, of the draft permit, specifies that for projects whose disturbed project area exceeds two acres, the discharger shall preserve the pre-construction drainage density for all drainage areas serving a first order stream or larger stream and ensure that post-project time of runoff concentration is equal or greater than pre-project time of concentration. Preserving the drainage density for all projects is exceptionally restrictive and greatly limits site uses. There are many effective BMPs, including Low Impact Development (LID) approaches that can be used to meet performance goals such as runoff volume reduction and pollutant load reduction. Maintaining existing drainage density will tend to encourage sprawl and increase the cost of development without benefiting water quality beyond what other equally effective approaches could provide. Further, without more detailed information regarding how the pre-project time of concentration criteria is to be applied, there is no assurance that it will have a benefit. Emerson et al., (2005)[1] discuss the potential pitfalls regarding the use of detention in urban setting.

CASQA recommends eliminating Attachment F and specifying varying requirements for the size and location of proposed development. For example, all sites should meet treatment criteria using the methods defined in the CASQA Handbooks. However, for flow control, if the development discharges directly into a large receiving water, such as the ocean, San Francisco Bay, Sacramento/San Joaquin Rivers, Lake Tahoe, or other similar water, then these project sites should be exempt since hydromodification from new development would not be a concern for these waters. Project sites discharging into engineered conduits (storm drains), channels, or channels with existing hard armor revetment channels should also be exempt. Otherwise large projects sites should be challenged with providing designs such that post-project runoff discharge volumes and durations do not adversely affect receiving waters. The channel forming flow needs to be determined for the receiving water and all discharges from the site larger than the

[1] Emerson, C.H., Welty, C and Traver, R.G., "Watershed-Scale Evaluation of a System of Storm Water Detention Basins," Journal of Hydrologic Engineering, May/June 2005, pp 237 – 242.

channel forming flow should be limited such that they are below the estimated pre-project discharge volumes and durations.

CASQA additionally suggests that any project site of 25 acres or larger be required to address any impact of additional flow on receiving waters and drainage systems within its environmental document (and provide mitigation if appropriate). Those sites of purely new development shall evaluate a range of storm sizes (e.g. Q2 to Q10) and design controls so that that peak flows and durations are equal or below pre-development conditions if hydromodification has been determined to be a concern based on the receiving water characteristics. When these conditions cannot be achieved, then the developer shall meet with the Regional Water Board to identify additional practices or strategies that could be implemented to address impacts from increased project site flows on receiving waters. The permit should require dischargers to use available and cost efficient design methods in an attempt to replicate the pre-project runoff volume and timing.

CASQA recommends that pages 40-43 (discussion of channel protection, bankfull stages including outdated Rosgen reference) be deleted or relegated to an appendix for use as needed.

Attachment H, item 10, could be improved by focusing on controls that treat stormwater or provide runoff reduction. Eliminate redundancy and make consistent with existing permit.

In general the text requires narrative on post construction BMPs required under Section VII.H of the draft permit. Most of the language is consistent with existing permit; however, 10.c of Attachment H is redundant to the previous items of items 10.a and 10.b. This is an acceptable idea with the following modifications:

> New Development and Re-development Stormwater Performance Standards
>
> The SWPPP shall include <u>all appropriate plans, final calculations, design details, and narrative description necessary</u> ~~the calculations used~~ to demonstrate compliance with the standards listed in Section VIII.H. of the General Permit.
>
> The SWPPP shall include a description of the operation and maintenance of control practices <u>that provide stormwater treatment and runoff reduction</u> that will be used after construction is completed, including short and long term funding sources and the responsible party.
>
> ~~The SWPPP shall include all appropriate plans, calculations, design details, and narrative description necessary to demonstrate the project has met the General Permit's stormwater treatment and runoff reduction requirements (Section VIII.H).~~

The instructions lead the preparer of the SWPPP through several actions to input data. Most of these instructions seem straightforward; however, they should be tested by several persons over several iterations before placing into use. The experience of our members who tested the system was that the crediting mechanism is not fully described in its purpose, function or use. What is to be done with the credit number gained after using the calculator? Is a negative number good

or bad? How does the user understand that they need to go back and make further improvements to reach State Water Board desired criteria for treatment and flow control.

The following presents some specific comments on the instructions:

- Step 8 – Reference to SCS 1986 in the footnote should be expanded such that it provides direct identification of the reference.
- Step 9 – It states, "Volume that cannot be addressed using non-structural practices must be captured in structural practices and approved by the Regional Water Board." Once again the SWRCB is looking for advance approval on site design at the juncture of construction. Furthermore, the materials called for submittal associated with this step are submitted with the NOT, which is at construction completion making infeasible for corrective actions could be implemented, as contingency funds may be limited and occupants/users may have taken control of facilities and property.

The draft permit says the discharger must replicate the pre-project water balance, then goes on to define "water balance" as the amount of rainfall that becomes runoff. Does satisfactory completion of the worksheets in Attachment F constitute compliance with the water balance matching requirement or are additional measures/documentation required? If a discharger uses a computer model instead of the worksheets, does he/she have to match pre- and post-project runoff volumes only or other parameters as well?

The draft permit says the discharger will have to get Regional Water Board staff approval for any structural control measures, but the permit does not specify what is considered to be a structural control measure nor is the approval process identified. A definition of structural control measures or detailed guidance is critical for the proper application of these requirements by dischargers and the Regional Water Boards. Many control measures that use landscape and landform are actually highly engineered control measures, such as a bioretention swale, or constructed wetland. It is not clear what makes a measure structural. Further, it is not practical to require that Regional Water Board staff approve all structural control measures. This requirement would greatly delay projects without any clear benefit. It is not possible for Regional Water Board staff to become knowledgeable about all construction projects in their region to the extent that they are qualified to make design decisions regarding the project water quality program. Permits have historically spelled out performance standards that have the collateral benefit of promoting advances in water quality science.

Issue: Reporting

Annual Report
Summary Comment
CASQA supports the inclusion of the annual reporting requirement. More clarity from the current vague annual certification requirement will improve annual assessment by dischargers. CASQA recommends that new permit retain the current annual reporting cycle with the annual report due in the summer, e.g., July 1, and report on the previous rain year (October through April).

Comment Details
The detailed requirements of the annual report and format should be provided during the comment period.

Setting the report date in the rainy season will take resources away from implementation. Summer is the best time to plan for the coming rainy season based on assessment of previous year, and is less disruptive to compliance processes currently established at construction sites. A July report provides adequate time to assess the previous year and plan alterations for the coming rainy season.

NAL Exceedance Reports
CASQA recommends the elimination of the NAL exceedance reports. Inclusion of information on NAL exceedances would be better included in the annual report where the exceedance, corrective actions, and subsequent water quality monitoring can be assessed more thoroughly. If the exceedance report is maintained, the submission time should be extended to 30 days to allow for a more thorough characterization.

Issue: Qualified SWPPP Developers and Qualified SWPPP Practitioners

Summary Comment
Specifying minimum requirements for SWPPP writers and implementation staff is appropriate and a needed element of the program. The draft permit specifies two levels of qualifications: qualified SWPPP developers (QSD); and qualified SWPPP Practitioners (QSP).

CASQA is concerned about the limitation of the QSD and QSP to certain professions or degrees, especially when it is not evident that the professions or degrees specified provide an adequate background in construction stormwater pollution prevention plan development. The specification of these professions and degrees will also limit the pool of otherwise qualified and experienced SWPPP developers.

Detailed Comments
Conceptually, it is critical that the QSP, who is the on-site SWPPP responsible person, be authorized by the permit to make and implement decisions regarding field activities to comply with the permit. To this end, the QSP must be able to write and modify Rain Event Action Plans (REAPs), modify monitoring programs, modify SWPPPs, etc. The draft permit only allows the QSP to create or modify the REAP. CASQA recommends that the QSP be given authority to modify the SWPPP and monitoring programs to respond to field conditions.

The permit language should make it clear that implementation of SWPPPs on a construction site and development of SWPPP can be done by trained personnel working under the direction of a QSD or QSP provided that the QSD or QSP stamps or signs the documents. Similarly, sampling personnel following the monitoring program identified in the SWPPP should not need to be QSPs.

As an alternative to the limitation of either the QSD or QSP to specified professions or degrees, CASQA recommends that these qualifications be awarded to those that demonstrate competency

by completing the state-sponsored or other state-approved training programs. Until such a program could be fully implemented, individuals with 5+ years of demonstrated experience and training in writing and/or implementing construction SWPPPs be considered respectively qualified to develop and/or implement SWPPPs.

Issue: Monitoring

Effluent Sampling

Summary Comment
CASQA supports the inclusion of effluent monitoring requirements that focus on providing information to the discharger and regulator to use in the evaluation of BMP implementation. Effluent monitoring for pH and turbidity using field meters is appropriate for construction projects and these parameters are well suited to quickly assess and respond to BMP performance. CASQA supports the removal of the TPH as a required constituent. CASQA strongly opposes the use of one sample to evaluate effluent quality and as a trigger for reporting or receiving water monitoring. The BRP suggested that average discharge concentration be used to assess compliance with the NAL. CASQA supports using a statistical approach to evaluate effluent data to assess compliance with Action Levels.

Comment Details
The effluent sampling trigger for subsequent samples is not consistent with Table 3 in the Monitoring and Reporting Program (MRP). Table 3 uses criteria for effluent sampling "storm event" and "new discharge", these should be made consistent with the definition of qualifying storm event used in the glossary and referenced elsewhere.

Suspended Sediment Concentration (SSC) analysis appears to be an analysis that is not generally performed commercially. CASQA members contacted numerous commercial laboratories to determine availability, and cost of the analysis none of the laboratories conducted the test and most laboratories contacted were not familiar with the method. After speaking with State Water Board staff we found one laboratory in California that performs the analysis commercially, but this laboratory informed us that it is not certified by the Department of Health Services (DHS) for this analysis. Further research indicates there is no DHS certification for this method. The draft permit language should be appropriately modified to remove the requirement that the SSC analysis be DHS certified. Also given the apparent unfamiliarity of the analysis to commercial laboratories the State Water Board should conduct additional research to ensure the support industry (i.e. commercial laboratories) can meet the need of the prescribed compliance sampling. Additionally, the State Board should provide a resource listing of laboratories in California known and qualified to perform the test.

The draft permit specifies that Risk Level 3 projects must conduct continuous monitoring at discharge locations where there is an NEL exceedance. However no details are provided on how continuous monitoring should be evaluated for continuing compliance. Additionally, it is not clear that continuous monitoring instrumentation is readily available for field deployment on construction sites where confined runoff conveyances may not be available. CASQA recommends eliminating the requirement for continuous monitoring.

The Fact Sheet states that the pH NEL only applies to sites that are working with concrete or other pH affecting materials (dry wall, mortar, etc.), however the MRP requires all sites to conduct pH monitoring. Are all sites to monitor pH but the NEL only applies as noted in the Fact Sheet? Does the pH NAL only apply to sites working with concrete or other pH affecting materials?

Discharge location for the purposes of effluent sampling needs to be better defined, when read in conjunction with the SWPPP requirements a "discharge location" could be every storm drainage inlet within a project site. During the workshops State Water Board staff indicated effluent sampling was at the property line. CASQA agrees with this and recommends that this interpretation be made clear in the Order, Fact Sheet, and MRP.

Section J.2 of the draft permit contains a turbidity method not listed in Table 5.

Sample collection and handling methods described in Section H are more in the nature of guidance than requirements and should be described as such. Not all dischargers will rely on laboratories to provide containers, labels, Chains of Custody, etc. CASQA recommends removing these guidance elements from the permit and including it in the training modules or other guidance materials.

Receiving water monitoring

Summary Comment

CASQA does not support receiving water monitoring by construction dischargers and recommends the deletion of this requirement. The utility of this monitoring for sites significantly removed from the receiving water is questionable. For the majority of construction sites, runoff discharges flow into public or private storm sewer systems and are commingled with runoff from large portions of watersheds, which may include discharges from open space, urban runoff, industrial sites, other construction sites, suburban runoff, and agricultural lands. For these sites there is no technically valid way to associate any effect noted in the receiving water with the discharges from the construction site.

Access and safety issues are also a significant factor in receiving water sampling. In most cases the receiving water will not be on the dischargers property; access to receiving waters on private property or on controlled public land (e.g. flood control channels) may be difficult to obtain. Many receiving waters in California have been engineered, and have restricted bank access. In Orange County, for example, the Santa Ana River is typically a large trapezoidal or rectangular channel. Access to the channel for sampling would require an encroachment permit from the County. The requirement to obtain an encroachment permit from the county for every sampling event, or even for each construction project would be burdensome both for the projects and entities required to issue the permits. In many areas, the only location where access to the channel is available is at freeway or street bridges over the channel. Receiving water samples would have to be taken by throwing a bucket with a rope over the rail, lowering it up to 50 feet, and hauling it back up for sampling.

Where receiving waters are on private property, access is at the discretion of the owners and could be revoked mid-project even if granted initially. Private property owners may not want the potential scrutiny that comes with water quality sampling or the liability of allowing access during inclement weather.

In certain limited circumstances, receiving water monitoring might be valuable for specific projects where the receiving water is within or directly adjacent to the project. On the whole, however, this type of monitoring would be better conducted by a defined state directed project, such as the Surface Water Ambient Monitoring Program (SWAMP) or as noted in our comments on NALs.

Comment Detail
If receiving water monitoring is maintained in the permit, CASQA recommends that the State Water Board limit and provide additional details on the types of receiving waters that should qualify for this type of monitoring (e.g., should dischargers monitor flood control basins or engineered flood control channels) and set distance limits beyond which a discharger should not sample (e.g., if runoff flows through more than 1000 feet of commingled storm sewers, monitoring is not required).

The draft permit specifies that Risk Level 2 projects conduct receiving water monitoring for all constituents for the duration of the construction project when there is an NEL exceedance. If this requirement is maintained, the requirement to conduct receiving water monitoring should only be limited to the parameter from which the NEL was exceeded and limited to the duration until the NEL exceedance is corrected.

Bioassessment monitoring

Summary Comment
CASQA recommends the deletion of the bioassessment monitoring requirement. The utility of this monitoring in the context of the construction general permit is absent. While there is no doubt that bioassessment monitoring has significant value is assessing the health of water bodies, there is limited connection of the need for this monitoring to all Risk Level 3 projects regardless of their location relative to the receiving water and the nature of the receiving waters to which the sites discharge. This appears to be a data gathering effort that is better suited to the SWAMP program than a condition of the construction general permit.

In certain limited circumstances, bioassessment monitoring might be valuable for specific projects where a sensitive natural (i.e. not hardened or engineered) receiving water is within a very large project. However this type of project is more likely to be Risk Level 4 and bioassessment monitoring might be a condition of the individual permit for such projects. On the whole, however, this type of monitoring would be better conducted by a defined state directed project, such as the SWAMP, funded by all dischargers within a watershed. It is difficult to imagine how bioassessment monitoring could be meaningfully incorporated into the operation of the site or the design of the site BMPs.

Comment Details

The draft permit directs dischargers to use the California Wadable Stream method for sampling of benthic macro invertebrate (BMI), but then directs them to the SWAMP Quality Assurance Management Plan for more information on sampling collection and analysis. These two documents describe different levels of effort (and therefore cost) for the bioassessment. Which method is required? The CA Wadable Stream method typically takes about two hours of field work for one biologist to perform sample collection, while the SWAMP method can take anywhere from four to six hours, with two or three biologists.

The draft permit also does not identify the level of analysis (identification) required for the macro invertebrate samples. There are two levels, Level 1 and Level 2, for which there is a large difference in the effort (and therefore cost). Level 1 identifies most insects to genera and Chironomidae to family. For level 1 analysis, the count for each sample is usually approximately 600 insects per sample. A 600-count sample would require roughly six hours of sorting and six hours of identification for one person. Level 2 analysis requires identification down to species (or lowest possible taxon for the specimen). For the Level 2 analysis (midges to genera, others to species), the fees for Level 2 identification are really dependent on different variables but it is typically very costly.

If maintained in the permit, CASQA recommends the bioassessment requirements be moved from the MRP to Section VIII, Project Planning Requirements.

Issue: Visual Monitoring/Inspections

Summary Comments

The BMP inspections identified in Section I of the permit are not included in the summary tables in the Fact Sheet or MRP. With the addition of these weekly and daily during storm event inspections, the visual monitoring/inspection requirements appear to be overly conservative. CASQA recommends that full list of required inspections be included in the summary tables for complete evaluation during the public comment period and ease of compliance during implementation.

Comment Details

Visual inspection requirements are noted in the Fact Sheet, Order Sections I and X, and the MRP. Section I of the draft permit identifies required weekly BMP inspection, and daily BMP inspections during extended storm events, Section X identifies REAP implementation requirements, some portions of which will be site inspections, and the MRP identifies pre- and post- rain event inspections.

Given that weekly inspections of BMPs are required for all risk levels, CASQA recommends the elimination of the pre-rain event inspections.

CASQA Recommended Visual Monitoring/Inspection Requirements by Risk Level

Risk Level 1 **Risk Level 2**	one inspection non-SW quarterly	weekly daily during extended rain events	~~one inspection within 48 hours of a qualifying rain event~~	one inspection within 2 days after a qualifying rain event
Risk Level 3			~~one inspection within 48 hours of a qualifying rain event, plus photograph~~	one inspection within 2 days after a qualifying rain event, plus photograph

The MRP does not define a qualifying event for visual inspections for pre- rain event inspections. If pre-rain event inspections are maintained, CASQA recommends using the REAP trigger these inspection, and recommends defining "qualifying event for pre- rain event" inspections in the glossary.

The Fact Sheet contains a graded trigger for post rain event inspections of within 2 days of a 1/2-inch event and within 1 day of a 1-inch event. This graded trigger is not in the MRP of the draft permit. CASQA believes this is an artifact from the preliminary draft permit language, and recommends deleting it.

The language in the MRP, items D1, D5, D7, and Table 2 are not consistent on the timing of visual inspections. Also it is not clear as to which type of inspection is referred to in D.5 in the Monitoring and Reporting Program (MRP) (Attachment B) of the draft permit.

The language in the Fact Sheet and the Order are not consistent regarding which project Risk Levels must photograph sites. The Fact Sheet text indicates all sites must photograph, while the Order and MRP requires this only of Risk Level 3 sites.

Issue: Risk Assessment and Risk Factor Worksheets

Summary Comment

CASQA supports a risk-based approach that assigns permit requirements based on the water quality risk posed by individual construction projects and recognizes that a risk-based approach is a better way to make a one-size fits all permit better suited to the diversity of construction activities requiring permit coverage. A risk based approach benefits regulators, dischargers, and the public by allowing the focus of resources on those projects that pose the greatest potential threat to water quality if not managed properly. The risk assessments are the foundation for the development of a site specific, well defined SWPPP, therefore are a critical new element of the construction permit and need to be technically sound and well tested.

Therefore as part of its review of the permit CASQA commissioned a review of the risk calculation methodology by Harlow Landphair and George Foster (see Attachment 3).

The assessment matrix is an improvement over that in the preliminary draft permit, but additional fine tuning is needed and beta testing should be conducted to assure that the matrix works and that is not weighted toward determining and undue numbers of projects are high risk.

Comment Details
Please see details in the Landphair and Foster Technical Memorandum, Attachment 3.

The Sediment Risk Work Sheet does not provide for incentives to dischargers to select less risky construction practices, e.g., size of disturbed area during rainy season. More incentives should be allowed for in the risk calculation, such as incorporation of the RUSLE C and P factors, which would directly relate the risk to the dischargers' choices in construction practices and BMPs.

Sediment Risk Work Sheet does not take the disturbed area into account. The Fact Sheet indicates that a project's area will be considered when determining the risk level. If this is an inadvertent omission, it should be rectified before the permit is finalized.

Receiving Water Work Sheet indicates that any project with a base score of less than 10 has a receiving water low risk rating, however the Work Sheet appears to require a baseline score of 10, making it impossible for any project to rate as low risk. CASQA recommends removing the base score assignment of 10 points to all projects.

Receiving Water Work Sheet, Item A.1 should include 303(d) listing for sediment or turbidity.

Receiving Water Work Sheet, Item B2, this factor does not make sense for project significantly removed from the receiving water or where the receiving water is not a stream (e.g., discharge to a bay or ocean), or where the stream is an engineered channel. Additional guidance and information are needed for dischargers to complete the channel stability risk factor assessment.

Receiving Water Work Sheet, Items B1 and B3, it is unclear what is meant by sensitive receiving water. CASQA suggests this be defined as a water body on the 303d list for sediment related pollutants.

Receiving Water Work Sheet, Item B.4, this factor seems more appropriate for the Sediment Risk Work Sheet. Also, the credit is only available if all runoff from the project is treated. Typically only disturbed areas are treated through an ATS; otherwise the sizes of the systems become too large to effectively implement on a construction site.

Additional guidance is needed on how to apply the risk assessment for redevelopment projects.

Similar to the hydromodification requirements, the risk assessment presents difficulties for ongoing projects that will need to comply with the new requirements after construction has commenced. CASQA therefore strongly recommends that the State Water Board establish a phase-in period for the risk assessment requirement and suggest the following approach to avoid

the complications that will result as dischargers and Regional Boards attempt to determine the Risk Levels and the possibility of permit coverage being revoked for these of underway projects.

- Projects that are currently in construction (in the grading and land development or utilities phases) permitted under Order 99-08-DWQ, are exempt from the risk assessment requirement and shall follow Risk Level 2 project requirements.

- Projects that are currently in construction (in the vertical construction phase) permitted under Order 99-08-DWQ, are exempt from the risk assessment requirement and shall follow Risk Level 1 project requirements.

- Projects that are currently in construction (in multiple phases i.e., some parts of the project are being graded while others are in the vertical construction) permitted under Order 99-08-DWQ, are exempt from the risk assessment requirement and shall follow the Risk Level 1 or 2 requirements as noted above for each distinct phase.

Issue: Implementation of New Requirements

Summary Comment
CASQA is concerned with the time allowed for projects currently permitted to redesign SWPPPs, monitoring programs, obtain qualified personnel to develop and implement SWPPP. Given an optimistic schedule, the permit would be adopted in the late summer, and with the 100 day review period, dischargers would be faced with changing permits just as the 2008/2009 rainy season got underway. CASQA strongly recommends establishing and adopting an implementation date in the permit to coincide with the 2009/2010 rainy season. In addition to allowing existing dischargers time to redesign their compliance approach and documentation, and provide time for training of personnel on permit requirements, projects that are on the cusp of going into construction that have planned for compliance with 99-08-DWQ, will be afforded similar planning time. The implementation delay would also better coincide with the QSD and QSP training under development by the State Water Board with the assistance of a stakeholder group, and with the revision of the CASQA Construction BMP Handbook, both of which will be instrumental for dischargers in complying with the new requirements.

Issue: Linear Construction
The construction general permit is written for traditional "box" construction projects. The differences between linear and traditional construction are sufficiently great that requiring both types of projects to be covered under the same permit results in burdensome requirements. The state recognized that it was inappropriate to regulate linear projects under the construction general permit, and issues a permit for small linear projects (1-5 acres). CASQA supports the utility industry's request to update the linear construction permit to include large linear construction projects. However, the discretion afforded to dischargers in the current permit to select either the general construction permit or the linear construction permit for their projects should be maintained.

Issue: Permit Registration Documents

CASQA supports the changes in the language on the submission of the permit registration documents lowering the advance submission to 14 days, and the administrative acceptance of the documents without a full qualitative analysis of them. CASQA remains concerned about the process for public review and how Regional Water Boards will manage comments and requests for public hearings and recommends that this process be better defined in the permit Fact Sheet or supporting guidance.

Issue: Maintenance Definition

Summary Comment
The draft permit Fact Sheet included a clarification of the maintenance exemption that complicates the understanding of how this exemption is to be applied. USEPA and the State Water Board previously issued guidance in the form of Fact Sheets and FAQs on this issue. CASQA recommends that these existing documents be referred to rather attempt revise the definition in the permit's Fact Sheet.

Comment Details
The description of maintenance activity in the Fact Sheet, copied here, raises several questions.

Construction activity subject to this General Permit includes any construction or demolition activity, clearing, grading, grubbing, or excavation or any other activity that results in a land disturbance... As used above, routine maintenance only applies to road shoulder work, dirt or gravel road re-grading, or ditch clean-outs. For municipal operators, repaving of asphalt roads is routine maintenance except where the underlying and/or surrounding soil is cleared, graded, or excavated as part of the repaving operation. Where clearing, grading, or excavating of underlying soil takes place, permit coverage is required if more than one acre is disturbed or part of a larger plan or if the activity is part of more activities part of a municipality's Capital Improvement Project Plan.

The definition appears to apply several limitations on the application of the exemption:

- *Routine maintenance only applies* to road shoulder work, dirt or gravel road re-grading, or ditch clean-outs, however CASQA notes that many routine maintenance activities occur in other that road locations, for example landscape maintenance and parking lot maintenance. These maintenance projects should not be precluded from using the exemption.
- *For municipal operators, repaving of asphalt roads is routine maintenance*, however CASQA notes that there are numerous other organizations and private entities that maintain roads as described. These entities and organizations should not be precluded from using the exemption.

Issue: Capital Improvement Plans

Summary Comment
Included in the discussion of the routine maintenance exemption, is a reference to Capital Improvement Project Plans that is very unclear and seems out of place in the context of routine

maintenance. CASQA recommends the reference be deleted or clarified. The language appears to suggest that projects of any size that are part of a Capital Improvement Project Plan are subject to the permit requirements. CASQA is opposed to a redefinition of common plans of development that include planning documents. Capital Improvement Plans and other planning documents such as master plans or redevelopment plans identify work that may or may not be funded in the future and are inappropriate to consider a common plan of development.

Comment Details
Absent clear regulatory or statutory language on common plans of development, especially for public sector projects (which may include municipal, state, federal, or institution projects) most dischargers have created interpretations that look to the environmental review documentation, contractual documentation, funding sources to define projects and common plans of development. Should it be necessary to further define common plan of development CASQA suggests the following.

> Common Plan of Development:
> In this General Permit, a Common Plan of Development is generally a contiguous area where multiple, distinct construction activities may be taking place at different times under one plan. A plan is generally defined as any piece of documentation or physical demarcation that indicates that construction activities may occur on a common plot. Such documentation could consist of a tract map, parcel map, demolition plans, grading plans or contract documents. Any of these documents could delineate the boundaries of a common plan area. However, broad planning document, such as land use master plans, conceptual master plans, broad-based CEQA or NEPA documents that identify potential projects for an agency or facility are not considered common plans of development.

Issue: Legally Responsible Person (LRP)

The language in Order 99-08-DWQ is derived from the Clean Water Act language that allows an owner or operator to certify permit required documents and to delegate this authority in accordance with the corporate policy or agency rules to appropriate individuals, including those individuals responsible for compliance such as a construction manager.

The revised definition presents several challenges for public and private projects, especially for projects conducted on land with long-term leases, projects conducted by municipalities, and project conducted on federal facilities, which are usually subject to long-term contracts under which the contactor is responsible. These legal relationships (contracts, leases) usually transfer compliance responsibility to the "operator" of the project and it would not be appropriate for the landowner to be involved in the certifications.

Issue: Permit for non-jurisdictional waters
It is unclear why the permit applicability has been limited to discharges to jurisdictional waters (as determined by the US Army Corps of Engineers). Order 99-08-DWQ does not make this distinction and equally protect waters of the US and waters of the State. CASQA recommends that this statement be deleted or further explained if the intent is to only permit discharges to waters of the US.

Issue: Rain Event Action Plans

Summary Comment

CASQA appreciates the changes to the REAP requirement, which clarify intent of the REAP and its relationship in context of the SWPPP.

Comment Details

Section X.2, of the draft permit states the "discharger shall develop a REAP 48 hours prior to any likely precipitation event." Given that the REAP is a project stage based check list that is created with the SWPPP, CASQA recommends the word "develop" be changed to "implement."

Section X.5, of the draft permit states that "All REAPs shall be prepared and certified by a QSP." Given that the word certify has very specific meaning in context of the construction general permit, the word "certify" should be changed or further clarified in context of the REAP to indicate that an LRP or authorized individual certification is not required in this case. LRPs are unlikely to be QSPs or QSDs.

Attachment G only contained the REAP for the Grading and Land Development. The example REAPs for the other stages should be included in the draft permit.

Additionally, the stakeholder suggested REAPs were two-page documents. Significant effort went into ensuring the two-page format to facilitate ease of use by site stormwater managers. CASQA recommends using the two page REAP format, which would allow the REAP to be laminated for field use and used a pre-event check-list.

The draft permit states development (implementation) of REAP is needed "within 48 hours prior to any likely precipitation event", then later states 50% or greater forecast of precipitation in the project area. The term "Likely" in NOAA table is 60-70% chance. CASQA recommends implementation of the REAP for 60-70% chance events.

The language in the Fact Sheet and order are inconsistent regarding the Risk Level of projects that must implement REAPs. Section X.1, of the draft permit states REAPs are not required for Risk Level 1 projects, however the Fact Sheet indicates all project must develop REAPs. CASQA recommends limiting the REAP to Risk Level 2 and 3 projects. Alternatively, as discussed during the stakeholder process, Risk Level 1 projects might be simply required to have REAPs and not develop full SWPPPs.

Issue: SWPPP Requirements

SWPPP amendments

Section IX.2, of the draft permit states that the SWPPP shall be written and amended, as needed, to address the specific circumstances for each construction site covered by this General Permit prior to commencement of construction activity for any stage. It is unclear whether amendments/updates to the SWPPP trigger submittal of the revised document through the electronic system. CASQA recommends that additional guidance be provided on the level of amendment or update of a SWPPP that would trigger electronic resubmission.

Non-stormwater discharges
The draft permit states that discharges may include non-chlorinated discharges of potable water. In most communities, potable water is chlorinated. Was the intent to require potable water discharges to be dechlorinated? Rather than non-chlorinated, CASQA suggested the term de-chlorinated, which is the more commonly used term.

Site Map/Unauthorized non-stormwater discharges
Attachment H, 2.f.viii, of the draft permit indicates unauthorized non-stormwater discharges be shown on the site map. As these unauthorized discharges are one time unexpected events it is not practical to show them on the site map.

Issue: Final Stabilization requirement

Summary Comment
The conditions for final stabilization are unlikely to be achieved in a time period reasonable to the "end of construction activities", unless all final stabilization is achieved through the use of non-native grass sod. The buildup of two-inches of plant litter will take several growing seasons and in some climates may never be achieved, e.g. desert or mountain scrub regions do not have much interplant litter. In many areas the accumulation of dead plant litter is likely to be contrary to fire prevention/control requirements, which require the removal of dead plant materials. CASQA recommends the revision of the final stabilization requirement.

Comment Details
See comments contained in the Landphair and Foster Technical Memorandum (Attachment 3)

CASQA Comments on the March 2008 Draft Construction Stormwater Permit
Attachment 2

Technology Based Effluent Limits and Water Quality Based Effluent Limits

CASQA Comments on the March 2008 Draft Construction Stormwater Permit
Attachment 3

Technical Memorandum prepared by Harlow C. Landphair and George R. Foster

CASQA Comments on the March 2008 Draft Construction Stormwater Permit
Attachment 4

CASQA Comments on the March 2007 Preliminary Draft Construction Permit

Technical Memorandum

California Tentative Order (TO) for State General Construction Permit for Stormwater Discharges from Construction Sites (CGP)
This memorandum comments on three specific areas of the TO for the New CGP

1. Attachment "A" Risk calculation Excel spreadsheet
2. Attachment "C" Turbidity instructions and Turbidity Calculation Excel spreadsheet.
3. ATS requirements

Harlow C Landphair, Senior Research Scientist, Texas Transportation Institute, Retired
George R. Foster, Research Scientist, USDA, Agricultural Research Service, Retired.

1. General Comments on Technical Order

1.1 Attachment B: Monitoring Program and Reporting Requirements

1. While we agree that the monitoring of turbidity, pH, and suspended sediments a better means of determining project stormwater quality compliance, the results based on the guidance in this document will likely lead to great disparity in data. Grab sampling alone will result in great variation in sample quality and from years of experience in sampling surface and channel stormwater runoff we are certain that these methods will not likely provide a valid measure of performance. While it will a better measure of compliance, variation in storm intensity, duration, soil condition, stage of revegetation, and numerous other variables will impact the apparent water quality of the tests. It is hoped that these deficiencies are recognized and that it is understood that trying to get representative samples on a construction site during a runoff event is not only difficult but prone to great variability. Therefore it is usually necessary to look at multiple events to get full picture of performance.
2. Performance beyond the use for site BMP effectiveness assessment should be based on supervised standardized flow rated sampling techniques with handling and processing of samples by certified laboratories.

1.2 Post Construction Performance: New Development and Re-development Storm Water Performance Standards (i.e., Runoff Reduction Requirements

1. We believe that mixing post construction performance issues with the construction period management of stormwater is inappropriate. While the post construction hydraulic and hydrologic performance of a project is a valid regulatory concern this should be handled in the project permitting process not the construction permitting process. Clearly permanent stormwater management practices may be installed and utilized as part of the SWPPP but their long-term impact should be considered elsewhere.

1.3 Permit Section VIII. B. Erosion Control. 3

This section states: "For Risk Level 3, the discharger shall provide cover for all disturbed, inactive areas of construction equivalent to RUSLE "C Factor" of 0.003." We do not see how this requirement can be met in principal or in fact. Figure 1 is a table from NRCS NEH publication developed by Wischmeier and Smith.

1.3.1 Technical Discussion of *C*

First the *C* values are only for "*Established Plants*", not disturbed sites. Secondly the conditions that produce a *C* value of 0.003 are for established tall grasses at 25 to 50% cover with 95% or greater surface cover of residue (thatch matt developed from dead vegetation). Note that the *C* increases as tall grass cover increases. This is attributed to the average 20% drop height.

Table 3.7
Cover Factor C Values for Established Plants
(data from NRCS NEH Chapter 3 and Wischmeier and Smith 1978)

			Percentage of surface covered by residue in contact with the soil					
	Percent Cover[1]	Plant Type	0%	20	40	60	80	95+
C factor for grass, grasslike plants, or decaying compacted plant litter	0	Grass	0.45	0.20	0.10	0.042	0.013	0.0003
C factor for broadleaf herbaceous plants (including most weeds with little lateral root networks), or un-decayed residues	0	Weeds	0.45	0.24	0.15	0.091	0.043	0.011
Tall weeds or short brush with average drop height[2] of =20 inches	25	Grass	0.36	0.17	0.09	0.038	0.013	0.003
		Weeds	0.36	0.20	0.13	0.083	0.041	0.011
	50	Grass	0.26	0.13	0.07	0.035	0.012	0.003
		Weeds	0.26	0.16	0.11	0.076	0.039	0.011
	75	Grass	0.17	0.12	0.09	0.068	0.038	0.011
		Weeds	0.17	0.12	0.09	0.068	0.038	0.011
Mechanically prepared sites, with no live vegetation and no topsoil, and no litter mixed in.	0	None	0.94	0.44	0.30	0.20	0.10	Not given

[1] Percent cover is the portion of the total area surface that would be hidden from view by canopy if looking straight downward.
[2] Drop height is the average fall height of water drops falling from the canopy to the ground.

Figure 1: Table of C Values for Established Plants

In our erosion control testing program at the Texas Transportation Institute, Hydraulics and Erosion Control Laboratory in College Station, TX, we have been testing the performance of all types of temporary erosion control products since 1990. These are uniform tests that compare the material sediment retention performance to soil loss on cohesive and non-cohesive soils. During this time we have never found a temporary product, physical or chemical that would yield a *C* value this low.

Because the testing program is focused on the transportation environment our standard tests are for slopes of 3:1 (33%) and 2:1 (50%) which are common on many transportation projects. The performance levels established for approval of a material are given in Table 1.

Table 1 TxDOT/TTI Maximum Allowable Sediment Loss by Slope and Soil Type

Slope and Soil Type	Maximum Allowable Loss in Tons/Acre
2:1 Cohesive	1.72
3:1 Non-cohesive	62
2:1 Cohesive	4.07

3:1Non-cohesive	137

These values in Table 1 were established using 5 years of testing data and using the upper 80th percentile of performance to establish minimum performance levels. This every two years these limits are reevaluated and have been reaffirmed over more than 17 years of testing.

Because straw is one of the most common and effective surface protection techniques summary data sheets have been attached that show the evaluation of straw performance using the standard TTI protocol.

1.3.2 Conclusion

Based on our experience and these data we believe that using the *C*=0.003 value as a requirement for disturbed soils is an inappropriate measure altogether. Clearly the RUSLE "Cover Factor" is strongly influenced by both slope, slope length' and soil characteristics that are never uniform across a site. And, since no single temporary erosion control product will perform at that level the requirement is of little value and probably cannot be measured if enforcement actions were attempted.

Erosion control on a construction site must be considered as a system not as a single management practice. Early in the revegetation process sediment yields from newly stabilized areas will be high, which requires backup sediment controls downslope. Then as germination and establishment of vegetation proceeds the sediment controls will have less loading. Depending on the type of vegetation, slope and soil it will require between 2 and 5 years to establish a surface cover system that would perform consistently at a *C* value of 0.003.

In some areas of the state, particularly in arid desert shrub associations, a C value of 0.003 could never realistically be expected. The measure of compliance that will best measure/monitor the sediment control of a site is the turbidity requirement.

2. Risk Calculation Methodology (Excel Spreadsheet)

1. The use of the TAMU website certainly simplifies the process but it needs further explanation for what it does and how to use it. The term erosion index needs better definition. If the graphic county function is used the sheet often returns R=0.
2. K factors can be a weakness particularly on projects where the substrate soils are exposed, The K values given for sites in the WSS are surface soils.
3. The Slope Length Factor (LS) is a major problem. The Revised Universal Soil Loss Equation (RUSLE) is a model that predicts slope erosion. As used in this spreadsheet it requires selecting a single LS value to characterize the whole site. On a large complex project trying to characterize LS with a single value is not really possible because erosion, transport and deposition depend so much on location and surface hydraulics. The new RUSLE2 program does have a profile routine that allows the entry of complex

slopes and different soil compositions. However, this routine would represent only one section trough the site. While it might be a better characterization of the conditions it still might not represent the real erosion hazard well. On the other hand the Water Erosion Prediction Program (WEPP) provides a means to integrate multiple slope profiles within a single drainage basin and could be a more appropriate tool for this application.

4. As used the "Sediment" portion of the spreadsheet gives the predicted erosion rate t/ac/yr with no cover or management practices in place. The logic for where the risk lines are drawn seems somewhat arbitrary.
5. The entire risk matrix seems to be weighted so that a many projects will result in a risk level 3 ranking which has very detailed monitoring requirements that are going to be very difficult for some smaller projects to administer and will likely result in poor data and enforcement burdens.
6. The other portions of the sheet: "Channel Stability Index Ranking" and "Receiving Water" are subjective, and many of the variables do not appear to have sufficient clear definitions and guidance for application. The lack of strong accepted definitions and guidance will doubtless result in a great variability and controversy in choosing the values. While we understand that this is an effort to bring more structure to the permitting process it is virtually impossible to develop a one size fits all scoring that will characterize any natural system(s), and it would likely not be applicable to many engineered systems.
7. After running several hypothetical projects through the scoring process it does appear that if a site is on moderate slopes and does not discharge directly to a water body or a 303(d) listed body that they will be Level 2 rankings. However, any combination of steeper slopes with direct discharge to an established named drainage course will result in a Level 3 Risk ranking.

3. Turbidity Estimation (Excel Spreadsheet)

1. We have unsuccessfully tried to use MUSLE to predict the sediment yields from highway sites as opposed to range lands or larger drainage basins. Likewise resent research in the U.S. and internationally seem to suggest that the model needs more localized calibration such as the regression models used to adjust the results of the widely used TP-40[1] rainfall depth model. It would seem that MUSLE is currently the simplest available model for estimating an event based sediment yield but if it is to be the basis for estimating and setting NELs then more detailed research is needed to further calibrate the model and conversions.

1. _____

[1] www.erh.noaa.gov/er/hq/Tp40s.htm

2. The Loading Factors portion of the sheet uses sheet flow rather than overland flow. The NRCS/SCS has, for some time, been recommending that no sheet flow length over 300 ft be used in any calculation whether TR-55 or other models. They suggest that after 300ft the flow will become concentrated in small rills which can no longer be characterized as sheet flow.

4. Active Treatment System (ATS)

1. Passive systems using only gravity have been shown to provide very good levels of removal if properly managed. In our recent study of simple extended detention structures achieved 75% removal of fine sediments of 5μm and less over a 24 hour period. In this work it was determined that approximately 80% of the particles that were discharged were from resuspension of materials previously trapped (Landphair, Barrett et al). The study has continued looking at refinements to the inlet to the structure which has increased the efficiency to over 80% removal in 24 hours at considerably less expense than an ATS
2. The use of ATS should certainly be pursued for high risk sites and polymers seem to be the most promising of all the chemical additives. While some polymers are indeed toxic there are many other compounds that can be used with good success well below any level of toxicity to aquatic life. McLaughlin et al 2005.
3. Research has demonstrated that when using polymers for sediment control that they should be specially formulated for the specific soil(s) of the site. Barrett, Molina, Charbeneau, et al 95, McLaughlin et al, 2005.

5. XI Conditions for Termination of Coverage, 3. a, Footnote 12

The footnote recognizes that vegetation cover in certain arid areas will never reach 70% surface cover. On the other hand, the footnote requires that the soil be completely covered with a plant litter (thatch) layer of 2 in. A 2in thatch layer may take as many as 5 to 10 years to develop and in some conditions may never occur. Many arid locations rely on a lichen or bacterial crust to stabilize the surface and this can take decades to reestablish if ever. This requirement needs to be administered on the basis of the properties of the adjacent vegetations surface cover system. That is, the overall system of how the native vegetation works together with the soil, soil chemistry, and climatic factors to stabilize the surface.

6. Comments from George R. Foster April 29, 2008

1. George R. Forster is retired from the USDA Agriculture Research Service (ARS). His career focus has been on the development, refinement and application of the RUSLE, and the most recent computerized version RUSLE 2. For this reason I had requested George

to also provide comments regarding the use and application of RUSLE technology in the Draft Permit. George was a primary author and coordinator of the 1997 seminal publication *Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE), United States Department of Agriculture, Agricultural Research Service, Agriculture Handbook Number 703, July 1996.* He has numerous other publications and credits related to the development and use of both RUSLE and RUSLE 2.

2. The description of the overall logic, objectives, and erosion and sediment control principles is well done. However, the technical procedures are not state of the art. The stated procedures need additional consideration and are erroneous in some cases.

3. The Revised Universal Soil Loss Equation (Version 2) (RUSLE2) is state of the art erosion prediction technology specifically designed for the applications described in the permit document. It is much more powerful than the procedures described in the document. Therefore, the document should allow use of RUSLE2.
4. In conjunction with RUSLE2, an improved approach would be establishment of erosion/sediment control limits in terms of sediment loss per unit area or sediment loss from the project. These values would be set based on local site conditions. A worksheet similar to Attachment F could be developed to that would be used to assign these allowable loss values. In fact, one of the spreadsheets in the material that I reviewed included categories of erosion severity. Two types of erosion and sediment control are needed. On-site erosion control is needed to protect the soil resource in order to establish and maintain vegetation and to prevent rills and gullies, which makes vehicular traffic, such as mowing, difficult. Also, excessive erosion that causes rills and gullies can expose undesirable materials in waste disposal sites. My recommendations for on-site erosion control are given in the tables above. The other type of control is control of sediment leaving the site. The allowable sediment control values are determined by site specific conditions including impact on water quality and harm to protected species. The assignment of allowable sediment delivery values is dependent on the ease and costs of

On-site erosion hazard (risk): Erosion control needed to establish and maintain temporary and long term vegetation and to maintain site (no rills and gullies)

Average annual erosion rate (tons/acre)	Erosion hazard (risk)	Comments
<background erosion	None	Make sure site can be maintained over long terms: no rills or gullies
<0.5	None	
<T (soil loss tolerance)	Allowable	Erosion less than T for long term productivity maintenance
<7	Acceptable	Prevents rill and gullies
5-30	Medium	Requires moderate erosion control measures
30-100	High	Requires high level of erosion control
100-500	Very high	Requires intense level of erosion control
>500	Extremely high	Requires very intense level of erosion control along with diversions/terraces and possible topographic modification

Sediment control to prevent excessive off-site sediment delivery: must be based on the impact that sediment has on downstream environment (protected species), water quality and water conveyence and storage structures

Occurrence interval	Sediment amount or turbidity level	Comments
Storm event		Maximum allowable from any signle event with a given return interval
Annual amount in any one year		Maximum that can be tolerated over any single year (maybe greater than long term average annual value)
Average annual amount		Maximum that can be tolerated over the design life of completed project (Usually less than or equal background amount

repairing sediment-caused damages. For example, a drainage ditch filled with sediment can be repaired by cleaning and disposal of the deposited sediment. Inundation of a fish spawning bed may be near impossible and very costly if possible.

5. Rather than "sheet flow," use "overland flow." Very little sheet flow occurs on overland flow areas. Even when no rill erosion occurs, the flow is not sheet flow because of surface irregularities.

6. The document requires that inactive areas be 100 percent covered. That criteria needs revision. The widely used 4000 lbs/acre straw mulch rate covers 91 percent of the soil surface, not a 100 percent. Over time, the mulch decomposes which reduces cover. The rate of cover loss varies by location. For example, cover loss is significantly greater at Eureka than at Bakersfield. Similarly, cover is loss over time with roll products (erosion control blankets). A better approach is to require a particular level of erosion control and then allow the planner determine how to meet the erosion control criteria.

7. The vegetation requirement for final stabilization needs revision. The stated requirement is that 70 percent of the soil surface be covered by live, actively growing plant matter in contact with the soil. Do you mean that 70 percent of the soil surface will be covered by live plant material, all in contact with the soil surface? That expectation is not realistic. Or do you mean that the canopy cover is 70 percent with an unspecified in-contact ground cover percent. The requirement is that the area outside of the plant cover, which seems to be canopy cover, will be covered by plant litter and standing dead plant litter. If the vegetation is shrubs, the inter-plant area may not have litter cover. All of the litter cover will be under the shrubs. The expectation for a 100 percent cover after the second growing season is too optimistic for certain vegetation in certain climates. Plants vary greatly in their effectiveness for controlling erosion. Once again, the better approach is to require the planner to meet a particular erosion control criteria.

8. The document requires buffer strips, which is good. Specifications should be given for the buffer strips to avoid runoff flowing along the upper edge of the strip rather than through the strip. Also, the vegetation should be sufficient dense and uniform so that

runoff does not flow through in the strip in isolated locations as concentrated flow. Also, the vegetation should be able to withstand inundation by deposition and it should be sufficiently stiff that it is not bent over by the runoff. If these conditions are met, the buffer strip can be credited with trapping significant sediment. The grass illustrated in the figures below is sufficient to induce significant deposition, although this grass is not effective in concentrated flow areas.

9. The document requires linear erosion controls to prevent excessively long overland flow paths. These critical overland flow path lengths vary with location and cover-management conditions. These critical path length values can be computed with RUSLE2.

10. The document requires linear erosion controls at slope breaks. Using these controls to eliminate runon to steep slope segment is highly appropriate. However, why are linear erosion controls required at the toe of slopes? Instead overland flow should be allowed to flow on to flat slope segments that cause much deposition as illustrated in the figures below.

11. Vegetation is required for long term erosion control. A requirement should be that a high quality soil is placed on the last soil lift to promote both temporary and long term vegetation. Often times a toxic soil can be left on a land fill that prevents sufficient quality vegetation from developing.

12. The document should mention the use of temporary vegetation and how it can be used for erosion control before the permanent vegetation becomes sufficiently well established.

13. Gravel mulch should be mentioned as an erosion control alternative where vegetation can not be maintained.

14. The next set of comments are specific to the Attachment F: Sediment Transport Risk Worksheet

    a. The intent of this worksheet is not clear. Is it a worksheet that estimates the likelihood that whatever sediment, regardless of amount, that is eroded on-site will be transported to a receiving water body? Apparently the worksheet can be used to determine whether erosion control is needed. What is the tool that helps the planner determine the erosion control that will be installed? Is the worksheet essentially giving a sediment delivery ratio that will be used in conjunction with a sediment production computation to estimate sediment delivery in terms of an absolute amount to the water body? Or, is the worksheet estimating sediment delivery by computing sediment delivery amount. The idea of risk is not clear. Why not compute an expected sediment delivery amount and then apply erosion and sediment control to control sediment delivery to an allowable level?
    b. The proximity to receiving water topic needs additional consideration. If the source area is directly connected to the receiving water body, a value of 50 is

assigned regardless of the amount of sediment produced. A better approach would be to compute a sediment production value and use the proximity to stream index as a sediment delivery ratio multiplier. Also, increased detail of the intervening area between the source area and the direct connecting path and sediment transport characteristics along the sediment transport path is needed. Consider Figures 1 and 2 below. These photographs are of a construction site after placement of fill and grading. Note that overland flow runoff flows along a relatively long, flat area, then across a short steep area, then on to a flat area that is well covered with grass, and then into a channel that carries storm runoff into a perennial stream about a ¼ mile away. Note the high amount of deposition that is caused by the low steepness that is grass covered between the erosion area and the channel that collects the overland land flow. As much as 80 percent of the sediment that was eroded on this site never left the site because of this deposition. The permit procedure should take into account the likelihood of deposition between the erosional areas and the point that the sediment leaves the site. A multiplier involving perhaps four classes is more appropriate than the additive factor of either 0 or 50.

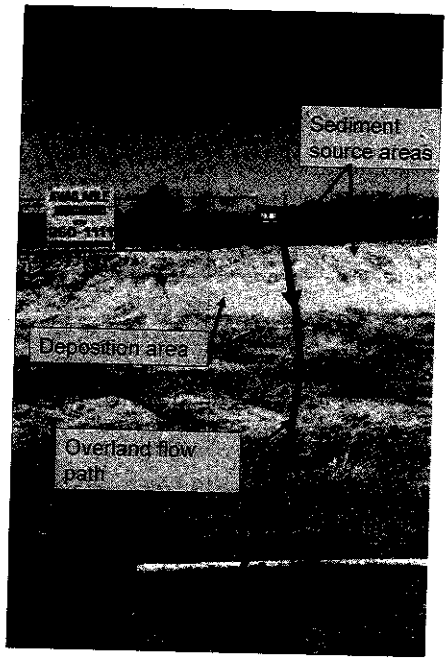

Figure 1. Local erosion and deposition at a construction site

c. The question "Will the site be cleared and graded outside of the designated rainy seasons and will Erosivity Index R be less than 5?" is unclear? Must both of these conditions be met for a 0 score. If R is less than 5, does the time of clearing and grading make a difference in assigning an index value? Why not ask the question in terms of the R value for the period that the site is susceptible to erosion. If the R for this period is less than 5, then assign a value of 0. Otherwise assign a multiplier value related to the factor of the total annual R during which the site is susceptible to erosion.

d. The erodibility index is not properly constructed. The erodibility index should not use the T value. Soil loss tolerance T is the allowable soil loss so that cropland will maintain productivity for an extended period. It has little relationship to the rate that soils erode or to the impact that sediment has on water quality and sedimentation. Furthermore the NRCS assigned T values do not relate to the disturbed soil conditions associated with construction site conditions. To illustrate the problem, a deep soil that is not easily damaged by erosion has a T value of 5 tons/acre per year, whereas a fragile soil may have a T value of 2, a

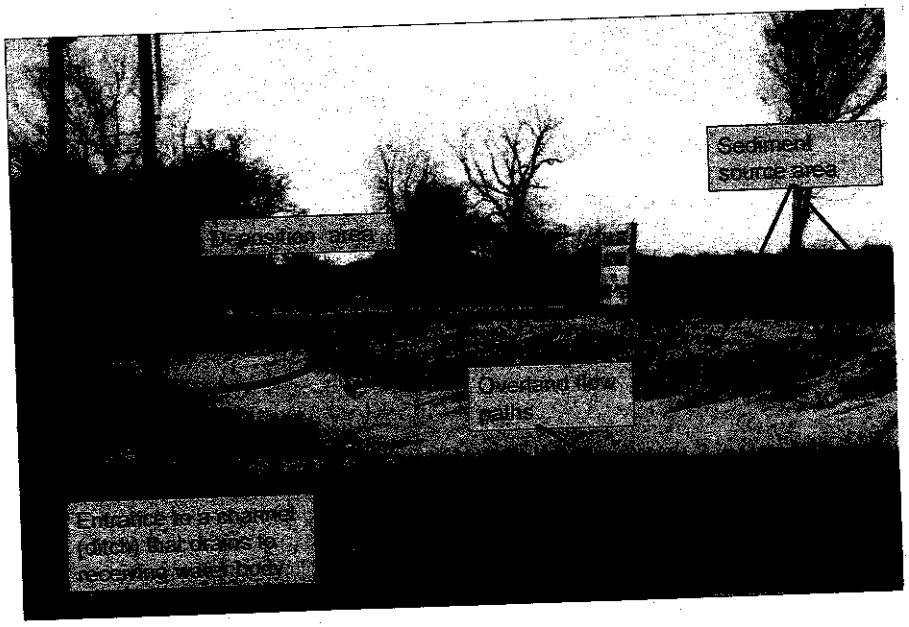

Figure 2. Local erosion and deposition and delivery to a ditch that drains to an offsite water body.

factor of 2.5 difference. Yet both of these soils could have the same K (soil erodibility factor) value. Consequently, the assigned points value for the soil erodibility index range could be 0 for one soil and 100 for the other soil when the points values should be the same from a water quality/sedimentation downstream impact because both soils produce the same amount of sediment.

e. The Internet site address for R values does not work. These values should be reviewed. These values should be based on RUSLE2 R values, which were derived from a recent analysis of precipitation data. The RUSLE2 R values represent by far the best R values that are available, especially for the Western US, including California.

f. **The NRCS K values reported in soil survey documents do not apply to construction site soils, especially ones where the profile has been disturbed.** The K factor nomograph included in the document is not accurate in comparison to the standard soil erodibility nomograph originally given in Agriculture Handbook 537 and especially in relation to the modified soil erodibility nomograph developed for RUSLE2. The adjustment values for organic matter give inaccurate K values. For disturbed soils involved in construction activities, a 0.5 percent organic matter should be assumed for all soils. The permeability code should be included as an adjustment factor, and in fact is more important than organic matter content for construction soils. The adjustment for rock content is even more erroneous. A soil having a 75 rock content by volume is hard to imagine. The proper way to handle rock content is to estimate how rock in the soil affects the permeability rating for the soil is using the RUSLE2 soil erodibility nomograph and use that estimate to adjust the base K value for the permeability effect. The second step in considering rock is to estimate the percent

of the soil surface that the surface rock covers. That value is entered into a curve or table to get an adjustment factor. **However, this K value should not be used to make erosion computations when other cover is present.** RUSLE2 properly handles the mathematics of rock cover, which **the NRCS adjustment procedure does not**.

g. The description of assigning points values as related to overland flow path length is unclear. The shortest overland flow path is zero on hillslopes with natural drainage patterns. Thus, the points assigned for a hillslope with natural drainage patterns will always be less than 100, which is not the desired result. The 8 value in effect is an allowable erosion value. Get rid of the T value in the computation. Change the 8 to a value that you desire. The 8 value seems to have come from NRCS rating for cropland where maintenance of productivity is the critical concern. The RKLS computation is a soil loss computation assuming that C and P =1. The highest T value for cropland is 5 tons/acre, which means that the RKLS value is 40 tons/acre for an allowable erosion without erosion control. The assumption is that farmers will need to apply erosion control that has a CP value less than 0.13 to meet erosion control criteria of 5 tons/acre. The 0.13 is considered to be a reasonable value that farmers can meet with modern erosion control technology. This erodibility index RKLS/T is not applicable for construction site conditions, other than protecting the on-site soil. It is not applicable for sediment delivery considerations. What is the highest average annual erosion that the local condition can tolerate assuming that all of the sediment produced is delivered to a water body? The RKLS product should be compared against this value and points assigned on that basis.

h. A better approach that taking RKLS values for minimum and maximum LS values is to divide the site into about four subareas. Compute RKLS for each subarea and then compute a weighted average based on the fraction of each subarea. Do not multiply an average K value and an average LS value for the entire and then multiply these values. Also, non-uniform slope steepness should be considered in computing LS, especially when slopes are convex-shaped. Assuming a uniform slope can significantly under estimate erosion for convex slopes.

i. The reason that runoff potential is considered is not clear. Certainly runoff rate and amount affect the likelihood of sediment transport. Runoff is related to soil runoff potential. In addition, runoff is related to rainfall at the site. Thus, an index of rainfall is needed if runoff potential is to be considered. Furthermore, sediment transport potential is also related to slope steepness, especially in areas where deposition may occur. Assigning points for runoff potential should be deleted. The effects captured in this index are already captured in the RKLS computation, unless some effort is being made to estimate deposition. In that case the points assignment procedure is not structured correctly to capture deposition.

j. The sediment basin sizing criteria discussed in Attachment H may not properly consider sediment properties depending on the procedures used to determine sediment properties. The ASTM procedure mentioned in the document does not appear to properly represent sediment sizes and density at the sediment actually occurs. Sediment eroded from cohesive soils typical of most construction sites is

a mixture of aggregates and primary particles. The aggregates are larger than the primary particles making up the aggregates. Soil testing procedures that disperse the soil to determine size produces very inaccurate data on sediment properties. Also, the sediment basin sizing procedure does not take into account upstream deposition that can greatly change sediment characteristics resulting in sediment basins below depositional areas having significantly reduced effectiveness.

15. In one of the documents, the statement is made "For Risk Level 3, the discharger shall provide cover for all disturbed, inactive areas of construction equivalent to RUSLE "C Factor" of 0.003." What is the basis of the 0.003 C factor value? Under what conditions do you expect a 0.003 value to be achieved? Such a low C factor seems very unreasonable. At 4000 lbs/acre straw mulch provides a C factor of about 0.10. The C factor for almost all vegetation in the first year will be much larger than 0.003 even if irrigated. Even long term permanent vegetation won't provide a C factor much lower than 0.10 depending on the local climate in most relatively dry areas.

16. One of the documents mentions using a C = 0.5 and P = 0.1 in a turbidity computation with MUSLE. What is the basis for those two values?

17. One of the spreadsheets provided includes C and P factor values for use in RUSLE2 and MUSLE. Many of these values are erroneous and are not consistent with recent research or with RUSLE2. Those values definitively need to be redone. For example, a C factor value is given for one year after seeding and fertilizing. The proper C factor value depends on the vegetation production level, but no information is given that relates to production level.

18. A check should be made to compare storm event erosion computed with RUSLE2 and storm event values computed with MUSLE. I have strong reservations about using MUSLE on small areas typical of construction sites. MUSLE was derived from large watersheds for the most parts. It probably does not properly compute deposition on concave slopes for example.

7. Selected Publications, H. Landphair

7.1 Erosion and Stormwater Quality

Landphair Harlow C., R.J. Charbeneau, J.F. Malina, M.E. Barrett, and Ming-Han Li: Non-Proprietary Small Footprint Storm Water Treatment BMP for Transportation Applications, in progress Due August 2006, Texas Department of Transportation and the Federal Highways Administration, Project No. 0-4611

Barrett, Michael E., H.C. Landphair, Ming-Han Li, J.F. Malina, Storm Water Treatment Effectiveness of Vegetated Roadsides, in progress Due August 2005, Texas Department of Transportation and the Federal Highways Administration, Project No. 0-4606

Landphair, Harlow C., M.A. Teal, Elizabeth Johnston, Evaluation of Current TxDOT Wetland Mitigation and Potential Alternatives to In-Kind Mitigation, August 2004, Texas Department of Transportation and the Federal Highways Administration, Project No. 0-4545

Malina Joseph F., T.A. Kramer, H.C. Landphair, D.E Thompson, et al, Evaluation of the Water Quality Impacts of Direct Bridge Runoff, Extended August 2005, Texas Department of Transportation and the Federal Highways Administration, Project No. 0-4605

Storey, Beverly J., Landphair Harlow C, McFalls Jett A., Storm Water Filtration and Sediment Control Effectiveness of Compost Filter Berms, January 2005, Texas Department of Transportation and the Federal Highways Administration, Project No. 0-4572

Landphair, Harlow C., J.A. McFalls, J.R. Schutt, Successional Establishment, Mowing Response, and Erosion Control Characteristics of Roadside Vegetation, August 2006, Texas Department of Transportation and the Federal Highways Administration, Project No. 0-4949

Landphair, Harlow C., J.A McFalls, B.J. Storey, Ming-Han Li, South Dakota Department of Transportation Water Quality Enhancement Program for Construction, January 2005, South Dakota Department of Transportation, Pierre, SD, Project Number SDDOT 2004-05.

Landphair Harlow C., B.J. Storey, J.A. McFalls, ENV102, Sediment and Erosion Control Training for the Texas Department of Transportation, TxDOT Contract No. 0-9210. Texas Department of Transportation, Austin, TX

McFalls, J.A., H.C. Landphair, J.R. Schutt, Comparison of Alternative Seed Mixes to Standard TxDOT Specifications, in progress Due August 2006, Texas Department of Transportation and the Federal Highways Administration, Project No. 0-5212

Landphair Harlow C. and Jim Schutt: Landscape and Aesthetic Design Guide Aug. 2001, Texas Department of Transportation, Project No. 407490-004, TxDOT, Austin, TX

Landphair Harlow C.,Ming-han Li, and J. Schutt, Regional Applications of Biotechnical Methods of Streambank Stabilization in Texas, In Progress, Begin 1 Sept. 1998 ending 31 August2001, Texas Department of Transportation and the Federal Highway Administration, Project No. 01836

Landphair Harlow C., David Thompson, and Ming-Han Li, Effectiveness of Low-End Stormwater Mitigation Efforts for TxDOT, In progress Begin 1 Sept. 1998 ending 31 August 2000. Texas Department of Transportation and the Federal Highways Administration, Project Nol 0-1837

Landphair, Harlow C., McFalls J., Lai M.H., Peterson B, *Alternatives to Silt Fence for Temporary Erosion Control on Highway Construction Sites,* 1997, Texas Department of Transportation and Federal Highway Administration, Project No. 0-1937.

Landphair, Harlow C. and Schutt J., *Corridor Management Plan, Loop 287 Lufkin, Texas,* 1997, Texas Department of Transportation, Austin, TX Project No. 97067-1.

Landphair, Harlow C., *Landscape Irrigators Manual,* Texas Engineering Extension Service, College Station, TX

Godfrey, Sally H., J.P. Long, H.C. Landphair, J. McFalls, Performance of Flexible Erosion Control Materials, 1993, Texas Transportation Institute, Project No. 1914-1, Texas Department of Transportation, Austin, TX.

Landphair Harlow C. and Alis Mahlen, Protocol for the Field Testing of Hydraulic Mulch Materials, TxDOT Project 1914-2, Texas Department of Transportation, Austin, TX and Texas Transportation Institute, Environmental Management Program.

7.2 Books

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8. Selected Publications G.R. Foster

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Foster, G.R. 1982. Modeling the erosion process. Chapter 8. *In:* Hydrologic Modeling of Small Watersheds. C.T. Haan, H.P. Johnson, D.L. Brakensiek, eds. American Society of Agricultural Engineers. St. Joseph, MI. pp. 297-382.

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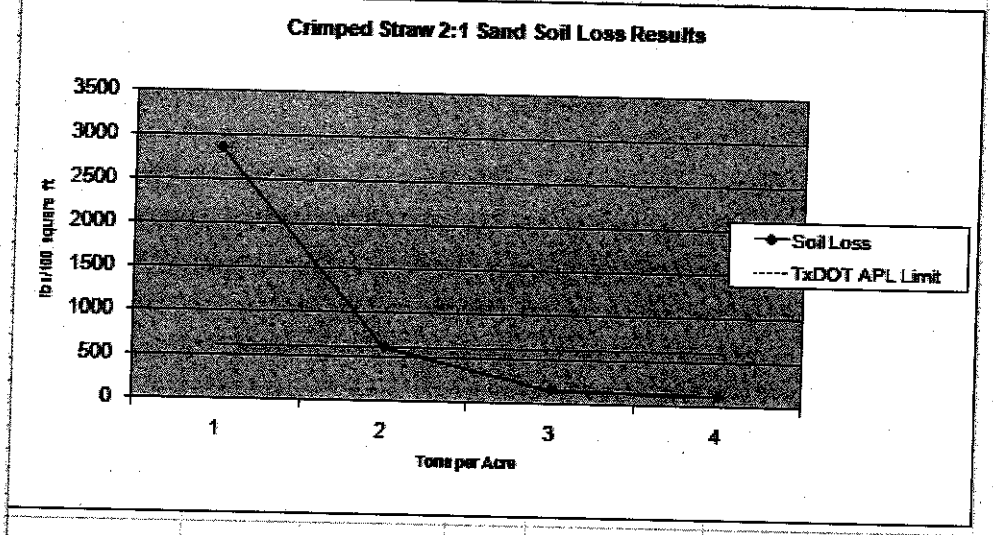
2:1 Slope

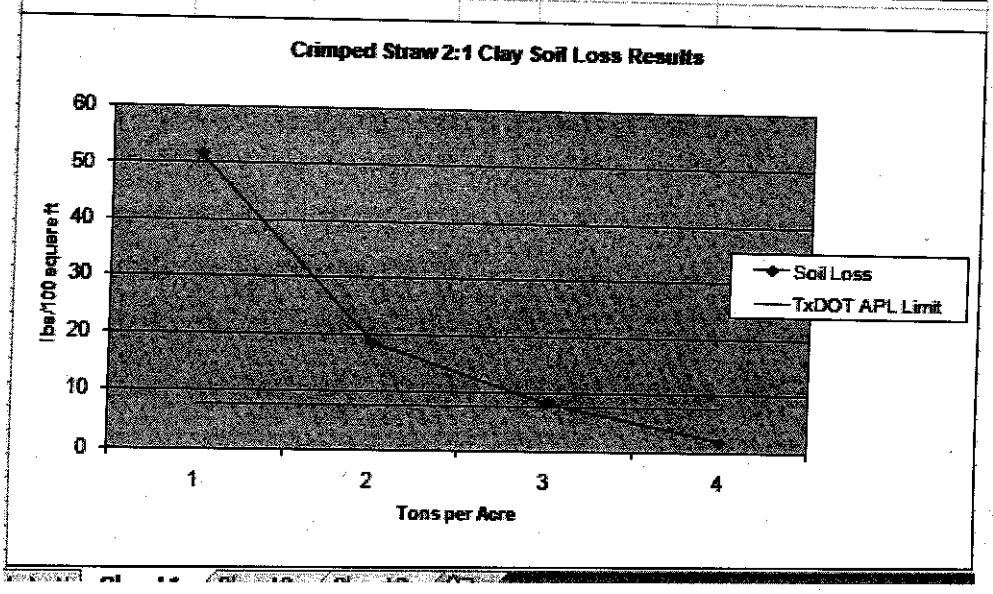
Sand

	Soil Loss lbs/100 square fee
1 Ton/Acre	2878.17
2 Tons/Acre	622.83
3 Tons/Acre	163.61
4 Tons/Acre	112.56
Bare Soil	*3665.33*
Tx DOT APL Lim	*670.8*

Clay

	Soil Loss lbs/100 square feet
1 Ton/Acre	51.83
2 Tons/Acre	18.72
3 Tons/Acre	8.56
4 Tons/Acre	1.94
Bare soil	*287.00*
TX DOT APL Lim	*7.69*





3:1 Slope

Sand

	Soil Loss lbs/100 square fee
Ton/Acre	222.28
: Tons/Acre	118.56
: Tons/Acre	56.5
- Tons/Acre	4.83
Bare Soil	1003.56
Tx DOT APL Lim	264.3

Clay

	Soil Loss lbs/100 square feet
1 Ton/Acre	6.11
2 Tons/Acre	5.5
3 Tons/Acre	6.11
4 Tons/Acre	0.78
Bare soil	266.50
TX DOT APL Lim	7.69