commentletters - Comment Letter - Draft Construction Permit

Public Comment
Draft Construction Permit
Deadline: 6/11/08 by 12 p.m.

From: "Myron Crawford" <Mcrawford@MISSIONWEST.com>
To: <commentletters@waterboards.ca.gov>
Date: Saturday, June 07, 2008 8:10:27 AM
Subject: Comment Letter - Draft Construction Permit
CC: <governor@governor.ca.gov>, <senator.alquist@sen.ca.gov>, <Senator.Perata@sen.ca.gov>, <Assemblywoman.Lieber@assembly.ca.gov>

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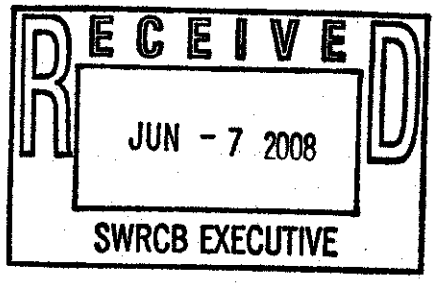
6/7/08



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Reference: **New Proposed Statewide Draft Construction General Permit**

Subject: **Comment Letter – Draft Construction Permit**

We are going on record as opposing any changes to the existing Statewide Construction General Permit. You and the other governmental agencies just don't seem to care how much unnecessary regulatory costs and administrative burdens you place on private industry. The result is what you would expect you are driving businesses out of the United State s every day because of increased costs. Municipalities and private industry both oppose this proposed permit and it should not enacted.

In general, the Draft Permit represents a substantial departure from the Existing Permit, with numerous fundamental changes including the inclusion of numeric action levels and numeric effluent limitations and the requirement to use active treatment systems for certain sites. These provisions follow on the heels of the Blue Ribbon Panel Report which was critical of many aspects of the BMP-based program. The Draft Permit does not continue with vetting the caveats to those recommendations as recommended in the Blue Ribbon Panel Report.

Other significant changes to the permit include provisions for public review of the SWPPP and related documents (with corresponding abilities to delay or rescind permit coverage based on the public review), a substantially modified monitoring program, numerous BMP specifics, and requirements to control "hydromodification" in post construction runoff by mandating, essentially, no hydrologic changes resulting from development.

This permit requires a 90 day public review period for SWPPP plans that were previously reviewed on ministerial basis by competent municipal staff prior to issuing grading permits. Most likely because of the additional paperwork and process necessary to implement the public process you would add an additional 60 days causing 150 days of unnecessary and costly delays. Elected legislators and public agencies are now turning every possible decision over to the general public process instead of letting competent city and county staff make the necessary decisions. The result is that you double and triple the cost of construction resulting in the loss of thousands of jobs to

the far east. The new Bay Bridge, Carquinez Bridge and Benicia Bridge are examples of these cost overruns. This country developed one of the finest infrastructure systems in the world thru the county, city, state and federal governmental system without any of the regulations you have in affect now, but you are now allowing that infrastructure crumble before our eyes and are now saddling private industry and private facilities with burdensome, costly, questionable and ill conceived legislation such as this new proposed "General Permit" that fails to meet any reasonable cost benefit test and yields negligible to nil real improvement or benefit.

The Fact Sheet to the Draft Permit identifies 14 key changes; however, the permit is loaded with other changes too numerous to list with the potential to substantially and adversely impact the construction industry and subsequently all other industry that requires a physical plant. Berkeley Economic Consulting out lines many but not all of the onerous provisions of the proposed permit.

We are requesting that the New Proposed Statewide Construction General Permit be terminated in its entirety and that the existing Statewide Construction General Permit continue in effect unchanged for the next 5 to 10 years.

Ill conceived legislation required the oil companies to invest billions to revamp refineries to produce and distribute MTBE based gasoline. Subsequently the oil companies and distribution facilities were required to invest billions to revamp facilities and refineries again to cease the use of MTBE based gasoline, and clean up the disastrous pollution caused by it. Ultimately the general public bears the cost of these terrible regulations that are ill conceived, untested, burdensome, onerous, costly and unfounded. The New Proposed Statewide Construction General Permit falls in this same category of ill conceived, untested, burdensome, onerous, costly and unfounded regulation.

In addition to the objections that we raise here we also incorporate by reference previous objections we have presented on prior SWRCB municipal and general permits. Additionally we incorporate any and all objections of Municipalities, other governmental agencies and private industry entities that file objections to the new proposed Draft Construction Permit.

We'll look forward to hearing from you.

Sincerely,

Myron Crawford

All recipients listed below are receiving a letter of protest to the proposed adopton and implementation of the SWRCB "Preliminary Draft Statewide Construction Storm Water Permit" being proposed for adoption.

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BEC Berkeley Economic Consulting

Economic Analysis of the SWRCB Proposed Construction General Permit

April 2, 2008

Prepared for
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Prepared by
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Executive Summary

The purpose of this report is to determine the economic consequences of new stormwater regulations promulgated by the California State Water Resources Control Board (SWRCB). Specifically, the report provides a qualitative and quantitative analysis of the impacts of stormwater regulation on construction activity such as urban development and transportation projects.

SWRCB is proposing a Construction General Permit (PCGP) to supersede the previous Construction General Permit Order 99-08-DWQ (CGP) that will regulate all construction activity for sites one acre or larger in California. The Board's stated aim is to regulate runoff from construction sites in order to protect the beneficial uses of water bodies. New to the PCGP is a risk based permitting approach that utilizes a risk calculator to rank construction sites based on their potential to negatively impact water bodies. Specific requirements that sites must undertake to comply with the PCGP are dependent on their risk categorization. Some of the new requirements include: implementing phased grading, employing Active Treatment Systems (ATS) in order to comply with numeric limits on stormwater discharges, and a minimum 90-day Storm Water Pollution Prevention Plan (SWPPP) public comment review period.

Figure ES-1 depicts the study area in Ventura County. Ventura County was chosen because it is typical of many areas in Southern California: there is a large presence of impaired water bodies in the region, a large amount of development is occurring, and the climate is fairly dry. The approach to valuing the impacts of the PCGP conducted used in this report can generally be applied to other counties in California.

The analysis is forward looking, assessing impacts of the PCGP between 2008 and 2030. A key component of the analysis is projections of land use changes over the study period. Cities in Ventura County have adopted a number of citizen-initiated proposals to limit the footprint of urban development. By far, the most important of these efforts is Save Open-Space and Agricultural Resources (SOAR), which requires voter approval for development outside of defined areas. The report projects development under the SOAR restrictions, which curbs urban growth outside of defined city boundaries and increases densities within these areas. A total of approximately 15,000 acres is forecasted to be developed within Ventura County's SOAR boundaries by 2030.

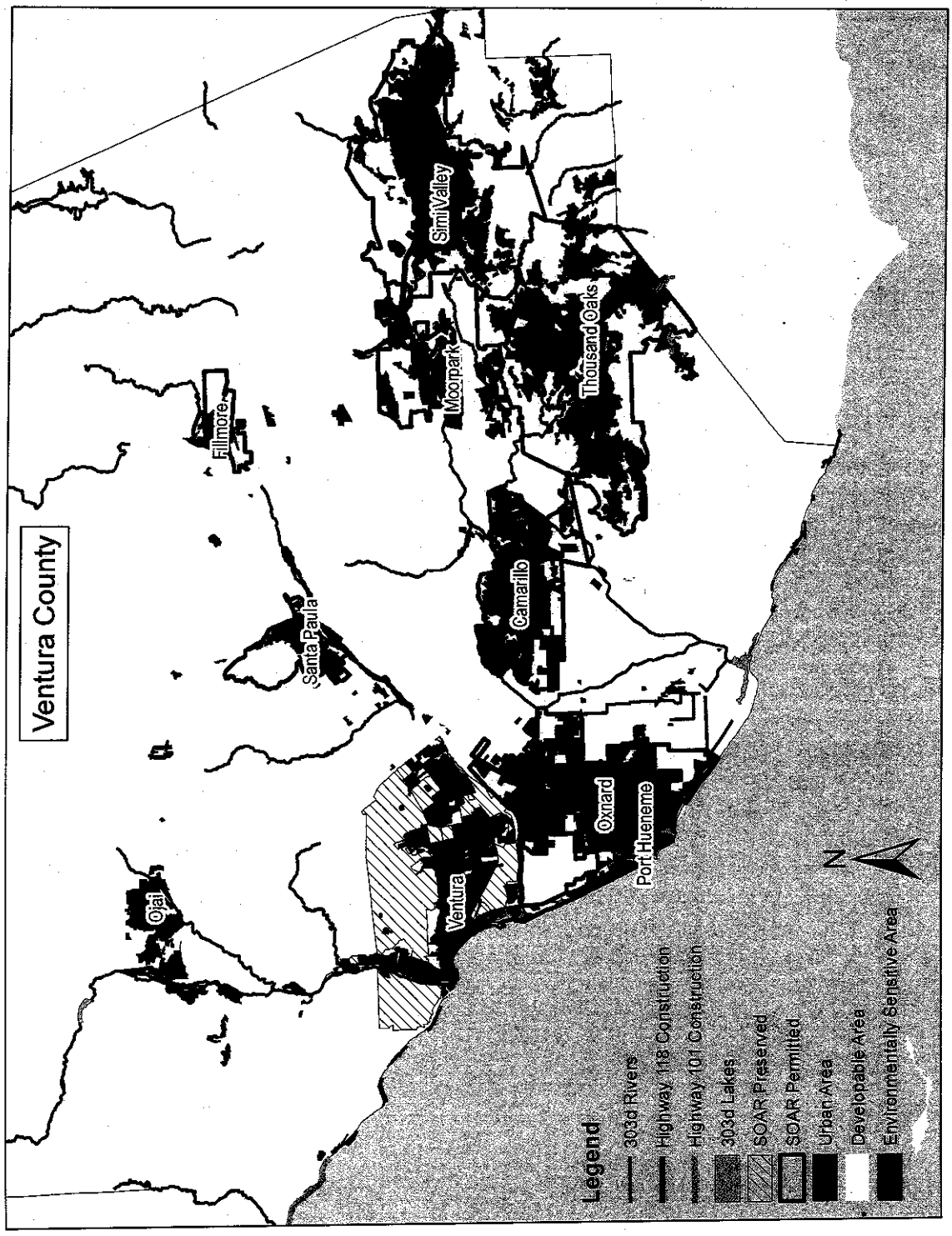

Figure ES-1: Ventura County Study Area

Over 90 percent of projected development in Ventura County is expected to be classified as medium or high risk. Sites that are likely to be exposed to one or more wet seasons or that are located within proximity to an impaired receiving water body are assigned a point value that nearly always assures these projects of being classified as at least medium risk. Additionally, permit requirements (and compliance costs) do not vary between a medium and a high risk site.

Future projects were differentiated by type (transportation or development) and site size (less than fifty or greater than fifty acres). Costs to comply with the CGP and PCGP were aggregated across the projected acreage of development under both scenarios. The analysis calculates two categories of economic impacts: baseline and incremental. Baseline impacts are the cost of all future projects to comply with the CGP. The analysis also estimates the incremental impacts of the additional effort to comply with the PCGP requirements. These costs are those incurred above what would have been required under the previous permit.

The impact of complying with the CGP and PCGP for road construction and development activity is shown in Table ES-1 and Table ES-2 below. Impacts are presented on a per-acre and on a county-wide basis. Total impacts of the regulation for the twenty three year period are given in present value, using a five percent real discount rate.

Table ES-1: Per Acre Impacts of the CGP and PCGP

		Baseline Cost	Incremental Cost
Transportation		$156,253	$40,520
Development	< 50 Acres	$6,879	$38,000
	>50 Acres	$2,520	$26,000

Table ES-2: Impacts of Compliance with the PCGP (in millions of dollars)

	Baseline Cost	Incremental Cost	Total Cost
Transportation	$9.4	$2.4	$11.8
Development	$38	$254	$292
Total	$47.3	$256.8	$304.1

The SWPPP delay, grading restriction, Rain Event Action Plan (REAP) and ATS are the main contributors to the economic impacts of the new regulation. The SWPPP delay is borne by all developers. Grading restrictions are one of the new source control requirements outlined in the PCGP and are borne by developers who do not implement ATS technology. Grading delay costs increase for large sites while ATS costs decrease for larger sites. There are economies of scale in using ATS technology due to the scale of treatment system capacity. Therefore, the study concludes that developers will choose to use ATS to minimize costs.

The PCGP will increase the cost of managing stormwater at project sites by a factor of six to eleven, relative to the current permit. For development projects, the PCGP costs are between $26,000 and $38,000 per acre, depending on the size of the project. For transportation projects, the cost of complying with the PCGP is $40,000 per acre over the cost of current regulations. Between 2008 and 2030 the PCGP is estimated to cost $256 million in 2008 dollars in Ventura County.

I. Background

1. Clean Water Act

The Federal Water Pollution Control Act Amendments of 1972 arose out of a growing concern with surface water quality. As amended in 1977, this law became commonly known as the Clean Water Act (CWA). The CWA gave the Environmental Protection Agency (EPA) the authority to implement water pollution control programs. The focus of EPA regulations logically began with the easiest pollution targets – those confined to enclosed locations and containing the greatest sources of pollution; a source and pollutant approach directed at discharges from traditional facilities such as sewage plants and industrial facilities. In recent years the EPA has been targeting runoff from streets and construction sites using a watershed based strategy that aims to both protect and repair water bodies.[1]

The CWA includes a number of provisions to protect water quality. The CWA created requirements to set water quality standards for all contaminants in surface waters. The CWA made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions.[2] The 1987 amendments to the CWA added Section 402(p), which established a framework for regulating municipal and industrial stormwater discharges under the National Pollution Discharge Elimination System (NPDES) Program. It also funded the construction of sewage treatment plants under the construction grants program and recognized the need for planning to address the critical problems posed by nonpoint source pollution. On November 16, 1990, the EPA published final regulations that established stormwater permit application requirements for specified categories of industries.[3]

2. Construction Stormwater Regulation

Exposed soil at construction sites is highly vulnerable to erosion by rainfall and wind, and the movement of trucks and machinery can "track" soil to the adjacent streets. There are a number of pollutants of concern at construction sites such as petroleum products and upturned sediment that can run off into the stormwater. Additionally, development projects also create increased impervious surfaces that impede the absorption of water and the capture of pollutants in soils. Impervious surfaces also increase the risk of flooding and diminish the capacity for groundwater recharge to occur. As a result the propensity for pollutants to be discharged to receiving waters increases and can reduce water quality.

The EPA regulates discharge from construction sites in two phases. Phase I of the regulations on construction activity established in 1990 provide that discharges of stormwater to waters of the United States from construction projects that encompass five or more acres of soil disturbance are effectively prohibited unless the discharge is in

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[1] US EPA website available at http://www.epa.gov/watertrain/cwa/, accessed on December 17, 2007.
[2] US EPA website available http://www.epa.gov/lawsregs/laws/cwa.html, accessed on December 17, 2007.
[3] State Water Resources Control Board, Fact Sheet for Water Quality Order 2007-XX-DWQ on March 2, 2007.

compliance with an NPDES Permit. Phase II which became final in 1999 lowered the permitting threshold from five acres to one acre.[4]

2.1 State Water Resources Control Board

In California, the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) enforce the NPDES stormwater program. Federal regulations allow two permitting options for issuing construction permits for stormwater discharge, individual permits and General Permits. Discharges of runoff from construction sites are subject to dual (state and local) stormwater regulation to ensure the most effective oversight of construction site discharges. Under this dual system, the RWQCB is responsible for enforcing the CGP.[5]

2.2 Order 99-08-DWQ

In 1999, SWRCB opted to adopt only one general permit[6] to cover all construction activities in California that are greater than one acre. By issuing a general permit SWRCB hopes to minimize the administrative costs of reviewing individual construction permits. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities.[7]

2.2.1 Prohibitions

Order 99-08-DWQ prohibits the discharge of materials other than stormwater and authorized non-stormwater discharges and all discharges which contain a hazardous substance in excess of reportable quantities unless a separate NPDES Permit has been issued to regulate those discharges. The discharge materials include sediment, Total Petroleum Hydrocarbons (TPH), toxics, and alkaline materials disrupting the pH of the stormwater.[8]

2.2.2 Effluent Limitations

In accordance with the requirements of CWA, effluent limitations contained in the 1999 CGP are narrative and include the requirement to implement appropriate Best Management Practices (BMP). The BMPs primarily emphasize source controls such as erosion control and pollution prevention methods. The 1999 General Permit requires

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[4] *Ibid.*

[5] California State Water Resources Control Board, Water Quality Order No. 2003-0005-DWQ, Waste Discharge Requirements for Storm Water Discharges From Small Municipal Separate Storm Sewer Systems (General Permit) available at http://www.swrcb.ca.gov/stormwtr/municipal.html, accessed on December 18, 2007

[6] State Water Resources Control Board National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) Water Quality Order 99-08-DWQ

[7] *Ibid*

[8] California State Water Resources Control Board, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) Water Quality, Order No. 2007-XX-DWQ, March 02, 2007.

dischargers to install structural controls as necessary. Other guidelines for sediment are those which will constitute best available technology (BAT) economically achievable and best conventional pollutant control technology (BCT) that will achieve compliance with water quality standards.

2.2.3 Receiving Water Limitations

Construction related activities, which cause or contribute to an exceedance of water quality standards must be corrected. The dynamic nature of construction activity allows the discharger the ability to quickly identify and correct the source of the exceedances. Water quality standards consist of the designation of beneficial uses of surface waters and the adoption of ambient criteria necessary to protect those uses. The best method to ensure compliance with receiving water standards is to implement BMPs that prevent pollutants from coming into contact with stormwater or from leaving the construction site in runoff.[9]

2.2.4 Storm Water Pollution Prevention Plan

The 1999 General Permit requires development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). Required elements of a SWPPP include:

- Site description addressing the elements and characteristics specific to the site
- Descriptions of BMPs for erosion and sediment controls
- BMPs for construction waste handling and disposal
- Implementation of approved local plans
- Proposed post-construction controls, including description of local post-construction erosion and sediment control requirements, and
- Non-stormwater management

2.2.5 Monitoring Program

According to Order 99-08-DWQ all dischargers are required to conduct inspections of the construction site prior to anticipated storm events and after actual storm events. During extended storm events, inspections must be made during each 24-hour period. Equipment, materials, and workers must be available for rapid response to failures and emergencies.

[9] SWRCB, Fact Sheet for Water Quality Order 2007-XX-DWQ, Preliminary Draft, March 2, 2007, obtained from SWRCB website at: http://www.waterboards.ca.gov/stormwtr/constpermits.html, site accessed November 5, 2007.

2.2.6 Retention of Records

The discharger is required to retain records of all monitoring information, copies of all reports and records of all data used to complete the Notice of Intent (NOI) for all construction activities for a period of at least three years.[10]

2.3 Regulatory History

The San Francisco Baykeeper, Santa Monica Baykeeper, San Diego Baykeeper, and Orange Coast Keeper filed a petition for writ of mandate challenging the Order 99-08-DWQ in Superior Court, County of Sacramento. The court directed the State Water Board to modify the provisions of the General Permit to require permittees to implement specific sampling and analytical procedures to determine the efficacy of BMPs implemented on a construction site. On December 27, 2001, the Court acknowledged that the permit had been modified, but required further actions by the SWRCB. In general, the Court expressed concern that certain aspects of the modifications might be ambiguous and might result in misinterpretation by dischargers. The 2007 PCGP incorporates portions of the legal rulings that are applicable.

On January 14, 2003, the Ninth Circuit issued its decision in *Environmental Defense Center v. USEPA*. This ruling found that EPA's Phase II regulations were deficient on three procedural grounds. The court determined that applications for general permit coverage (including the Notice of Intent and Storm Water Management Program [SWMP]) must be made available to the public, the applications must be reviewed and determined to meet the applicable standard by the permitting authority before coverage commences, and there must be a process to accommodate public hearings. The basis of the ruling was that the regulations did not require specific provisions and that they allowed dischargers, in essence, to write their own permits.[11]

2.4 Proposed Construction General Permit

In response to the environmental challenges to NPDES permits, in 2005 and 2006, the SWRCB convened an expert panel (Panel) to address the feasibility of Numeric Effluent Limits (NELs) in California's stormwater permits. Specifically, the panel was asked to address:

> "Is it technically feasible to establish numeric effluent limitations, or some other quantifiable limit, for inclusion in stormwater permits? How would such limitations or criteria be established, and what information and data would be required?"
>
> "The answers should address industrial general permits, construction general permits, and area-wide municipal permits. The answers should also address both technology-based limitations or criteria and water quality-based limitations or

[10] *Ibid*
[11] *Ibid*

criteria. In evaluating establishment of any objective criteria, the panel should address all of the following:

1) The ability of the State Water Board to establish appropriate objective limitations or criteria;

2) How compliance determinations would be made;

3) The ability of dischargers and inspectors to monitor for compliance; and

4) The technical and financial ability of dischargers to comply with the limitations or criteria."

The panel made the following observations:

"Limited field studies indicate that traditional erosion and sediment controls are highly variable in performance, resulting in highly variable turbidity levels in the site discharge.

Site-to-site variability in runoff turbidity from undeveloped sites can also be quite large in many areas of California, particularly in more arid regions with less natural vegetative cover and steep slopes.

Active treatment technologies involving the use of polymers with relatively large storage systems now exist that can provide much more consistent and very low discharge turbidity. However, these technologies have as yet only been applied to larger construction sites, generally five acres or greater. Furthermore, toxicity has been observed at some locations, although at the vast majority of sites, toxicity has not occurred. There is also the potential for an accidental large release of such chemicals with their use.

To date most of the construction permits have focused on TSS and turbidity, but have not addressed other, potentially significant pollutants such as phosphorus and an assortment of chemicals used at construction sites.

Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Stormwater Pollution Prevention Plans, or field inspectors.

The quality of stormwater discharges from construction sites that effectively employ BMPs likely varies due to site conditions such as climate, soil, and topography.

The States of Oregon and Washington have recently adopted similar concepts to the Action Levels."[12]

The panel made the following conclusions:

> "It is the consensus of the Panel that active treatment technologies make Numeric Limits technically feasible for pollutants commonly associated with stormwater discharges from construction sites (e.g. TSS, pH, turbidity) for larger construction sites. Technical practicalities and cost-effectiveness may make these technologies less feasible for smaller sites, including small drainages within a larger site, as these technologies have seen limited use at small construction sites. If chemical addition is not permitted, then Numeric Limits are not likely feasible."
>
> "The Board should consider Numeric Limits or Action Levels for other pollutants of relevance to construction sites, but in particular pH. It is of particular concern where fresh concrete or wash water from cement mixers / equipment is exposed to stormwater."
>
> "The Board should consider the phased implementation of Numeric Limits and Action Levels, commensurate with the capacity of the dischargers and support industry to respond."

The SWRCB reviewed the panel's findings as well as public comments. As a result, the following significant changes are proposed to amend the Construction General Permit, as outlined in the PCGP. All of these changes have the potential to affect construction costs.

- Technology-based Numeric Action Levels (ALs): the General Permit includes ALs for pH, turbidity, and Total Petroleum Hydrocarbons (TPH). The numeric Action Levels are 6.5-8.5 pH, 500 NTU turbidity, and 15mg/L TPH.

- Technology-based Numeric Effluent Limitations (NELs): the General Permit includes a time schedule (18 months) to implement NELs for pH in all discharges of stormwater from construction activities. NELs for pH should range between 6.5 and 8.5, 10 NTU for turbidity and chronic toxicity from ATS should be equal to 1.0 TUc.

- Action Level Exceedance Evaluation Report (ALEER): any discharger who exceeds two consecutive ALs for a single parameter at a single effluent sampling location must electronically submit to the State Water Board (and make publicly available) a report of the exceedance and their response, etc.

- Risk-based Permitting Approach: the General Permit includes a three tiered system for discharges that is based on the relative risk their project poses to causing water quality impacts. The site and project-specific factors used in this

[12] Stormwater Panel Recommendations to the California State Water Resources Control Board, *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction activities*; June 19, 2006

determination include the "R" factor, proximity to receiving waters, acreage of site to be graded, dominant soil type, design of sedimentation basins, and slope-length of disturbed area.

- Minimum Requirements Specified: the General Permit now specifies more minimum BMPs and requirements that were previously only required as elements of the SWPPP or were suggested by guidance.

- Project Site Soil Characteristics Monitoring and Reporting: all projects must monitor and report the soil characteristics at the project location. The primary purpose of this requirement is to provide better risk determination and eventually better program evaluation.

- Effluent Monitoring and Reporting: effluent monitoring and reporting for pH, turbidity and TPH in storm water discharges. The primary purpose of this monitoring is to compare against the NEL of pH and ALs for the other parameters. The secondary purpose is to provide needed information to use in overall program evaluation.

- Receiving Water Monitoring and Reporting: medium risk dischargers must monitor receiving waters when there are two exceedances of ALs or two exceedances of the NEL for pH. High risk dischargers are required to monitor receiving waters when there are two exceedance of ALs or one exceedance of the NEL for pH. The primary purpose is to provide needed information to use in overall program evaluation.

- Active Treatment System (ATS) or Specific Source Control Requirements: if the soils to be exposed on a site contain more than ten percent (by weight) particle sizes smaller than 0.02 mm (medium silt), the discharger shall either deploy an ATS or implement specific source control requirements to prevent the mobilization of small sediment particles that are difficult to treat using conventional BMPs.

- New and Re-development Performance Standards for Hydromodification Impacts: all sites must meet new and re-development performance standards designed to encourage all constructed sites disturbing over one acre in California to avoid, minimize and / or mitigate the hydromodification impacts.

- Rain Event Action Plan (REAP): sites must develop and implement a REAP that must be designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event.

- Site Photographic Self Monitoring and Reporting: all medium and high risk projects must self-report photographs of their sites at least once quarterly if there are rain events that cause a discharge. The purpose of this requirement is to help Regional Water Board staff prioritize their compliance evaluation measures (inspections, etc.). In addition, this reporting will provide more transparency of compliance related information to the public.

- Annual Reporting: all projects that are enrolled for more than one quarter must submit information and annually certify that their site is in compliance with these requirements. Most of the information required to be reported is supposed to be submitted all throughout the year (usually within some specified time after a triggering event occurs). The primary purpose of this requirement is to provide information needed for overall program evaluation and pubic participation.

- Certification / Training Requirements for Key Project Personnel: key personnel (e.g. SWPPP preparers, inspectors, etc.) must have specific training or certifications to ensure their level of knowledge and skills are adequate to ensure compliance.[13]

3. Municipal Separate Storm Sewer System Regulation

Many cities have constructed an infrastructure to collect stormwater separately from municipal wastewater. Municipal Separate Storm Sewer Systems (MS4) collect stormwater and eventually distribute it to open flood control channels, rivers, and oceans. Alternatively wastewater generated by toilets and showers enters a closed network of pipes and is carried to treatment plants where it is treated before being discharged. Runoff pollutants in MS4s are different in nature from those in sewage. Pathogens are present, but in far smaller concentrations, as are nutrients such as phosphorus and nitrogen. There may be more petroleum hydrocarbons, dust, sediments, and settled air pollutants in runoff, but total organic content in runoff is usually much lower than in wastewater.[14]

The EPA regulates MS4s as part of the CWA by issuing permits to municipalities with separate storm sewer systems. Similar to the Construction permits, MS4 permits were issued in two phases. Under Phase I, which started in 1990, the RWQCBs have adopted NPDES stormwater permits for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 people) municipalities. Most of these permits are issued to a group of co-permittees encompassing an entire metropolitan area. These permits are reissued as the permits expire. As part of Phase II, in 2003 the SWRCB adopted a General Permit for the Discharge of Storm Water from Small MS4s to provide permit coverage for smaller municipalities, including non-traditional Small MS4s, which are governmental facilities such as military bases, public campuses, and prison and hospital complexes.[15]

The MS4 permits require the discharger to develop and implement a Storm Water Management Plan / Program with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). MEP is the performance standard specified in Section 402(p) of the Clean Water Act. The management programs specify what BMPs

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[13] SWRCB, Fact Sheet for Water Quality Order 2007-XX-DWQ, Preliminary Draft, March 2, 2007, obtained from SWRCB website at: http://www.waterboards.ca.gov/stormwtr/constpermits.html, site accessed November 5, 2007.
[14] Devinney, Joseph S. et al, "Alternative Approaches to Stormwater Quality Control," August, 2005.
[15] California State Water Resources Control Board website:
http://www.waterboards.ca.gov/stormwtr/municipal.html

will be used to address certain program areas. The program areas include public education and outreach; illicit discharge detection and elimination; construction and post-construction; and good housekeeping for municipal operations. In general, medium and large municipalities are required to conduct chemical monitoring, though small municipalities are not.

In order to receive an MS4 permit, the co-permittees are required to demonstrate their legal authority to

- Regulate sources of urban runoff from construction activities;
- Regulate illicit discharges to the MS4;
- Regulate disposal of materials other than stormwater to the MS4;
- Implement mechanisms to require compliance with co-permittee storm water ordinances, permits, contracts, or orders;
- Carry out inspections, surveillance, and monitoring;
- Require the use of BMPs to prevent or reduce the discharge of pollutants into MS4s to the MEP; and
- Require documentation on the effectiveness of BMPs implemented to reduce the discharge of pollutants to the MS4 to the MEP.[16]

3.1 General Permit for Small MS4s

SWRCB elected to adopt a statewide general permit for Small MS4s (Order No. 2003-0005-DWQ) in order to efficiently regulate numerous stormwater discharges under a single permit. The General Permit for Small MS4s is consistent with the ruling in *Environmental Defense Center v. EPA* on stormwater applications for general permit coverage. Therefore, any NOI or SWMP must be made available to the public, applications must be reviewed and determined to meet the MEP standard by the permitting authority before coverage commences, and there must be a process to accommodate public hearings.[17]

The General Permit regulates discharges of storm water from "regulated Small MS4s." A "regulated Small MS4" is defined as a small MS4 that discharges to a water of the United States or to another MS4 regulated by an NPDES permit. A discharger can be automatically designated if they are located in an urbanized area, or after consideration of whether they meet the following factors: high population density, high growth or growth potential, significant contributor of pollutants to an interconnected permitted MS4,

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[16]California State Water Resources Control Board, Water Quality Order No. 2003-0005-DWQ, Waste Discharge Requirements for Storm Water Discharges From Small Municipal Separate Storm Sewer Systems (General Permit) available at http://www.swrcb.ca.gov/stormwtr/municipal.html, accessed on December 18, 2007

[17] *Ibid*

discharge to sensitive water bodies, and significant contributor of pollutants to waters of the US.

Order No. 2003-0005-DWQ:

- Prohibits the discharge of pollutants other than stormwater that are not authorized by the General Permit or separate NPDES permit.
- Requires permittees to implement BMPs to protect water quality to the MEP in lieu of numeric effluent limits.
- Requires permittees to develop and implement a SWMP that describes BMPs, measurable goals, and timetables for implementation in the following six program areas (Minimum Control Measures): public education, public participation, illicit discharge detection and elimination, construction site stormwater runoff control, post construction stormwater management, pollution prevention / good housekeeping for municipal operations.
- Requires regulated Small MS4s to comply with the receiving water limitations iterative process once their plans are fully implemented.
- Requires permittees to monitor, track and assess their program to ensure BMP effectiveness and submit annual reports to the appropriate RWQCB.
- Allows the permittee to rely on a separate implementing entity to address the stormwater issues of the permittee.
- Requires the retention of records for a period of at least five years.

RWQCBs and their staff review and decide whether to approve SWMPs and, when requested, conduct public hearings on NOIs and SWMPs.[18]

4. Overlap of MS4 and Construction Permits

Construction activity disturbing more than one acre that takes place in an area that meets the criteria of an MS4 (small or larger MS4) would be required to apply for coverage under both the construction general permit and an MS4 permit.

5. Implications of Permit Provisions for Construction Projects

The PCGP has added a number of important provisions to the previous general construction permit that will create significant economic impacts. The requirement for project modifications depends on the construction project's site evaluation and risk assessment. That is riskier sites have more requirements for project modifications than does a low risk construction site.

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[18] *Ibid*

The PCGP uses a risk-based permitting approach. Risk is evaluated based on the potential of the project to negatively impact water quality. Factors include: time of planned construction with exposed soils, the hydraulic connection to sensitive receiving waters, soil analysis Rainfall "R" factor, soil erodibility "K" factor, soil Length Slope "LS" factor, and soil analysis – hydrologic soil group. Each factor is assigned a range of point values corresponding to specific soil characteristics that increase risk. In addition site size and hence project length are important risk factors as well. For example if soils will only be exposed during the dry season the site is assigned zero points, and if soils will be exposed over multiple wet seasons the site is assigned four points. The resulting risk categories as described in the PCGP have the following total point values: a low risk site's points total between one and three, medium risk between four and nine, and high risk sites have more than ten total points.[19]

The proposed risk assessment calculator does not, however, account for a number of other factors. Foremost among the omitted factors is risk reduction from use of erosion and sediment BMP implementation. In addition the calculator does not include the characteristics of the receiving water – an important concern in assessing the likeliness of a construction site to impair water quality. For example, it is possible that a receiving water body naturally has a greater turbidity than the runoff from the construction site.

5.1 Grading Restrictions

The PCGP specifies that for sites with more than ten percent (by weight) particle sizes smaller than 0.02 mm (medium silt), the discharger shall either use an ATS or comply with a list of source control requirements. Chief among these requirements is limiting the areas of active construction to five acres at any one time. Limiting grading to less than five acres can have significant impacts in large construction sites. Phased grading can lengthen the time to complete a large construction project. Depending on specific site characteristics, for construction projects disturbing between 100 and 250 acres, delay times range from two to five times as long to complete grading.[20] This could cause significant delay costs for the developers and home buyers. Additionally, phased grading may unintentionally adversely affect water quality by lengthening a dry season only project into the wet season or multiple years and thereby also push the project into a higher risk category.

5.2 Active Treatment Systems

The PCGP, if implemented as drafted, would impose requirements to use Active Treatment Systems (ATS) at most larger construction sites (all sites with more than five acres of soil disturbance and ten percent of soil particles less than 0.02 mm). ATS systems (or the chemicals utilized by them), while not covered under the current General Permit, are addressed in the CASQA BMP Handbook under SE-11: Chemical Treatment. Under this BMP guidance document, the user is required to obtain authorization from the

[19] Electronic communication from Mark Grey at CBIA,"Draft Risk Calculator" on December 27, 2007.
[20] Personal communication with Jerry Pabbruwee of Sukut Construction Inc.

Regional Water Quality Control Board prior to implementation of the chemical treatment system.

The PCGP definition for ATS lists chemical coagulation, chemical flocculation, and electrocoagulation as three separate ATS treatment processes. ATS is required because depending on the nature of the suspended particles and the runoff hydraulics, conventional sedimentation and filtration processes may not provide sufficient reductions in turbidity without first aggregating smaller particles into larger agglomerates via coagulation and flocculation processes. Additionally filtration processes are often incorporated into active treatment systems.

Implementation information and hypothetical cost estimates for ATS show that costs of technology becomes prohibitive as volume of runoff decreases (either in dry climates and / or for smaller sites). Comparative studies (both from provided data and from hypothetical costs) show that ATS costs are significantly higher than implementing both standard and / or enhanced traditional BMPs on a construction site.[21]

5.3 Hydromodification

Hydromodification is defined as an increase in runoff peak flow, volume, and flow durations which is caused by development increasing impervious surface area. Hydromodification impacts stream channels by intensifying sediment transport and erosion processes.

A new provision in the PCGP is to require all sites to meet new and re-development performance standards designed to encourage all constructed sites disturbing over one acre in California to avoid, minimize and / or mitigate the hydromodification impacts. The SWPPP shall ensure that flow patterns, and surface retention and recharge rates, are maintained in order to minimize post-development impacts to offsite water bodies.[22]

Although there are likely to be significant economic impacts from complying with the hydromodification requirements, this analysis does not analyze these impacts. It is unclear at this time whether hydromodification will be regulated in the Construction General Permit rather than in another regulatory framework. It seems reasonable that for projects in MS4 areas, MS4 permits and / or watershed / project-specific planning should be the medium to establish hydromodification control standards. For projects outside the jurisdiction of an MS4 permit, there are a number of other appropriate means to regulate hydromodification such as watershed planning / policies, Army Corps of Engineer 401 certifications guidance, CEQA comment guidance, California National Park Service Plan, and qualified local programs. It is also unclear at this time how construction sites would minimize hydromodification impacts. Due to these uncertainties this analysis will not assess the impacts of meeting the proposed hydromodification requirements.

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[21] Geosyntech Consultants for CBIA, "Evaluation of Active Treatment Systems (ATS) for Construction Site Runoff," November 6, 2007.

[22] SWRCB Fact Sheet for Order 2007-XX-DWQ on March 2, 2007, available at http://www.swrcb.ca.gov/stormwtr/docs/constpermits/factsheet070302.pdf , accessed on December 5, 2007.

5.4 Numerics

The PCGP contains language on numeric compliance whereas the previous Construction General Permit had qualitative requirements. These numeric limits are uniform over time (once fully implemented) and across the state. Numerics are included in Numeric Effluent Limitations (NELs), Numeric Action Levels (ALs), and for ATS discharges. The PCGP includes a time schedule (18 months) to implement NELs for pH in all discharges of stormwater from construction activities. It includes ALs for pH, turbidity, and Total Petroleum Hydrocarbons (TPH). Numeric discharges from ATS are prescribed for the parameters of turbidity, pH, acute toxicity, and chronic toxicity.

Penalties are set for exceedances of numeric limits. Any discharger who exceeds two consecutive ALs for a single parameter at a single effluent sampling location must electronically submit to the State Water Board (and make publicly available) a report of the exceedance and their response.

Complying with these numeric limits in different weather events, in different climates, and discharging to receiving water bodies with differing characteristics, can pose significant economic impacts. It is likely that many sites will need to implement ATS technology to meet numeric effluent limits. Penalties from failure to comply and to correct the non-compliance will also pose significant impacts.

5.5 Review Period

It is stated in the PCGP that Regional Water Boards shall receive and review comments provided from the public on new permit applications within the 90-day public review period. Based upon the public comments and Regional Water Board review of the permit application submittal, Regional Water Boards may take actions that include, but are not limited to: rescinding permit coverage, requiring public hearings or formal Regional Water Board permit approvals, requesting dischargers to revise their SWPPP and Monitoring Programs within a specified time period, or take no action.[23] A 90-day review period will cause project delays that may be elongated if revisions or other modifications are needed. Further, there is an increased uncertainty and risk for investors as permit coverage may be rescinded. Delay and risk / uncertainty can pose significant economic impacts to developers, home buyers, and investors.

6. Ventura County

This analysis uses a case-study approach, assessing impacts of stormwater regulation in Ventura County. Ventura is typical of counties in Southern California for its hydrology, climate and scale of development; however, it is also unique in its urban growth regulation and local MS4 permit provisions. While it cannot be said that the impacts

[23] California State Water Resources Control Board, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) Water Quality, Order No. 2007-XX-DWQ, March 02, 2007, available at http://www.swrcb.ca.gov/stormwtr/docs/constpermits/order_permitwattach.pdf accessed on December 11, 2007.

calculated for Ventura County would be representative of other counties in California, the method used to assess impacts in this case study can be applied to other counties in California, given similar data availability.

The following sections describe the unique aspects of Ventura County regulations, as they affect this analysis, in further detail.

6.1 Save Open-Space and Agricultural Resources

The Save Open-Space and Agricultural Resources (SOAR) is an initiative in Ventura County designed to protect the region from urban sprawl. The first SOAR Initiative was approved by the voters in the City of Ventura in 1995. Since the first 1995 initiative, SOAR initiatives have passed in all major cities in Ventura County, and also on a countywide basis throughout Ventura County. [24] This initiative affects the location of construction activities; bounding growth to city limits and promoting densification. The SOAR boundaries have built-in 15 or 20-year expiration dates and may or may not be extended at that time.[25] Nevertheless, this analysis takes the SOAR boundaries as given in projecting the extent and location of future development within the study period 2008 to 2030.

6.2 Ventura Draft MS4 Permit

In the second Draft Ventura County MS4 Permit, Order 07-xxx, a grading ban was instituted which limits grading to the dry season only (April 15th to October 1st) for sites with the following characteristics:

1. On hillsides with slopes 20% or steeper prior to land disturbance (if hillside development is not defined by a zoning ordinance, then the prohibition will apply to steep or long continuous slopes, or areas with silty soils, fine sands, or soils lacking vegetative cover).
2. Directly discharging to a water body listed on the CWA § 303 (d) list for siltation or sediment; or
3. Within or adjacent to an environmentally sensitive area (ESAs)

In addition there is a specific suite of BMPs that all construction projects are required to implement.

A Grading Prohibition Variance may be granted where the project proponent can demonstrate that the proposed BMP measures can be reasonably expected to:

(1) Not cause or contribute to the degradation of water quality.

(2) Ensure that Total Suspended Solids discharged is 100mg/L or less.

(3) Ensure that Turbidity of the discharge is 50 NTU or less.

(4) Not impair beneficial uses.

(5) Includes a monitoring program to ensure effectiveness.

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[24] SOAR website, available at http://www.soarusa.org/, accessed on March 11, 2008.
[25] *Ibid.*

Under the statewide PCGP, the factors outlined above would be satisfied when implementing ATS technology. The expected increased costs of grading delays resulting from the analysis in this report are believed to render development projects unprofitable without ATS. Thus, all new development is expected to use ATS technology for compliance and profitability purposes. Barring any unforeseen circumstances regarding the issuing of the Grading Prohibition Variances, the MS4 grading ban should not have any economic impact that is significantly different from the results of this report.[26] Should Variances not be issued impacts are likely to be far greater than those estimated in this report.

[26] California Regional Water Quality Control Board, Los Angeles Region, Order Number 07-xxx; August 28, 2007; Second Draft

II. Methodology

1. Risk

The PCGP uses a risk-based permitting approach where risk is a function of proximity to receiving water bodies, soil erosivity, slope, rainfall, and number of wet seasons.[27] As previously described, risk is evaluated on a point system based on the potential of the project to negatively impact water quality. Depending on the total number of points, each construction site is placed in either the low, medium or high risk category.

The PCGP risk calculator is presented in Appendix A to this report.

2. PCGP Risk-Based and non Risk-Based Requirements

The requirements to comply with the PCGP are determined by a construction site's risk category, as shown in the table below. Note that receiving water monitoring is only required at medium risk sites when the discharge from any drainage area exceeds the AL for pH or turbidity or the NEL for pH for two consecutive storm events. In such a case, medium risk dischargers must sample receiving waters for the parameter(s) that consecutively exceeded the AL or NEL. Receiving water monitoring is only required at high risk sites when the discharge from any drainage area exceeds the AL for pH or turbidity or the NEL for pH during *any* storm event; in that case dischargers must immediately sample receiving waters for the parameter(s) that exceeded the AL or NEL.[28] The requirements under the PCGP stipulate submitting an Action Level Exceedance Event Report (ALEER). The costs associated with the ALEER and receiving water monitoring are specific to the monitoring at individual sites and are only required in the event of an exceedance as described above. As a result these costs are expected to be nominal and are thus not included in the final cost calculation.

[27] Electronic communication from Mark Grey at BIA / SC, "Draft Risk Calculator" on December 27, 2007.
[28] California State Water Resources Control Board, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) Water Quality, Order No. 2007-XX-DWQ, March 02, 2007.

Table 2: Summary of Risk Categories and Required Elements			
Required Elements	**Low Risk**	**Medium Risk**	**High Risk**
Project Implementation Requirements	X (almost all)	X	X
Effluent Monitoring		X	X
ALs		X	X
Receiving Water Monitoring		X	X
Visual Monitoring	X	X	X
SWPPP		X	X
REAP	X	X	X
NELs for pH		X	X
Annual Report	X	X	X

The PCGP outlines further requirements for source control options that are independent of a site's risk categorization. These requirements, in particular the grading restriction, can have large economic impacts as described in the Background Section 5.1 Grading Restrictions. The PCGP specifies that if the soils to be exposed at a site contain more than ten percent (by weight) particle sizes smaller than 0.02 mm (medium silt), the discharger shall either comply with the following source control requirements or use an ATS:

a. Maintain vegetative cover as much as possible by developing the project in a phased approach to reduce the amount of exposed soil at any one time.

b. Limit the areas of active construction to five acres at any one time.

c. Provide 100 percent soil cover for all areas of inactive construction throughout the entire time of construction, on a year-round basis.

d. Provide appropriate perimeter control at all appropriate locations along the site perimeter and at all inlets to the storm drain system at all times during the rainy season.

e. Provide vegetated buffer strips between the active construction area and any water bodies.

f. Provide stabilized construction entrances and limit all vehicle and foot traffic to those entrances.

It is also important to note that this analysis assumes that if one part of a development project is classified as medium or high risk then the entire site is subject to the more stringent requirements. This assumption was made because it is likely that the entire development project would drain into the same receiving water body. With respect to

road construction, projects can be very lengthy and construction is predicted to occur in five mile road segments.[29] Thus, if any part of the five mile segment lies within 500 feet of an impaired receiving water body the entire five mile segment is assigned to the same risk category.

Further, this analysis assumes that all projects would commence at the beginning of the dry season and run continuously. It is reasonable that a developer would try to avoid being classified in a higher risk category and so attempt to begin projects in the dry season. Since the dry season is defined as the period between April 15th and October 15th, only projects which are predicted to take longer than six months to grade would run into at least one wet season. In addition, future development is expected to schedule project start time appropriately in order to account for the 90-day SWPPP review period, i.e. submit SWPPPs 90 days before the beginning of the dry season, and start the project at the beginning of the dry season.

2.1. Mapping Risk

Using the georeferenced attributes of the risk assessment calculator as an input to GIS, it is possible to identify high risk locations in Ventura County. A map is constructed for Ventura County, which ascribes each region within the study area to one of the three risk categories, which are low, medium and high. All future construction projects within the study area are projected onto this map. This is necessary in order to predict what permit requirements future construction projects will be subject to. This analysis then assesses the projects' risk category and applies the costs accordingly. Details of the GIS data inputs are outlined below.

2.1.1 Water Bodies

The California Department of Transportation (Caltrans) maintains a list of all impaired water bodies, referred to as the 303(d) list. Under Section 303(d) of the 1972 Clean Water Act, states, territories and authorized tribes are required to develop a list of water quality limited segments. The waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for water on the lists and develop action plans, called Total Maximum Daily Loads (TMDL), to improve water quality.[30]

The most recent available year for the 303(d) list is the 2006 data available on the SWRCB website. Geographic Information System (GIS) files are provided for all impaired bays and harbors, coastal and bay shorelines, estuaries, lakes, rivers, and wetlands. These data were used to ascertain the proximity of any region within the study area to sensitive receiving water.

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[29] Personal communication with Ron Kazinsky, Caltrans District 7 Deputy District Director for Environmental Planning, on January 29, 2008.

[30] SWRCB website's 303(d) List page, available at http://www.swrcb.ca.gov/tmdl/303d_lists2006.html, accessed on March 31, 2008; http://www.waterboards.ca.gov/tmdl/docs/303dlists2006/gis/.

2.1.2. Soil Characteristics

The U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) offers data from their digital soil survey on soil characteristics. NRCS conducts soil mapping by determining the soil types or other properties of the soil cover over a landscape, and mapping them for others to understand and use. Primary data for the soil survey are acquired by field sampling and supported by remote sensing. NRCS provides tables and GIS files on soils by location containing physical, chemical, and engineering properties such as soil depth, soil texture, particle size and distribution, plasticity, permeability, available water capacity, shrink-swell potential, corrosion properties, and erodibility.[31]

The NRCS soil data for the study area were evaluated to estimate the R Factor, K Factor, LS Factor, and hydrologic soil groups that determine risk.

The NRCS electronic Field Office Technical Guides provides the Highly Erodible Land (HEL) Class values for the majority of soil classifications in Ventura County. The HEL is calculated using the R, K, LS and hydrologic soil group for each soil type present in Ventura County in 1987. The HEL is updated every 100 years by the USDA.[32]

Using these data it is possible to append the NRCS shapefiles with the HEL factors and calculate a risk value for each soil type specific to the georeferenced location.

2.1.3. Environmentally Sensitive Areas

Environmentally sensitive areas (ESA) GIS files were obtained from the Ventura County Watershed Protection District.[33] These areas may require additional conservation measures to protect the habitats. Construction activities undertaken within proximity to these areas are subject to stricter stormwater regulations under both the PCGP and Ventura MS4 permit.

3. Future Construction

In order to accurately predict future development patterns and road projects in Ventura County, the analysis relies on a number of data including: SOAR boundaries, Southern California Association of Governments (SCAG) forecasts, SWRCB stormwater permit notice of intent (NOI) database, and Caltrans forecasted transportation projects. Using these data a model was constructed to predict the most probable location of future commercial, industrial, and residential development and transportation projects for the study area between 2008 and 2030. All future projects were projected onto the map that assigns the appropriate risk designations within the study area.

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[31] USDA NRCS website, available at http://websoilsurvey.nrcs.usda.gov/app, accessed on December 27, 2007.

[32] Personal communication with Jim Kocsis, USDA NRCS, on January 18, 2008.

[33] Electronic communication with David Thomas, Ventura County Watershed Protection District, on March 26, 2008.

3.1. Roads

Caltrans developed a database called the California Transportation Investment System (CTIS). CTIS2 includes spatial data on all planned highway projects from regional transportation plans approved as of summer 2003 as well as all programmed projects from the 2004 State Transportation Improvement Program (STIP) and the State Highway Operation and Protection Program (SHOPP). CTIS organizes, displays, and provides the locations of transportation projects planned over the next 20 years. Included in this tool are highway, Proposition 1B Bond, local, rail, airport, bicycle, pedestrian, and transit projects at both the State and regional levels. [34]

CTIS2 data were supplemented with more recent 2007 Caltrans data from Ventura County's local District 7 Office. These show the location, description, and cost of all road construction projects in Los Angeles and Ventura County that were under design in 2007 and are scheduled to start between 2008 and 2011. These data were used in conjunction with the Ventura County Department of Transportation 2008 Five Year Plan that includes the location, description, and cost of all planned capital projects in the County.

3.2. Development

In order to model the urban growth process in Ventura County, a combination of data were chosen that would best reflect the extent and location of future development. SOAR GIS boundaries were obtained that delineate the geographic scope of this analysis. This analysis assumes that all development is confined within these boundaries within the study period 2008 to 2030. In order to accurately portray where development is likely to occur within the SOAR limits, GIS data were used that show the location of areas that are already urbanized. This data is provided by the California State Department of Conservation's Farmland Mapping and Monitoring Program (FMMP).[35]

The primary sources for estimates of future housing and population was the study area's federally designated Metropolitan Planning Organization (MPO). Typically created by county governments, these forecasts are the preferred source for growth estimates because they are created using detailed knowledge about local growth trends and characteristics, potentially resulting in more accurate estimates than those obtained with mathematical forecasting techniques. The MPO which created the estimates used in this analysis is the Southern California Association of Governments (SCAG). The SCAG population growth projections take the SOAR restriction into account. In order to accommodate the growth predicted by census tract, it was necessary to overlay the census tract with the available land.

This analysis places the census tract level projections for future population growth, within the undeveloped land in the SOAR boundaries. A historical density ratio was

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[34] Caltrans website, CTIS page, available at http://www.caltrans.ca.gov/hq/tpp/offices/osp/ctis.html, accessed on October 26, 2007.

[35] California State Department of Conservation Farmland Mapping and Monitoring Program, available at http://www.conservation.ca.gov/dlrp/fmmp/Pages/Index.aspx, accessed on March 24, 2008.

ascertained for each city. The resulting density is representative of the current built environment (i.e. the same distribution of municipal, industrial, residential and open space). The inverse density (acres per population) was applied to the cities' population growth projections to determine the acres required to accommodate the increase in population. It was assumed that development would occur uniformly within the available land. Future development would spread into greenfield areas (i.e. previously undeveloped land) within the SOAR boundaries, unless there was not sufficient available area to support the projected population (at historical density ratios), in which case density would increase or redevelopment would occur. Therefore this analysis assumes greenfield and redevelopment must comply with the same requirements under the PCGP.

Furthermore, Notice of Intent (NOI) data were used to determine the historic ratio of development types. SWRCB's NOI data list all construction activity that took place in California between 1992 and 2007. For the purposes of this analysis it is reasonable to assume that future development will resemble past development given similar characteristics of the data over time.

The data were assessed for Ventura County to determine the percentage of different construction types – commercial, residential, industrial, and mixed use – and the respective size of these development types, i.e. less than 50 acres and greater than 50 acres. Size is an important factor in the analysis because it informs both the predicted period of delay and the site's risk category. The risk category is in part a function of exposure to rain events which is determined by site size (larger sites take longer to complete and are more likely to fall into one or more rainy seasons). The spread of development types was ascribed to every location within the study area that is likely to be developed.

Table 3: Total Area Projected for Development 2008-2030 in Ventura County

City	Population Growth	Developed Area
Camarillo	22,003	4,470
Fillmore	3,405	389
Moorpark	4,654	1,639
Oxnard	25,618	2,229
Santa Paula	11,788	1,192
Simi Valley	11,842	2,514
Thousand Oaks	6,437	1,869
Ventura	10,156	1,344
Total	**95,900**	**15,645**
Total Land Available to be Developed under SOAR: 50,190		

As shown in Table 3, most of the anticipated development projects are located in the cities of Camarillo, Simi Valley, and Oxnard. The City of Ventura is constrained in its development by the SOAR boundaries, however, all other cities have ample room to accommodate the expected population within the study period.

3.3 Identification of Risk Categories and Permit Requirements for Projected Development and Transportation Projects

Future road construction and development projects located within proximity to a sensitive receiving water body are likely to be classified as high risk.

This study used data on the soil characteristics, the location of receiving waters, and applied historic data to estimate the size of future development. According to the risk calculator, a medium or high risk site has a point score of at least four on the risk calculator. This analysis used a risk formula based on the elements of the risk calculator for which data were available and applied probabilities to uncertain factors – whether a site will be exposed to one or more rain events. Note that risk category is in part a function of exposure to rain events which is determined by site size (larger sites take longer to complete and are more likely to fall into one or more rainy seasons). Therefore, sites otherwise classified as low risk would likely be pushed into the medium risk category if they were exposed at any time to a wet season.

An iterative approach was used to determine which sites are likely to be medium or high risk. In the first iteration, sites were determined to be medium or high risk by assessing their soil type and whether they were located in close proximity to a receiving water body (within 500 feet) – in which case they received a risk score of at least four. In the following round, soil type and a series of buffers to a receiving water body (up to 1,000 feet) deemed a project at least medium risk, given it had a score of three. In the following rounds, the probability of a site being greater than 50 acres was applied (63 percent) to low scoring sites, in which case the site was deemed to be medium risk or greater. The remaining sites were said to be low risk.

The requirements to comply with the PCGP are equivalent for medium and high risk sites. Compliance requirements with the previous CGP were independent of the current risk classification. As a consequence, this analysis uses site size as the basis for determining costs to comply with the previous CGP and PCGP, for sites less than and greater than 50 acres. A characteristic average site size was chosen for each size class based on the SWRCB NOI data. For sites less than 50 acres an average site size of six acres was used and for sites greater than 50 acres, an average site size of 150 acres was used. This method is also substantiated by evidence from previous studies on compliance with the PCGP that examine the importance of economies of scale.[36]

Calculating the expected costs of future development requires calculating the expected area of greenfield development and the distribution of that development in the different risk categories. However, the requirements under the PCGP are site specific. In order to account for that dynamic a weighted average of development types was applied to the calculated areas in each risk category. While it is impossible to know the exact location of each development project and size class, knowing the total area with development potential and the share of past development types and their corresponding size, it can

[36] Geosyntec Consultants, "Evaluation of Active Treatment Systems (ATS) for Construction Site Runoff," November 6, 2007.

safely be asserted that future projects are likely to mimic past projects. Thus, by taking the total area projected for development calculated for each risk classification, the costs can be applied on a per acre basis for development type (less than fifty or greater than fifty acres), yielding the total expected cost of all new greenfield construction in the study area.

4. Baseline and Incremental Economic Impacts

This analysis calculates a baseline, which is defined as the past impacts incurred to comply with the previous General Construction Permit. Incremental impacts are those that are attributable to complying with the PCGP above and beyond the requirements that would have been completed under the previous permit. The costs of implementing BMPs are available from the EPA, bioenvironmental consultants, and from the California Stormwater Quality Association. Guidance on which BMPs would be used at different construction sites was provided through communication with local developers and consultants. BMP usage is dependent on a site's soil characteristics, slope, rain events and site size. The Results section provides a list of the project requirements necessary to comply with the different regulations that were calculated in this economic analysis.[37,38]

Many of the assessed impacts are directly attributable to the PCGP, such as the cost to the developers of a medium or high risk construction site to implement Advanced Treatment System (ATS) technology. However, certain impacts may be attributable indirectly to the PCGP such as delay costs resulting from SWPPP review and phased grading.

4.1. Estimating Delay

The period of delay is assumed to be a uniform 90 days for all projects due to the SWPPP review period, as required by the PCGP. This analysis ascertains delay given a full 90 day wait period, requiring that construction cannot commence prior to SWPPP approval. While projects may experience further delay if there are complications with or opposition to their SWPPP, the probability of this occurring and the amount of further delay is too hypothetical to predict. In addition, phased grading may cause additional project delays, particularly for larger construction sites. Grading delays are only associated with projects that implement source control options in lieu of ATS. Delays due to grading are assessed on a project by project basis, based on the size of the construction site. As stated before, given a five acre restriction on grading, a 100 to 150 acre project may take two to five times as long to complete. Delay costs are included in the incremental impacts.

[37] Personal communication with Kim Williams of Geosytnec Consultants, on January 29, 2008.
[38] Personal communication with Jerry Pabbruwee of Sukut Construction Inc., on January 8, 2008.

4.2. Aggregating Costs

In the context of this analysis, variable costs are those costs that change according to changes in construction site size. That is, a cost of $500 per acre given an increase of one acre in site size will increase the total cost by $500. This analysis calculates all variable costs of future projects to comply with the previous permit and the PCGP. Costs are calculated on a per acre basis for sites less than and greater than fifty acres. Fixed costs (costs that are incurred on a per site basis) were converted to a per acre designation. This was done by determining the percent of the total acreage projected for development that is for sites less than fifty acres or alternatively for sites greater than fifty acres. The ratio was multiplied by the average site size within these categories, and by the per acre cost. Costs are then aggregated across all the acres projected for development in the study area to estimate the baseline and incremental impacts.

4.3 Discounting

All future impacts are presented in this report using a real discount rate. This discounting represents the value of a payment or a stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in terms of today's dollars. Translation of economic impacts of past and future costs to 2008 dollars requires the following information: a) projected future costs of compliance with stormwater regulation; and b) the specific years in which these impacts have been or are expected to be incurred. For the purposes of this analysis, all development is expected to occur uniformly within the study period 2008-2030. [39] All transportation projects are expected to occur uniformly within the period 2008-2014, which is when the highway construction projects in question are scheduled to occur.

With these data, the present value in 2008 dollars of the past or future stream of impacts of stormwater compliance efforts (PV_c) from year t to T is measured according to the following standard formula: [40]

$$PVc = \sum_{t}^{T} \frac{Ct}{(1+r)^{T-t}}$$

Where C_t is the cost of compliance efforts in year t and r is the discount rate.

This analysis uses a five percent discount rate which is the average of the discount rates that the Office of Management and Budget (OMB) recommends. To discount and annualize costs, OMB specifies the use of a real rate of seven percent. In addition, OMB recommends sensitivity analysis using other discount rates such as three percent, which some economists believe better reflects the social rate of time preference.[41]

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[39] Impacts were calculated to 2030 (a 23 year time frame) because future impacts can accurately be projected for that time period. SCAG projects housing and population to the year 2030.

[40] To derive the value in 2008 dollars of future compliance efforts, t is 2008 and T is 2030 for development and t is 2008 and T is 2014 for transportation projects.

[41] U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 *Federal Register* 5492, February 3, 2003

III. Results

1. Case Study Results

This section of the report discusses the model results, delineating the impacts to comply with permit requirements for new construction from 2008 to 2030. Total baseline and incremental impacts are calculated for sites less than fifty and greater than fifty acres in present value. Per acre impacts are presented in undiscounted terms to reflect the current cost of compliance with stormwater regulations. The impacts of the regulations on each development type by project size are outlined below.

2. Projected Construction

Using GIS it is possible to extract the most probable location for future development to occur. As a result, areas which are already urbanized or outside the SOAR boundaries are excluded from the analysis.

The compliance costs under the current CGP consist of developing and submitting a SWPPP, BMP implementation, BMP maintenance, and submitting an annual report to the SWRCB. The stormwater requirements under the PCGP consist of developing and submitting a SWPPP, minimum BMP requirements or enhanced BMPs, implementing ATS technology or source control requirements, NEL or AL monitoring, BMP maintenance, developing and maintaining a REAP, and submitting an annual report to the SWRCB. Indirect costs that result from the new requirements are those resulting from delay periods. These delay periods are specific to the SWPPP review period and the five acre grading restriction (that is included in the source control requirements). Every construction project will experience delay costs for the SWPPP review period and those projects not using ATS will be subject to the grading delay.

Table 4 shows the costs that are incurred under the various scenarios. CGP requirements and requirements for low risk sites are shown in the first column. Low risk sites are subject to the same requirements under the PCGP as all sites were under the CGP. Requirements for medium and high risk sites are not differentiated under the PCGP. Medium and high risk sites under the PCGP will either use ATS or source control options in addition to other requirements shown in columns two and three.

Table 4: Expected Permit Requirements		
Baseline-CGP	**With ATS - PCGP**	**Without ATS - PCGP**
Minimum BMPs	ATS	Grading delay
BMP monitoring	Enhance BMPs[1]	Enhanced BMPs[1]
SWPPP	BMP monitoring	BMP monitoring
Annual reporting	SWPPP	SWPPP
	SWPPP delay	SWPPP delay
	NEL monitoring	NEL monitoring
	AL monitoring	AL monitoring
	ALEER	Stabilized entrances
	Standard BMPs[2]	Standard BMPs[2]
	Photo monitoring	Perimeter control
	Annual reporting	Soil Cover
	REAP	REAP
	REAP monitoring	REAP monitoring

Notes:
(1) Enhanced BMPs = suite of BMPs that are required under the PCGP.
(2) Standard BMPs = suite of BMPs that are required under the CGP.

2.1 Transportation

Projected transportation projects were selected based on details from the Caltrans CTIS2 database and local Caltrans District 7 information. Project sites that were described as "road widening" or "HOV lane addition" were expected to have a significant amount of exposed soil to illicit requirements under the PCGP. Risk assessments were then conducted based on soil characteristics and proximity to impaired receiving waters to calculate expected costs under the PCGP. The unique nature of transportation construction requires a different calculation with respect to exposed area. Road construction is done in segments limiting the amount and duration of exposed soil.

The future transportation projects outlined by the Caltrans CTIS2 database and Ventura County COG selected for this analysis are the road widening project along Highway 118 between the LA county line and Highway 23 and the High Occupancy Vehicle (HOV) lane addition along Highway 101 near Santa Barbara County. The HWY 118 widening project is approximately 15 miles long. The section of the HOV lane project on HWY 101 that is within the Ventura County boundary is five miles long. These road construction projects are generally undertaken in five mile increments. It is estimated that one five-mile segment takes between 1.5 and two years to complete.[42]

Thus while most of the soil characteristics and the proximity to water for these road projects would result in a risk category of low to medium, the multiple rainy seasons

[42] Personal communication with Ron Kazinsky, CalTrans District 7 Deputy District Director for Environmental Planning, on January 29, 2008.

through which these projects will be occurring, increases the risk category to at least medium to high.

Figure 2 below shows the transportation projects of interest and the location of areas likely to be classified as high risk in Ventura County.

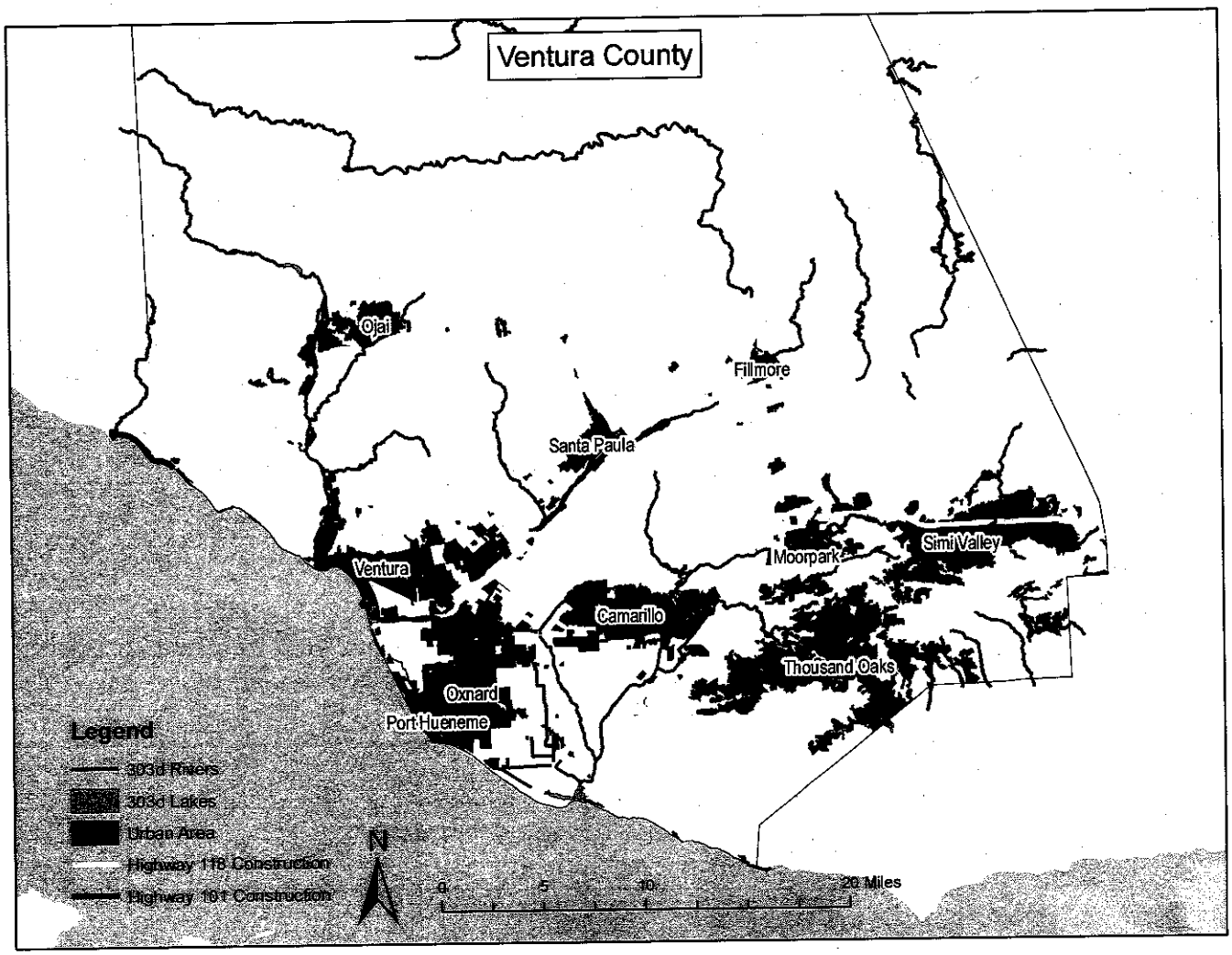

Figure 2: Projected Transportation Projects and High Risk Sites

2.2 Development

The expected cost for new development to comply with the CGP and PCGP consists of multiple parameters. Development projects are divided into categories based on the SWRCB NOI database. The categories are commercial, industrial, residential, transportation, utility, residential and commercial, and commercial and industrial, and unspecified (misc.). The residential and commercial as well as the commercial and

industrial categories refer to mixed use development projects. Each development project category is additionally classified by size in order to better represent the BMP cost characteristics. For the purposes of this analysis the stormwater compliance requirements for each category of development are assumed to be the same.

Table 6 below shows the distribution of development types and their likely risk classification under the three scenarios of growth restrictions. In order to categorize the total area of development that resulted from the GIS analysis, representative statistics were generated from the SWRCB NOI database. It is assumed that new development will mimic old development patterns.

Table 6: Acres of Types of Development Projects

Type	Residential	Commercial	Industrial	Utility	Transportation	Misc.	Res./Comm.	Comm./Ind.
High Risk	6,453	1,562	705	349	133	3,456	1,380	281
Low Risk	592	143	65	32	12	317	127	26

Figure 3 shows the undeveloped areas within the SOAR boundaries, location of future transportation projects, 303d listed water bodies and ecologically sensitive areas. Future road construction and development projects located within proximity to a sensitive receiving water body are likely to be classified as high risk.

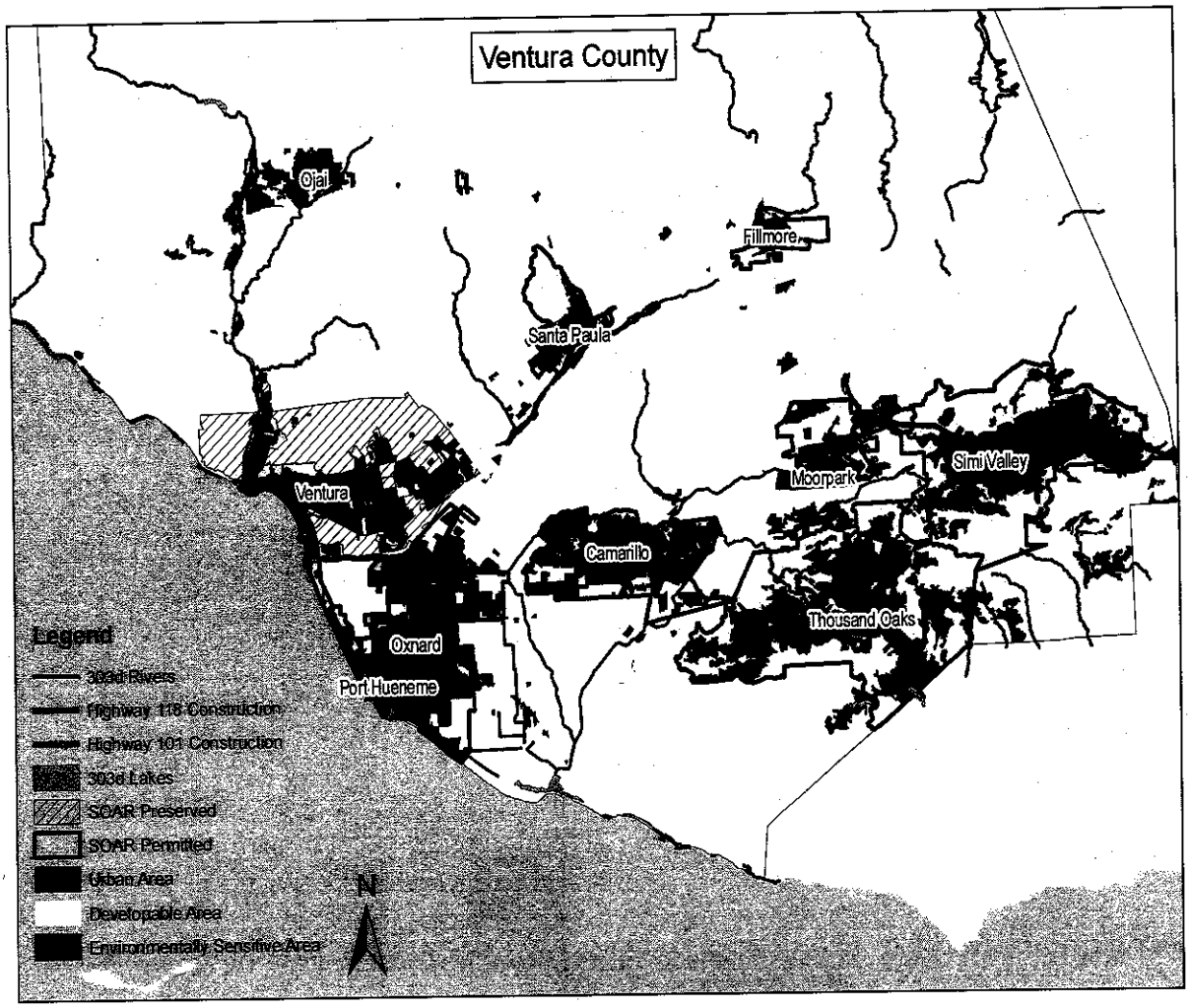

Figure 3: Projected Development and Areas Classified as High Risk

Given the characteristics of the projected development and road projects with respect to proximity to receiving water bodies, soil quality, and site size nearly all future construction sites are likely to be classified as medium or high risk (92 percent).

3. Requirements

Construction projects must undertake various requirements to comply with the CGP. The following sections provide a summary of the requirements under both the CGP and the PCGP. Compliance requirements are generally site specific. The development of the SWPPP is expected to delineate the appropriate specifics for compliance. Even though BMP costs are specific to site characteristics, for the purpose of this analysis average BMP costs were used to represent compliance costs for all future development.

3.1 Previous Permit

The baseline requirements under the CGP are installation of BMPs, BMP maintenance, SWPPP, and preparation of an annual report. The associated costs are calculated on a per acre basis.

3.1.1 Description of BMPs Given Ventura County Characteristics

The site specific nature of BMP implementation makes estimating appropriate BMPs complex. Given various studies and conversations with contractors and regulators, average BMP costs were estimated. In some cases only total BMP costs were available for a given site. Thus it was not possible to differentiate BMP cost by specific site characteristics such as slope and soil quality. If a developer had to adjust BMPs to account for a steep hill near a stream or river, costs would likely increase significantly.[43] As a result, the estimates that proceed are a lower bound estimate for expected costs of compliance. This analysis uses the terminology "standard BMP" to refer to those BMPs implemented under the CGP, and "enhanced BMP" for those required under the PCGP.

3.1.2 Predicted BMP Usage Given Site characteristics

Given the reference information available, the standard BMP cost for a hypothetical 27 acre site is $2,284 per acre.[44] This consists of a perimeter silt fence, sediment traps (gravel bag), gravel bag chevrons, inlet protection, fiber rolls (9"), stabilized construction entrance, and street sweeping. This is the cost applied to every acre of development that is expected to occur in the future, regardless of the total size of the project.

3.2 PCGP

New requirements in the PCGP include the addition of risk assessment, SWPPP review, ATS, REAP, and grading restrictions. The increased water quality requirements are expected to render standard BMPs insufficient. As a result utilizing enhanced BMPs, typically consisting of greater quantities of minimum BMPs, is expected to provide better compliance with the PCGP. The expected cost per acre for enhanced BMPs is $4,300. This figure is based on the same hypothetical 27 acre site as described above; essentially doubling the BMPs listed above to provide extra durability in a storm event. In addition, sites are required to use ATS technology or source control requirements. ATS technology is expected to cost approximately $13,000 per acre for the same hypothetical site design used above. This includes standard BMPs and effluent monitoring. Alternately for a site over 50 acres the costs are expected to be $8,278. There is significant cost savings when treating effluent from larger sites of approximately 32 percent. This is due to the scale of treatment systems capacity.[45]

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[43] Geosyntec Consultants, "Evaluation of Active Treatment Systems (ATS) for Construction Site Runoff," November 6, 2007

[44] *Ibid.*

[45] *Ibid*

3.2.1 Low Risk

A low risk classification suggests a site is greater than 500ft from an impaired receiving water body, construction will not occur during a rainy season, and the soil characteristics are favorable. There is not expected to be a significant number of these sites throughout Ventura County. This analysis expects that there will be minimal compliance costs (increase costs from CGP to PCGP) for low risk sites in the study area due to the relatively low cost of compliance per site and the improbability that any sites will be classified as low risk. The compliance requirements for the low risk sites under the PCGP are visual monitoring, REAP, and submitting an annual report. Costs are thus expected to resemble baseline conditions outlined below.

3.2.2 Medium Risk

Medium risk sites can attain this classification from multiple attributes. In general, as long as the site is greater than 500 feet from an impaired receiving water body and that soils will be exposed during at least one wet season, the site will fall into this category. Sites classified as medium risk will have to comply with all new stormwater requirements described above.

3.2.3 High Risk

High risk sites are classified based on any part of the development lying within 500 feet of an impaired receiving water body and its construction typically extending into multiple wet seasons. Sites classified as high risk will be required to implement the new stormwater requirements as described above.

91.53 percent of the area projected for developed in Ventura County is likely to be classified as medium or high risk and 8.4 percent is low risk. Due to data unavailability the remaining 0.07 percent is uncertain.

4. Impacts

The baseline costs for new development in the Study Area are representative of the cost of future development to comply with the current CGP. The estimated cost of future development and transportation projects to comply with the current stormwater requirements are approximately $47.3 million between 2008 and 2030. This is equal to the present value of the total acres of new development and road construction multiplied by the cost per acre for compliance with baseline requirements. This baseline cost is used to compare to the incremental cost for compliance that result from the PCGP.

The incremental cost is the additional cost incurred for construction projects above the baseline compliance costs. The cost is calculated by subtracting the baseline CGP costs from the compliance costs of the PCGP. The resulting incremental cost also includes the delay cost associated with the SWPPP review period and phased grading. Due to the specifics of the PCGP the SWPPP delay is applied to all new projects while the grading delay is specific to sites that choose not to use ATS. Thus, incremental costs are represented under two scenarios, sites with ATS and sites without ATS. The incremental

cost for sites using ATS (in both development and transportation projects) is approximately $257 million.[46] For sites without ATS the incremental cost is approximately $1.7 billion. Therefore, all developers will choose to use ATS technology. Note that all costs are discounted as described in the Methodology section. Much of the calculated impacts are attributable to delay, as shown below.

4.1 Transportation

There are a total of 20 miles of transportation projects with secured funds in Ventura County. BMP implementation requirements under the baseline are calculated from the Caltrans BMP database and costs are applied using the CASQA construction handbooks. The 20 miles of transportation construction is estimated to cover 72 acres of exposed soil. Caltrans has its own permit which this analysis uses to assess the baseline. Incremental impacts are calculated as the additional requirements for a new Caltrans permit to comply with the PCGP. Reliable Ventura County transportation data is only available until 2014 and hence impacts are assessed between 2008 and 2014.

Transportation costs are specific to requirements outlined by Caltrans. The risk categories and hence compliance requirements are unique for transportation projects. Due to the project duration for transportation construction nearly all sites would be classified as medium or high risk. Given the risk classification, compliance would entail implementing all of the additional requirements under the PCGP. The cost per acre of baseline BMPs is approximately $156,000. The increased cost of complying with source control requirements stems from the increased per acre cost of using stabilized entrances ($407 per acre), perimeter controls ($850 per acre) and soil cover ($2,000 per acre). ATS technology has not been studied extensively for transportation projects. It is thus assumed that per acre costs are equivalent to those for residential development.

All transportation projects are predicted to experience impacts from delay for the 90 day SWPPP review. Additionally, projects not implementing ATS technology and that use source control options will experience delays from phased grading. Transportation delays are measured differently than development delays because Caltrans is a public service agency and is not maximizing profit. Rather there is a loss in consumer surplus for commuters caused by the delay in decreased travel time from adding HOV lanes or expanding the highway. To compute the per acre cost of delay this analysis estimates the impacts of delay on the Highway 118 HOV lane addition. Delay time is estimated at approximately nine months to complete the 15 miles of road using phased grading. The lost surplus is measured by multiplying the commuter valuation of adding an HOV lane, measured at $325 per commuter per year.[47] This number is multiplied by an estimate of the total travel days per year (250 days) and by Highway 118 HOV lane commuter

[46] This figure is the total incremental cost of development for all site sizes and transportation projects (less than 50 acres + Greater than 50 acres + Transportation = Total Incremental Cost).
[47] Cy Ulberg, "An Evaluation of the Cost Effectiveness of HOV Lanes," from Washington State Department of Transportation. Accessed at http://www.wsdot.wa.gov/Research/Reports/100/121.1.htm on February 6, 2008.

statistics during peak commute times (5,843 commuters).[48] The per acre cost of transportation delay is thus estimated at $55,000.

The baseline cost to comply with the previous CGP is approximately $9.4 million dollars. The expected cost to comply with the PCGP stormwater requirements is approximately $11.8 million if developers use ATS and $15 million without. Incremental costs are $2.4 million using ATS ($40,520 per acre) and $5.2 million without ($86,410 per acre). The difference is almost wholly due to the cost of delay. However, the impacts of delay would never be borne because Caltrans is predicted to choose the cheaper option and use ATS technology.

Table 7: Estimated Cost of Compliance for Transportation Projects			
	Total PCGP	**Incremental**	**Incremental per Acre**
PCGP with ATS	$11,800,000	$2,440,000	$41,000
PCGP without ATS	$14,600,000	$5,190,000	$86,000

4.2 Development

According to the model results the total cost to comply with permit requirements for new development construction from 2008 to 2030 under the current baseline requirements is approximately $38 million; $2,520 per acre for sites greater than fifty acres and $6,879 per acre for sites less than fifty acres.[49]

Table 8: Total Estimated Cost of Compliance for Development Projects		
Total Cost	**< 50 Acres**	**> 50 Acres**
Baseline	$23,400,000	$14,600,000
With ATS	$543,400,000	$820,400,000
Without ATS	$550,200,000	$2,243,900,000

The incremental cost of development under the PCGP is approximately $254 million for both site types using ATS technology; $26,000 to $38,000 per acre for sites greater than and less than fifty acres, respectively.[50]

Table 9: Per Acre Incremental Costs for Development Projects		
	< 50 Acres	**> 50 Acres**
With ATS	$38,000	$26,000
Without ATS	$40,400	$296,300

[48] CalTrans District 7, HOV Annual Report, accessed at http://www.dot.ca.gov/dist07/resources/hov/, on February 6, 2008.
[49] Lower bound estimates are calculated using the Scenario 2 sum of baseline impacts and upper bound estimates are the sum of Scenario 1 baseline impacts.
[50] Totals may not sum due to rounding.

Table 10: Total Incremental Costs for Development Projects		
Total Cost	**< 50 Acres**	**> 50 Acres**
With ATS	$120,000,000	$134,300,000
Without ATS	$126,900,000	$1,557,800,000

The amount of these impacts that is attributable to delay is shown below in Table 11.

Table 11: Estimated Impacts of Delay for Development Projects						
Delay Type	Acres projected for development	Delayed Profit (in millions)	Interest Rate	Years of Delay	Loss (in millions)	Loss per acre
Grading LT50	5,353	$9,745	0.07	0.10	$66	$7,247
Grading GT50	8,966	$16,321	0.07	3.63	$4,152	$271,555
SWPPP	15,645	$28,478	0.07	0.25	$498	$18,682

The incremental costs per acre for sites less than fifty acres are approximately $26,000 to $38,000 if the developers use ATS or $40,000 to $296,000 without. Therefore, all developers would always choose to use ATS technology.

5. MS4s

In addition to complying with the PCGP it is estimated that future households projected in this analysis will also have to comply with the Ventura County Permit for MS4s. The cost per household to comply with an MS4 permit is estimated to be between $18 and $46 per household. These costs are based on the California State University of Sacramento study that surveyed five California municipalities and one metropolitan area with stormwater programs that is demonstrating meaningful progress toward maximum extent practicable (MEP) compliance as identified by Regional Water Quality Control Board (RWQCB) staff. Demonstrating meaningful progress was defined as implementing activities specifically presented in the Storm Water Management Plans (SWMPs).[51]

This analysis projects a total of 495,434 new households in the study area between 2008 and 2030. Applying the estimated per household cost of MS4 compliance to the projected households yields a range of approximately $8,918,000 to $22,790,000.

6. Conclusion

The PCGP will cost $256 million in 2008 dollars in Ventura County over the study period. The total incremental cost of the PCGP is $2.4 million for transportation and $254 million for development projects. Note that the two costs are not comparable because

[51] Office of Water Programs at California State University, Sacramento, "NPDES Stormwater Cost Survey," January 2005.

transportation impacts were ascertained for projects between 2008 and 2014, while development project impacts were calculated between 2008 and 2030.

Table 12: Impacts of Compliance with the PCGP (in millions of dollars)			
	Baseline Cost	Incremental Cost	Total Cost
Transportation	9.4	2.4	11.8
Development	38	254	292
Total	47.3	256.8	304.1

Table 13: Per Acre Impacts of the CGP and PCGP			
		Baseline Cost	Incremental Cost
Transportation		156,253	40,520
Development	< 50 Acres	6,879	38,000
	>50 Acres	2,520	26,000

Per acre costs provide a reliable estimate of the additional cost posed by the PCGP to construction activity. The PCGP will increase the cost of managing stormwater at project sites by a factor of six to eleven, relative to the current permit. For development projects, the PCGP costs are between $26,000 and $38,000 per acre, depending on the size of the project. For transportation projects, the cost of complying with the PCGP is $40,000 per acre over the cost of current regulations.

Appendix A: The PCGP Risk Calculator

Table 1: Risk Calculator

A	Total Period of Planned Construction with Exposed Soils	Assigned Point Value (Enter corresponding value in column D)
	[redacted]	
2	[redacted]	2
	[redacted]	

B	Hydraulic Connection to Sensitive Receiving Waters	Assigned Point Value (Enter corresponding value in column D)
	[redacted]	

D	Soil Analysis - R Factor	Assigned Point Value (Enter corresponding value in column D)
	[redacted]	
2	[redacted]	2
	[redacted]	

E	Soil Analysis - K Factor (weighted average, by area, for all site soils)	Assigned Point Value (Enter corresponding value in column D)

F	Soil Analysis - LS Factor (weighted average, by area, for all slopes on-site)	Assigned Point Value (Enter corresponding value in column D)

G	Soil Analysis - Hydrologic Soil Group (dominant soil group - if equally divided, use average value from corresponding point assignments)	Assigned Point Value (Enter corresponding value in column D)

Low Risk = 1 - 3

Standard Risk = 4 - 9

High Risk = 10 +

Appendix B: Estimating Delay Costs

Delay time is assumed to be equal to a uniform 90 day period of SWPPP review for all future development. Additionally, further delay time is expected for those sites not employing an ATS. Two scenarios are constructed to represent this occurrence – delay cost for sites less than 50 acres and for sites greater than 50 acres. This analysis applied a weighted average of development sizes using data from past stormwater NOI applications and developers' estimates on grading time, to estimate the grading time for sites under and over 50 acres given the grading restriction. It is likely that sites less than 50 acres will experience a delay due to grading of approximately one month. This is the additional time that projects will take due to complete given the five-acre grading restriction. Sites greater than 50 acres are expected to take approximately 43 months or three and a half years longer to complete than without the grading restriction.[52]

The welfare cost of delay is measured by assuming that economic surplus generated by development could have been invested at the market interest rate. Moreover, the SWPPP review process and grading delay exposes the developer to additional uncertainty about the magnitude and timing of development. This analysis assumes that delay cost is measured with a seven percent rate of interest; this is a conservative rate less than the rate that is commonly used by developers to value a risky cash flow. Mathematically, delay costs are computed by multiplying the period of delay (three months for SWPPP and an additional grading period of 0.09 or 3.63 years (depending on site size)) by the surplus from development (the extensive margin value of land) and by the interest rate.

[52] Personal communication with Jerry Pabbruwee of Sukut Construction Inc., on January 8, 2008

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SAN GABRIEL UNIFIED SCHOOL DISTRICT

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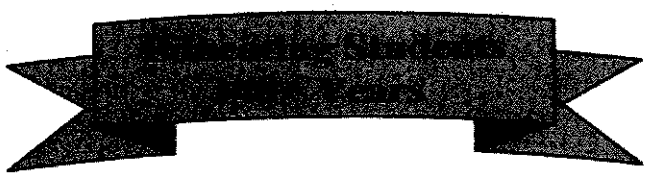

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June 9, 2008

Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street
Sacramento, CA 95812

Dear Ms. Townsend:

The Draft Storm Water Construction General Permit (Draft Permit), proposed by the State Water Resources Control Board (SWRCB), will cause severe financial problems for the San Gabriel Unified School District and will take away funds reserved to educate children in our schools! Additionally, the Draft Permit will result in the delay of the construction of needed classrooms, if my district is required to incorporate new post-construction design requirements and implement new on-site monitoring and reporting processes.

Our school district has four new construction and modernization projects already designed and/or partially approved by the Division of the State Architect (DSA), Office of Public School Construction (OPSC), the California Department of Education (CDE), and/or the State Department of Toxic Substances Control (DTSC), and would have to spend tens of thousands of dollars to comply with the Draft Permit.

OPSC has stated that expenses related to site monitoring, water sampling, action exceedance reporting, annual reporting, and redesign and reconstruction to meet new post-construction requirements are not eligible for funding under the current School Facility Program. The cost of compliance would come from diverting education funds from the classroom.

Our specific concerns are as follows:

- **Projects Already In Process**

  School districts in California have over 885 pending new construction projects, all of which would be impacted by this permit. From design to completion, projects often take four to five years. The proposed implementation date for the final Construction General Permit is 100 days after SWRCB approval, with final approval expected in summer 2008. If districts are forced to redesign current projects to comply with the Draft Permit, project delays will result in the additional cost of millions of dollars statewide. It is doubtful that regional boards could review these plans without causing construction delay, and it is doubtful that the four state agencies involved in the review process would allow revised plans to go forward without another review, causing further delay and expense.

  We are requesting an exemption for those projects that are already in the approval process "pipeline." In 2003, a similar exemption was granted to school and community college districts and county offices of education for the Small Municipal Separate Storm Sewer Systems (Small MS4).

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Member

- **Prior Treatment for Small MS4**

Many of the issues and problems associated with the revision of the construction Draft Permit were presented to the SWRCB during the 2003 discussion regarding the Small MS4. The SWRCB made a number of findings for education in the Small MS4 general permit, the most significant being that school and community college districts and county offices of education are "non-traditional" permitees and, as a result, should not be treated as other "traditional" permitees.

We believe that educational agencies should again be recognized as "non-traditional" permitees. We recommend that the SWRCB designate school and community college districts and county offices of education to comply with the Six Program Areas/Minimum Control Measures and Attachment 4, respectively, of the Small MS4, which stipulate policies for areas subject to high growth or serving a population of at least 50,000 for receiving water limitations and design standards. The Post - Construction "no redesign expectation" provision should be updated to allow the same amount of exemption time (20 months) as the Small MS4.

- **Fiscal Impact**

Our district has been experiencing declining enrollment for a number of years. Fewer students translate into less funding from the state. Moreover, the Governor has proposed a revised 2008-09 budget for education that is ultimately less than the current budget. Every dollar spent on storm water programs results in less available funding for our core programs. To continue to provide a quality education to our students, we would require some type of financial relief from this added mandate.

We recommend that the SWRCB work with the State Allocation Board to provide financial relief to implement storm water permit programs.

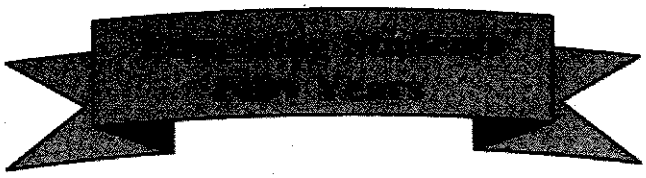
- **Addition of Regional Water Quality Control Boards to the Review Process.**

School district construction projects are already reviewed and approved by four different state agencies, (i.e., DSA, OPSC, CDE, and DTSC). By adding the regional boards to the review process, an already lengthy process will be further extended. Additionally, we are concerned that the Draft Permit does not specify a deadline for completing the regional board review process.

It is more economical and practical to have one of the above-mentioned state agencies also review the plans for storm water compliance. This is especially relevant because the regional boards have never been adequately staffed to even implement designation of school districts to participate in the Small MS4.

We recommend that: (1) the storm water construction permit and plan review function be given to one of the existing state agencies involved in performing related review activities or (2) a 30 day automatic approval be granted after the application is submitted to the regional board, if the regional board has not taken action on the application within that time frame.

SAN GABRIEL UNIFIED SCHOOL DISTRICT



The San Gabriel Unified School District requests that you consider our recommendations and respond to our concerns. Questions regarding this letter should be made to Dr. John Pappalardo at 408 Junipero Serra Drive, San Gabriel, California 91776, Pappalardo_j@sgusd.k12.ca.us, or at (626) 451-5400.

Sincerely,

John Pappalardo, Ed.D.,
Deputy Superintendent

cc: Ms. Doduc, Chair, SWRCB
Mr. Wolf, P.E., PhD, Vice Chair, SWRCB
Mr. Baggett, Jr., Member, SWRCB
Mr. Hoppin, Member, SWRCB
Ms. Spivy-Weber, Member, SWRCB
Mr. Chang, Los Angeles County Office of Education (LACOE)
Ms. Gibbs, LACOE