Controlling Cumulative Impacts from Impervious Surfaces:

ANALYSIS AND RECOMMENDATIONS FOR SANTA CLARA COUNTY

COMMITTEE FOR GREEN FOOTHILLS

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Synopsis

Cumulative changes in impervious surfaces pose a number of potentially significant threats to Santa Clara County watersheds, particularly to water quality and potential erosion. Because Santa Clara County has water bodies that are already considered "impaired," cumulative impacts present serious concerns.

Although data on impervious surface changes could be easily compiled for each new development, local governments do not currently require this information from new developments. Without an adequate analysis of impervious surface changes, the local governments cannot verify that they have avoided significant environmental impacts. New requirements under the Clean Water Act and Porter-Cologne Act address some impacts of impervious surfaces; however, these new requirements do not address all the potentially significant cumulative impacts, as is required under the California Environmental Quality Act. Changes in CEQA Guidelines require this cumulative impact analysis.

This report examines the value of tracking cumulative changes in impervious surfaces for land use planning and for mitigation of their impacts. The report describes how government agencies in Santa Clara County could incorporate this tracking into the land use planning process under the California Environmental Quality and mitigate cumulative impacts from impervious surfaces.

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This document is available online in PDF format: **http://www.GreenFoothills.org/impervious**.

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I. Introduction

Scientific evidence shows the environmental impacts from changes in impervious surfaces. Impervious surfaces can accelerate erosion and accentuate peak-flow flooding, and even in small amounts they can reduce the biological integrity of streams and reduce the quality of the physical habitat in watersheds. Studies show impervious surfaces to be extremely important in determining environmental quality.[1] The difficulty in managing impervious surface changes stems from the fact that when aggregated, even small projects have a damaging cumulative impact.

Cumulative impacts to the environment occur when relatively minor impacts from individual projects accumulate into significant impacts. For watersheds, cumulative impacts are among the most important and least-controlled environmental problem. Because these cumulative effects are not immediately apparent to decision-makers reviewing individual projects, detecting and controlling these impacts pose a management challenge.

Changes in impervious surfaces in Santa Clara County watersheds demonstrate this challenge. A typical project affecting impervious surfaces would be the replacement of a small house with a much larger one, with a larger driveway to accommodate firefighter access. At best, current permitting processes might limit the increase in impervious surfaces to keep that individual project from having an individually significant impact. To our knowledge, however, no jurisdiction in this County tracks the net change in impervious surface from each individual project to see if, when combined with data from other projects, the cumulative effect of paving over County watersheds is also significant.

Data on impervious surface changes from individual projects could be readily compiled during development approval. Impervious surface changes are some of the most easily quantifiable environmental data available and can be estimated at some point in the permitting process. The problem arises from the failure to compile the data together from individual projects and determine whether the net changes are cumulatively significant. Compiling the data would almost certainly show a "trend line" of increasing impervious surfaces in all watersheds.

A "trend line" could be strong evidence of a cumulatively significant impact when combined with other factors. Those factors include information about the amount of already-existing impervious surfaces, the potential future buildout, and the effect that imperviousness has on the particular environmental issues in that watershed. While projecting effects from reasonably foreseeable future projects would not be as easily quantifiable, the trend line from existing projects could often suffice for determining cumulative impacts.

Given the pattern of increasing development in Santa Clara County, most or possibly all watersheds in Santa Clara County have a negative trend, with increasing amounts of impervious surfaces. Confirming and quantifying this trend raises the question of appropriate mitigation for the impacts, and several solutions are outlined below.

[1] See, e.g., "Impervious surface coverage: The emergence of a key environmental indicator," Chester L. Arnold et al., Journal of the American Planning Association 62(2), Spring 1996, pp. 243-259.

II. Environmental effects of impervious surfaces

Changing Santa Clara County watersheds from vegetated ground cover that rainfall easily permeates to impervious roads, rooftops, and parking lots has well-recognized effects on the environment. The San Francisco Bay Regional Water Board recognized this in an order that began the Board's attempt to address the problem:

> Natural vegetated soil can both absorb rainwater and remove pollutants providing a very effective natural purification process. Because pavement and concrete can neither absorb water nor remove pollutants, the natural purification characteristics of the land are lost. Secondly, urban development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc., which can be washed into the municipal separate storm sewer system (MS4). As a result of these two changes, the runoff leaving a newly developed urban area may be significantly greater in volume, velocity and/or pollutant load than pre-development runoff from the same area.[2]

Because the runoff from paved areas can be significantly greater from a storm event than it would be on natural ground, the "flashing" streams can erode their banks much more quickly, damaging habitats, threatening neighboring properties and harming downstream reaches. A document created as a result of the Water Board's order to address impervious surface issues lays out this particular problem in greater detail than that found in the original order:

> As total area of impervious surfaces increases in previously developed areas, infiltration of rainfall decreases, causing more water to run off the surface as overland flow at a faster rate. Storms that previously didn't produce runoff under rural conditions can produce erosive flows.[3]

The most-discussed problems caused by increased impervious surfaces are decreased water quality and increased erosion. Other environmental impacts can also result from increased impervious surfaces, including increased flooding, increased temperatures from "heat islands," and loss of biologically useful habitat.[4]

Significant impacts can occur with "as little as a 10% conversion from natural to impervious surfaces," and that threshold can be reached with as little as one to two houses per acre.[5] These significant impacts have been specifically identified in Santa Clara County watersheds, including Wildcat Creek, San Antonio Creek, Novato Creek, San Pedro Creek, and others.[6]

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[2] Order No. 01-119, NPDES Permit No. CAS029718, Amendment Revising Provision C.3 of Order No. 01-024, California Regional Water Quality Control Board, San Francisco Bay Region (Order 01-119), at Finding 4.

[3] SCVURPPP Hydromodification Management Plan ("HMP") at 1-1.

[4] See, e.g., HMP at Appendix D-3 (statement by expert reviewer that channel stability does not necessarily imply habitat maintenance or recovery).

[5] Order 01-119 at Finding 7, citing Heaney, J.B., Pitt, R, and Field, R. **Innovative Urban Wet-Weather Flow Management Systems**, 1999. USEPA Doc. No. EPA/600/R-99/029 (Chapter 2).

[6] HMP at 1-1. See also GeoSyntec Consultants Inc., *Hydromodification Management Plan Literature Review*, 2002 (available in the HMP at Appendix B).

Significant impacts in Santa Clara County watersheds can result from single projects that have large effects individually, or from the collective effect of small projects. As discussed later in this report, individually small impacts to the environment can, in the aggregate, constitute a significant environmental impact. Impervious surface impacts can follow a similar process, where thousands of small increases from new parking lots, expanded homes and buildings, and new roads can have a cumulatively significant impact.

Because many water bodies in Santa Clara County are already considered "impaired" under the Clean Water Act, and watersheds have already been identified as impacted by impervious surfaces, the possibility of a cumulatively significant impact is likely. Approaches have been developed to address impervious surface impacts,[7] but in the absence of adequate analysis for the County watersheds, the problem of cumulative impacts may be addressed inadequately or overlooked entirely.

III. California Environmental Quality Act requirements to monitor cumulatively significant impacts – important changes made in September 2004

A. Overview of the California Environmental Quality Act

The California Environmental Quality Act protects and maintains California's environment, as stated in the law itself.[8] Like the National Environmental Policy Act, CEQA requires agencies to "look before you leap," to determine, disclose, and consider the potential environmental effects of their actions before making decisions on whether to move forward on particular projects. Californians expect this precautionary analysis will avoid significant impacts unless they are truly necessary.

Generally, CEQA enforces this precautionary analysis by requiring preparation of an Environmental Impact Report (EIR) for projects requiring governmental approval that may have a significant environmental effect. Courts have clarified that any substantial evidence of a significant impact suffices to require an EIR; any reasonable doubt about whether a significant impact will occur should be resolved by preparing an EIR to determine the outcome.

In addition to providing a process for analyzing environmental impacts, CEQA requires agencies to avoid or mitigate significant impacts whenever feasible. The requirement to identify and mitigate significant impacts extends beyond impacts caused exclusively by the particular project reviewed under the EIR. It also extends to impacts where the project, jointly with other projects, has a significant effect on the environment.

B. Significant cumulative impacts

California recognizes under CEQA that relatively small impacts from individual projects could be significant when the collective effect is considered. Failing to account for those impacts would defeat the purpose of protecting California's environment, so CEQA requires analysis of "cumulatively significant" impacts.

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[7] See, e.g., "Offset Banking – A Way Ahead for Controlling Nonpoint Source Pollution in Urban Areas in Georgia", available at http://www.h2opolicycenter.org/pdf_documents/; "Permeable Pavement information", available at http://www.toolbase.org/tertiaryT.asp?TrackID=&CategoryID=1323&DocumentID=2160. water_workingpapers/2002_004.pdf.

[8] Cal. Pub. Res. Code § 21000 *et. seq.*

Under the CEQA Guidelines promulgated by California's Public Resources Agency, cumulative impacts consist of impacts created as a result of the combination of the projects evaluated in the environmental documents together with other projects causing related impacts. A cumulative impact occurs when the incremental impact of a project, viewed in connection with the effects of other past, present and reasonably foreseeable future projects, is cumulatively considerable.[9]

C. Changes in legal requirements since September 2004

In September 2004, California's Public Resources Agency made important changes in the CEQA Guidelines that define when cumulative impacts are significant. These changes followed successful lawsuits by environmental groups arguing that the previous Guidelines, which were supposed to simply provide direction in how to comply with CEQA, actually contained unauthorized loopholes that allowed significant impacts to evade analysis. The new, revised Guidelines mean that agencies which may not have found significant cumulative impacts in the past may have to find otherwise for future projects, particularly in the case of impacts from impervious surfaces. Many agencies may not have incorporated the stricter, revised Guidelines into their own policies.

One Guideline clarification concerns whether compliance with regulatory standards constituted a sufficient basis for concluding that a project has no significant impact. CEQA Guideline 15064(h)(3) previously stated that no cumulative impact may occur if the project complies with a previously approved plan that "avoid or substantially lessen the cumulative problem," specifically mentioning a "water quality control plan" as an example where compliance proved that no cumulative impact occurred. Courts clarified this regulation cannot be used to exclude potential evidence of cumulative impacts that could occur despite compliance with regulatory standards such as water quality plans.[10] The revised Guideline now states that substantial evidence of cumulatively considerable impacts requires preparation of an EIR, "notwithstanding that the project complies with the specified plan or mitigation program addressing the cumulative problem."[11] CEQA Guideline revisions also deleted entirely a related provision stating compliance with an environmental "standard" sufficed to eliminate all significant impacts.

Another major change in CEQA Guidelines involved redefining cumulative impacts so that effects previously considered insignificant may now be significant. CEQA Guideline 15064(i)(4) had stated that impacts from a project are not significant if they are minimal ("de minimis") relative to a large, cumulatively significant impact. The courts found this description contravened the concept of cumulative impacts, and Guideline 15064(i)(4) has been deleted entirely.[12] While this change does not mean that any addition to a cumulative impact is necessarily significant, it does mean that small increases in impacts cannot be ignored just because the overall cumulative impact is large.

Following these changes, CEQA Guidelines now use this definition of cumulatively considerable impacts:

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[9] Pub. Resources Act § 21083(b)

[10] *Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 111-116.

[11] CEQA Guideline § 15064(h)(3).

[12] *Communities for a Better Environment*, 103 Cal.App.4th 98, 116-121.

> "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.[13]

This definition changed from a prior definition stating that effects of an individual project must be "considerable," to clarify that the effect from the project can be small, but still cumulatively significant.[14]

D. Applying new cumulative impact guidelines to impervious surface effects in Santa Clara County

Prior to the court invalidation of CEQA Guidelines in 2002 and subsequent Guideline revisions in September 2004, agencies permitting projects in Santa Clara County that create "small" increases in impervious surfaces would have had two reasons for concluding the projects had no significant cumulative impacts. First, projects complying with NPDES permit requirements and local government standards would be deemed to have met an appropriate environmental standard to avoid impacts and to have followed a water quality control plan that managed cumulative impacts. Second, the effects from small projects would have been considered "de minimis" in relation to the overall issue of impervious surfaces in the County watersheds, and therefore incapable of contributing to significant impacts. Today, however, neither reason applies, and an examination of current impervious surface regulations will show where impacts are cumulatively significant.

IV. Relationship between existing impervious surface regulations in Santa Clara County and cumulative impacts from impervious surfaces

A. Existing regulatory framework under the Clean Water Act and Porter-Cologne Act

The federal Clean Water Act and the state Porter-Cologne Act provide the primary basis for regulating water quality in Santa Clara County. The Clean Water Act requirements affect the County through National Pollutant Discharge Elimination System (NPDES) requirements. NPDES requirements affect "point source" discharges such as sewer outfalls, but they also regulate non-point source pollution, including pollution washing off of impervious surfaces. NPDES permit requirements provide general direction for water quality protection under the Clean Water Act that apply to impervious surface issues in Santa Clara County.

California state law under the Porter-Cologne Act also places mandates on water quality that affect impervious surfaces. California law established the State Water Resources Control Boards to develop and administer standards, together with nine regional boards. The San Francisco Bay Regional Water Quality Control Board has jurisdiction over the northern two-thirds of Santa Clara County, while the Central Coast Board covers the southern third.

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[13] CEQA Guideline § 15065(a)(3)

[14] The new CEQA Guidelines rely on other previous court opinions that reference cumulative impacts. Most relevant here are *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692; *Los Angeles Unified School Dist. v. City of Los Angeles* (1997) 58 Cal.App.4th 1019; *Environmental Protection Information Center v. Johnson* (1985) 170 Cal.App.3d 604. *San Joaquin Raptor v. County of Stanislaus* ((1996) 42 Cal.App.4th 608) provides context on the cumulative impact arguments rejected in *Communities for a Better Environment*.

The Regional Boards regulate water quality through waste discharge requirements based in part on NPDES permits. The waste discharge requirements have the parallel function of ensuring compliance with both federal and state law.

The Bay Regional Board sets stricter water quality requirements over impervious surfaces than the Central Coast Board. This analysis therefore focuses on the Bay Regional Board requirements for northern Santa Clara County, because any failure to account for cumulative impacts under the stricter requirements would necessarily also apply to southern Santa Clara County.

B. NPDES C.3 Permit Requirements and Hydromodification Management Plan

The Bay Water Board issued NPDES Permit No. CAS029718 for Santa Clara County in February 2001, requiring Santa Clara County cities, the County government, and the Water District to regulate water quality impacts including those from impervious surfaces. In October 2001, the Water Board issued Order 01-119, amending the permit to include specific impervious surface requirements for projects that exceed a certain size. As of June 2006, amendments to Order 01-119 are under consideration, and this report reflects the latest proposed amendments.

The specific requirements vary depending on two different size "Groups" and depending on the impact from impervious surfaces that the requirement seeks to mitigate. Projects in Group 1, also called Tier 1, include the following:

- Commercial, industrial, or residential developments that create one acre (43,560 square feet) or more of impervious surface, including roof area, streets and sidewalks. Single family residences not part of a larger development and somehow large enough to create an acre of impervious surface are exempt from this Group, provided certain conditions are met.
- All roads creating over one acre of new impervious surface.
- "Significant Redevelopment" projects adding or replacing an acre or more of impervious surface on a previously developed site.

Group 2 (Tier 2) projects involve the same 3 categories, except that the minimum size limit to incur the requirements drops to 10,000 square feet. Group 2 requirements come into effect on April 15, 2006.[15]

For both Groups, the C.3 provision treats two types of environmental impacts from increased impervious surfaces: water quality impacts from pollutants, and water quantity effects from rapid flooding ("Peak Stormwater Runoff Discharge Rates"). The water quality impacts can be reduced by capturing volume or by managing flow. In either case, none of the required "Best Management Practices" (BMPs) eliminate all potential water quality impacts.[16] For example, a volume capture could handle 80% of the annual surface runoff, and a flow management BMP could treat 10% of the 50-year peak flow rate. Excess runoff above that amount controlled by the BMPs would still occur and have potentially significant impacts.

Peak runoff limitations apply to Group 1 projects, but not to Group 2 or smaller projects. For the Group 1 projects, the Water Board's C.3 provision requires County agencies to develop a Hydrograph Modification Management Plan (HMP) to manage increases in runoff where it can cause "increased erosion of creek beds and banks, silt pollutant generation, or other impacts to beneficial uses." The HMP should not allow post-project runoff to exceed estimated

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[15] Certain Group 2 projects have earlier compliance dates.

[16] Amended Provision C.3.d.i-ii.

pre-project rates and/or durations, where the increased stormwater discharge rates and/or durations will result in increased potential for erosion or other adverse impacts to beneficial uses, attributable to changes in the amount and timing of runoff. The HMP theoretically applies to all parts of Santa Clara County that are under the Bay Water Board's jurisdiction, but erosion control does not apply in areas that are unlikely to have erosion impacts, such as highly urbanized areas with hardened (concrete-lined) stream banks.

County agencies began the process of developing an HMP through the Santa Clara Valley Urban Runoff Pollution Prevention Program, publishing the final version in March 2005.[17] The HMP appears to allow no erosion impacts from Group 1 projects for runoff events below 10 year peak flows.[18] However, the HMP will allow erosion impacts to occur if the combined costs of stormwater treatment and erosion control exceeds two percent of the project construction costs.[19]

C. Differences between NPDES standards and CEQA cumulative impacts analysis

The NPDES standards are not functional equivalents of CEQA's cumulative impact analysis for impervious surface impacts. Possibly the most important difference between the Water Board NPDES requirements and CEQA lies in the omitted coverage and analysis. The agencies do not restrict impervious surface impacts from small projects – those creating less than 10,000 square feet of impervious surface, and all single-home projects creating less than an acre of impervious surface. Peak runoff limitations only apply to projects creating more than an acre of coverage. The limited coverage does not stop the incremental effect of small projects from becoming cumulatively significant.

The water quality and flow control provisions in the new NPDES requirements do not impose a "no impact" standard, which therefore leaves open the possibility of a cumulatively significant impact. For example, the NPDES standards regarding water quality protection for Group 1 and 2 projects do not eliminate all impacts – volume capture would not treat 20% of the total annual flow from impervious surfaces. Cumulative analysis under CEQA would require the untreated 20% annual flow from each specific project to be analyzed in connection with other past and future projects to determine whether it is cumulatively significant. Similarly, other water quality regulations, such as treating 10% of the peak flow from a 50-year storm event, also fail to completely eliminate the impacts from the project, so a potential cumulative effect could still occur.

The NPDES flow control requirements for Group 1 projects also have limitations that keep them from being "no impact" standards that eliminate all potential cumulative impacts. The requirements allow for increased erosion for flows from storms that exceed 10-year events, and the HMP acknowledges that 10% of the erosion in streams comes

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[17] Hydromodification Management Plan Report, available at http://www.scvurppp.org.

[18] The HMP calculates an erosion potential (Ep) ratio for stream reaches after the project and before the project, and requires a ratio of 1.0 after mitigation. HMP at 5-3. The HMP states the chance of significant erosion must be measured considering the effects of cumulative changes in the watershed, which would presumably include future impacts. HMP at 3-19. The HMP also states that it can calculate future impervious land surfaces based on future build-out information from city and county general plans. HMP at 3-6.

This analysis has several problems. As discussed later in this report, County agencies do not assemble the available information on increased impervious surfaces, significantly limiting the ability to calculate future buildout. Second, the Ep ratio itself compares only post-project to pre-project conditions, not future conditions. As discussed below, the Ep ratio does not specify a "no impact" standard for all circumstances, so the failure to include the effect of the project under future conditions could allow cumulatively significant impacts.

[19] HMP at 5-4.

from large storms.[20] Cumulative impact analysis would require analysis of whether increased erosion from large storm events, together with erosion impacts from other projects, constituted a significant impact. The HMP does not avoid cumulative erosion impacts from projects other than Group 1 projects, and it potentially allows cumulative impacts by limiting mitigation costs to no more than two percent of construction costs.

Finally, impervious surfaces have impacts beyond water quality and channel stability. Biomass loss and increased "heat island effects" (increased urban temperatures from replacing cool vegetation with heat radiating pavement) result from impervious surfaces, as do environmental impacts from construction and ongoing maintenance of impervious surfaces. The C.3 provisions do not control these impacts and their cumulative effects.[21]

The above comments do not critique the value of the C.3 provisions and the HMP in meeting the standards set by Clean Water Act and Porter-Cologne Act. They simply indicate that these provisions may not meet the requirements of the significantly different California Environmental Quality Act for assessing cumulative impacts.

V. Changing current tracking efforts to understand cumulative impacts

Santa Clara County agencies could easily determine whether cumulative impacts result from increased impervious surface coverage. Some types of cumulative impacts are hard to quantify, but agencies can describe impervious surface impacts in quantitative form – square feet of coverage. By taking existing data in several different areas and compiling the data, agencies can readily improve understanding of cumulative impacts from impervious surfaces.

The CEQA definition of cumulative impacts could be rephrased to make it specific to impervious surfaces as follows:

> "Cumulatively considerable" impervious surface impacts means that the incremental effects of an individual project's increased surface coverage are significant when viewed in connection with the effects of past projects' impervious surface, the effects of other current projects' impervious surface, and the effects of probable future projects' impervious surface.

All that CEQA requires, at least on an initial level, is addition. Agencies add the existing surface coverage, together with the net change from new and future surface coverage, and determine whether the total is significant. While compiling data on new impervious surface coverage will not provide the complete answer on cumulative impacts, it can demonstrate a trend of increasing impervious surfaces, which will give important information on potentially significant cumulative impacts.

Data on impervious surface coverage from new projects currently exist in quantified form but need to be compiled. The two main types are data from C.3-covered Groups 1 and 2 projects, and from all other projects. While the C.3 data present the least difficulty, all of the information is obtainable.

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[20] HMP at 3-20. The HMP uses a 50-year period of historical record in its computer modeling, and appears to exclude from the 10% figure those large flow events that were not likely to occur in the historical record, such as 100-year storms. California Regional Water Board, San Francisco Bay Region, "Fact Sheet – Revised July 13, 2005" at 10 (Erosion potential calculated up the 50-year peak flow based on the period of record). The 10% figure is therefore an underestimate of the erosion effects of all flow events greater than the 10-year peak flow.

[21] See, e.g., HMP at Appendix D-3 (reviewer's statement that potential habitat impacts not necessarily prevented by the HMP).

A. Using data collected by C.3 requirements

The C.3 requirements facilitate the analysis of cumulative impacts because of the central collection of information on impervious surface projects above a certain size. Provision C.3.n requires County agencies to prepare annual reports on all Group 1 and 2 projects, and identify the square footage of new impervious surface for each project. Segregating the projects by watershed or subwatershed and then adding the net change in coverage for each watershed will show the cumulative trend for those watersheds. [22]

B. Collecting data from smaller projects

One of the main reasons for assessing cumulative impacts is to account for small projects' impacts accumulating into significant impacts, so changes in impervious surfaces from projects that do not fall into Groups 1 or 2 also need to be included. While agencies do not publish annual reports of this data, it does exist. Every final building plan should show the total amount of impervious surface coverage. Comparing that coverage to any previous coverage will show the net change, most often an increase. If an agency made the administrative decision to compile this data in a report as it does with the C.3 annual reports, with the net change organized by watershed and sub-watershed, the agency would be able to combine small projects and C.3 projects together to establish the trend for impervious surface coverage by watershed.[23]

C. Other factors in determining cumulative impacts

Cumulative impact analysis examines first, whether there exists an environmental value that may be threatened by the project; second, whether the cumulative impact of past, present, and future projects is significant; and third, whether the examined project's contribution to that collective impact is significant when examined together with the other projects. Agencies have had the most difficulty defining the third characteristic. Courts have stated that in theory an individual project's contribution to a collectively significant impact could be so small as to be insignificant, but they have rejected agency attempts to define a rule for when individual contributions are insignificant.[24] The conservative approach would treat any unmitigated increase in impervious surface from a project as significant if the agency knows a cumulatively significant impact exists.

In some cases, a trend showing two or more years of substantial increases in impervious surfaces would be sufficient to demonstrate a cumulatively significant impact. For other situations, more data may be needed, such as the existing amount of impervious surfaces in a watershed. A small increase in impervious surfaces may not be significant in a nearly pristine watershed if substantial future increases in impervious surfaces for that watershed are unlikely. On the other hand, the same size increase may be significant in a more impacted watershed. Agencies will need to use other data in these situations to determine cumulative impacts, but the trend line from impervious surfaces provides an important contribution to the analysis.

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[22] Agencies will need to share data if a watershed crosses agency borders. If not all agencies are collecting data, the lead agency for a particular project can only make the best use it can of available data.

[23] A San Francisco Bay Regional Water Board letter issued on August 10, 2005 requires exactly the type of monitoring suggested here. If the letter is not rescinded or substantially weakened, then the monitoring required under the Water Board's NPDES authority will be useful for CEQA purposes. The southern third of Santa Clara County is not under the Bay Regional Water Board jurisdiction, however, so the monitoring requirements will not automatically apply there.

[24] *Communities for a Better Environment*, 103 Cal.App.4th 98, 120.

Determining the threshold of significance for a cumulative impact may also present problems for agencies, but no more so than determining whether any other impact is significant. The C.3 Peak Runoff provision outlined in the Draft HMP may be of some help for cumulative erosion thresholds. The Draft HMP states that a 9% or greater chance of significant erosion in downstream reaches should trigger something approaching a "no impact" policy of peak runoff. Agencies could determine that any cumulative impact contributing to a significant erosion risk over 9% constitutes a significant impact. Any project contributing to a greater-than 9% risk could be feasibly described as having cumulatively significant impacts unless mitigated, but that does not mean less-than 9% risk have no significant impacts. The 9% cut-off coincides well with a "no-impact" Ep ratio of 1.0, while any Ep ratio above 1.0 quickly increases the erosion risk.[25] The HMP did not include cumulative impacts from future projects in calculating Ep, so a cumulative impact risk analysis would likely need to be more cautious.

While analyzing significant impacts from impervious surfaces could be difficult, the likely outcome of tracking and aggregating data from small projects that increase impervious surfaces will be to conclude that those projects may have cumulatively significant impacts. The two possible ways for agencies to manage this conclusion are to prepare EIRs for small projects or to require mitigation so EIRs become unnecessary. Given the expense and delay involved with EIRs, Santa Clara County agencies and project proponents both have good reason to support mitigation that would eliminate the need for EIRs.

VI. Potential mitigation for newly identified cumulative impacts

Agencies and project applicants have several options for mitigating cumulative impacts from impervious surface projects. Options include the following:

Eliminate the increased imperviousness through redesign and use of permeable pavement. This may be less difficult than it first appears, because many of the projects smaller than Group 2 projects have not had any reason to limit impervious surfaces, and therefore can cut a great deal of "fat" from impermeable surface design before it becomes difficult. While developing a project on wholly undeveloped property would have to involve a net increase in impervious surfaces, most projects would involve redevelopment like replacing a smaller home with a larger one. Redesign can reduce some of the hardscape, while replacing an impermeable driveway with permeable pavement could eliminate the net increase.[26]

Adopt the C.3 and HMP provisions for smaller projects and single-home developments. The C.3 provisions, either on-site or off-site, could be adopted for projects that have smaller increases in impervious surfaces than Group 1 and 2 projects. The HMP provisions, currently applicable only to Group 1 projects, could also be made applicable to Group 2 and smaller projects.

Pay into a mitigation fund for cumulative impacts. CEQA specifically allows payment into a fund to mitigate cumulative impacts, and a fund could be established to pay for environmental projects that that counter the effects of impervious surfaces. CEQA Guideline 15130(a)(3) states an EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair

[25] HMP at 3-17.

[26] Information on permeable pavement is available at http://www.toolbase.org/tertiaryT.asp?TrackID=&CategoryID=1323&DocumentID=2160.

share of a mitigation measure or measures designed to alleviate the cumulative impact. County agencies would need to identify facts and analysis supporting their conclusion that the contribution will make the impact less than cumulatively considerable.

Use impervious surface mitigation banking. This would take the wetlands mitigation banking concept and apply it to impervious surfaces. Projects that incidentally reduce impervious surfaces, or ones that were expressly established to reduce impervious surfaces, could sell the environmental benefit they created to balance the increased impervious surfaces from development. This concept would require some effort to put into place, but it could complement the mitigation fund discussed above.[27]

Reduce impacts that cannot be eliminated. While eliminating entirely the project's contribution to the cumulative impact from impervious surfaces should be the goal, reducing the contribution is the next best alternative. This applies to small projects as well as large ones. Even a reduction of the cumulative impact should be viewed as an improvement over the present situation, where cumulative impacts from small projects are not analyzed with the available information.

VII. Conclusion

CEQA requires analysis of cumulative impacts from impervious surfaces created by small projects, as well as large ones. Santa Clara County agencies cannot rely solely on compliance with the Water Board's NPDES requirements, because those requirements exempt small projects and do not impose "no impact" standards on large projects. To fix this problem under CEQA, agencies can use readily acquired data on changes in impervious surfaces from projects of all sizes. This data on changes in impervious surfaces will become more readily available through C.3 requirements for annual reports on Group 1 and 2 projects. CEQA analysis requires use of this data, and this use can facilitate new mitigations for currently overlooked cumulative impacts. Steps suggested in this report may lead the way to significant environmental benefits for Santa Clara County watersheds.

[27] For more information on potential examples, see "Offset Banking – A Way Ahead for Controlling Nonpoint Source Pollution in Urban Areas in Georgia", available at http://www.h2opolicycenter.org/pdf_documents/water_workingpapers/2002_004.pdf

Bibliography

California Regional Water Board, San Francisco Bay Region, "Fact Sheet – Revised July 13, 2005", available at http://www.waterboards.ca.gov/sanfranciscobay/agenda_jul_05.htm

GeoSyntec Consultants Inc., Hydromodification Management Plan Literature Review, 2002

Heaney, J.B., Pitt, R, and Field, R. Innovative Urban Wet-Weather Flow Management Systems, 1999. USEPA Doc. No. EPA/600/R-99/029

Hydromodification Management Plan Report, Final Report, Santa Clara Valley Urban Runoff Pollution Prevention Program

"Impervious surface coverage: The emergence of a key environmental indicator," Chester L. Arnold et al., Journal of the American Planning Association 62(2), Spring 1996, pp. 243-259

"Offset Banking – A Way Ahead for Controlling Nonpoint Source Pollution in Urban Areas in Georgia", available at http://www.h2opolicycenter.org/pdf_documents/water_workingpapers/2002_004.pdf

Order No. 01-119, NPDES Permit No. CAS029718, Amendment Revising Provision C.3 of Order No. 01-024, California Regional Water Quality Control Board, San Francisco Bay Region (with supporting citations)

Permeable Pavement information: http://www.toolbase.org/tertiaryT.asp?TrackID=&CategoryID=1323&DocumentID=2160

Revised Order 01-024, NPDES Permit No. CAS029718, California Regional Water Quality Control Board, San Francisco Bay Region

Watershed Management Plan, Volume One: Watershed Characteristics Report, Santa Clara Basin Watershed Management Initiative (with supporting citations)