Comprehensive Plan Update – Cumulative Impacts

Date for Discussion – October 24, 2012

Purpose

The purpose of this paper is to stimulate consideration and discussion about whether the City should establish such policies through the Comprehensive Plan Update. The Watershed Health and Environment PEG will be asked to consider issues and potential policy approaches to address cumulative impacts and carrying capacity in the future.

Introduction

Generally, the environmental impacts from one development project on an urban watershed are hard to perceive. In an urbanizing environment we see a gradual transformation of the landscape resulting from countless public and private developments that take place over long periods of time. And while the impacts of individual development projects may not be significant, the cumulative effect of incremental changes to the landscape can severely degrade environmental quality and watershed health. These impacts can also negatively affect human health, especially vulnerable populations (environmental justice communities, seniors, and children).

This is certainly true for Portland where watershed functions are degraded due to the cumulative impacts of development within the city. In addition, Portland's watersheds extend beyond city boundaries, so watershed conditions here reflect the impacts of activities occurring in upstream jurisdictions.

The City adopted the *Portland Watershed Management Plan (PWMP)* in 2006, which set goals and objectives related to watershed hydrology, water quality, fish and wildlife habitat, and biological communities. Adopted as the technical basis for the PWMP, the *Framework for Integrated Management of Watershed Health states:*

> Modification of historical flows and changes in upland land use can have many unintended and deleterious effects, as has been described above. Many of the actions taken historically by the City were ***without full knowledge or appreciation of their cumulative effects and consequences,*** many of which the City of Portland is now having to deal with (combined sewer overflows, flooding in Johnson Creek, declines of native fish and wildlife species and so on). In wetland and upland areas, the habitat loss and fragmentation associated with land use changes have impeded the dispersal of native plants and animals, decreased colonization of isolated habitats and reduced native biodiversity. (***bold/italics added)***

Portland's current Comprehensive Plan does not specifically call for consideration of cumulative environmental impacts in City land use planning or the review of proposed development projects.

Note: While this paper focuses on addressing cumulative impacts on ecological systems, other resources and areas that could be considered include human health, socio-economic resources, recreation, quality of life, and cultural, scenic, and historic resources.

A Few Definitions

In the contemporary field of environmental management, the term "cumulative impacts" took on new importance and standing with the establishment of the National Environmental Policy Act (NEPA) on January 1, 1970. NEPA requires analysis of environmental impacts, including cumulative impacts, of federal projects (or projects that will involve the use of federal dollars). The Council on Environmental Quality (CEQ) definition is as follows:

> **CEQ Regulation 1508 Terminology and Index, Sec. 1508.7 Cumulative impact.**
> "*Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions…Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (1)*

The Environmental Protection Agency provides the following guidance: "cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. It is the combination of these effects and any resulting environmental degradation that should be the focus of cumulative impact analysis..." (Environmental Protection Agency, 1999)

Since NEPA was established, a number of states, including Washington and California, have established NEPA-like laws. In these states, state agencies and local governments are required to analyze the environmental impacts, including the cumulative impacts, of certain types of plans and projects. A couple of examples are provided in Attachment A. Although Oregon has not established NEPA-like laws, cumulative impacts are mentioned in Metro's Urban Growth Management Functional Plan definitions:

> **Metro Urban Growth Functional Plan, Title 10, Functional Plan Definitions**
> (ccc) "Significant negative impact" means an impact that affects the natural environment, considered individually or cumulatively with other impacts on the Water Quality Resource Area, to the point where existing water quality functions and values are degraded.

This definition comes into play in Title 3, Water Quality and Flood Management, which includes a provision requiring cities and counties to "prohibit development that will have a significant negative impact on the functions and values of the Water Quality Resource Area, which cannot be mitigated…"

Discussion

It is helpful to begin this discussion by reviewing some common environmental impacts associated with urban development in Portland (residential, commercial, industrial, institutional) and infrastructure projects (e.g., roads, pipelines). Generally, development results in incremental increases in impervious area, removal of trees and vegetation, and alterations of topography (e.g., grading, fill), which in turn are associated with:

a. increased stormwater runoff and associated stream channel down-cutting, bank erosion, pollution and sedimentation of waterways and wetlands, and flooding

b. increased surface water temperature and associated reduction in dissolved oxygen resulting in harm to native fish and aquatic ecosystems

c. increased air temperature, which can increase ground level ozone and aggravate human respiratory ailments and disease

d. potential increases in flood-related impacts

e. reduced shallow water habitats as a result of in-water development and river dredging

f. reduced groundwater recharge, affecting the quantity and quality of summer streamflows

g. lost wetlands, oak woodlands, bottomland forests, and other rare or declining habitats

h. increased erosion and risk of landslides in steeply sloped areas

i. impacts on native fish, wildlife, and plant species, some of which are at risk or have cultural value

j. reduced air quality due to emissions from additional traffic or industry

k. increased point and non-point pollution of rivers and streams

l. increased noise, light and vibration

m. reduced scenic quality

The City has regulations that address some of these impacts for new development. However, considerable development occurred prior to current City regulations and even the regulations do not always fully address the incremental impacts of new development (see below). Over time, these incremental impacts have substantially altered Portland's landscape, affecting the quantity, quality, and functionality of natural resources, and overall watershed health.

How does the City currently address the cumulative environmental effects of development?

Long-range land use plans (area plans)

Portland does not have an explicit process for addressing cumulative environmental impacts as part of City long-range land use planning efforts. In infrastructure planning (e.g., water, sewer, roads) the City assesses current system capacity and uses models to estimate increases in future demand or loads on these systems. With this information the City determines if there are deficiencies and can design system improvements that are adequate to serve future growth.

It is more difficult to characterize the potential cumulative impacts of existing and future development on ecological systems and functions. The City does not have models to project the impacts of development on streams, wetlands, trees and vegetation, air temperature and humidity, fish and wildlife habitat connectivity and fragmentation, and impacts on fish and wildlife species at risk. In addition, the City hasn't yet established watershed-based targets or "levels of service" to help guide our planning efforts. It is also challenging to model the impacts of future development on stormwater systems, particularly in areas without a robust pipe network.

Although City long-range land use plans have not historically quantified the impacts of urban growth and development on natural resources and resource functions, the City has certainly addressed environmental impacts qualitatively in its land use planning efforts. For example, during development of the Southwest Community Plan (adopted in 2000), the City responded to community stakeholders that the cumulative impacts of development were already exacerbating stream and slope erosion, and increasing the incidence of landslides and flooding. There was community concern that if housing densities allowed under the Comprehensive Plan were realized, that the risks and impacts would continue to increase. So the City decided to revise the Comprehensive Plan designations to reduce allowed densities in identified natural resource areas.

Similarly, during development of the Linnton Hillside Plan (adopted in 2006), the City did not increase the residential density allowed under the Comprehensive Plan due to potential environmental impacts, natural hazard risks and infrastructure constraints. The City also did not allow for conversion of industrial uses in the village to mixed use due to concern about potential natural hazard related risks.

Despite City efforts to limit the adverse impacts of development in areas like the Southwest Hills and Linnton Hillside, these and other areas such as the East Buttes continue to experience adverse impacts and risks from combined natural resource, natural hazard, and stormwater infrastructure related constraints. In such areas the cumulative impacts of existing and potential future development may create unacceptable impacts and risks in the future.

Environmental Overlay Zones and Other City Regulations

The City has established land use and other regulations to prevent, reduce, or mitigate the environmental impacts of development. The City has also established non-regulatory programs to help reverse these impacts and enhance watershed conditions.

The City's primary land use planning tool for addressing the environmental impacts of development has been the establishment Environmental Overlay Zones. The Environmental Overlay Zone is a powerful tool to help reduce the impacts of development on natural resources, but it has some limitations in terms of addressing the cumulative impacts of growth and development.

The purpose of the environmental zones is to prevent detrimental impacts on natural resource values and functions, and to ensure that unavoidable significant impacts are mitigated. Environmental zone maps and zoning code regulations are established through long range land use planning projects. First the City inventories the existing natural resources in the given planning area, then analyzes the economic, social, environmental, and energy-related (ESEE) tradeoffs associated with protecting the natural resources or allowing development to occur in natural resource areas. The ESEE analysis is qualitative and does not involve quantifying the existing and projected future impacts of planned development on natural resources and their functions.

Like other City zoning, stormwater, erosion control, and floodplain regulations, the environmental overlay zone regulations are typically triggered by development proposals and are applied on a site-by-site basis. There are two tiers of Environmental Overlay Zones which reflect the City's intent to protect significant natural resources while also supporting City goals for development. The Environmental Protection Zone strictly limits development in what are generally the most sensitive and high value natural resource areas. The Environmental Conservation Zone is applied to lesser quality (but still significant) natural resource areas, allowing development that meets specific development standards or approval criteria that are applied through a discretionary land use review.

The Environmental Overlay Zone development standards include disturbance area limits, stream and wetland setbacks, and tree removal standards. These standards limit impacts on natural resources but do allow some encroachment into natural resource areas without mitigation. Development proposals that do not meet the development standards must meet a set of approval criteria that are applied through a discretionary land use review process called "environmental review". Environmental reviews require applicants to submit an "impact evaluation" which includes an identification of the natural resources and functional values on the site, and an evaluation of alternative locations, design modifications, or alternative methods of development to determine which options have the least detrimental impacts on the natural resources and functions. The current Zoning Code states: "To the extent that the site resources and functional values are part of a larger system, such as a watershed, ***the evaluation must also consider the cumulative impacts on that system."*** **(bold/italics added)**

Despite this existing code language, in practice the impact evaluation typically focuses on site-specific project-related impacts. This is in part because the City has not developed a protocol for considering how the impacts of a single project cumulatively affect larger ecological systems, taking into account current conditions, past development, current development proposals in the area, or anticipated future development. (In contrast, during Conditional Use reviews the City must evaluate the cumulative impacts of existing and proposed non-residential uses in residential areas on traffic, noise and other factors affecting livability.)

Through environmental review, the City also requires mitigation of unavoidable impacts on natural resources values and functions. Depending on the level of site disturbance associated with existing or new development, it may not always be possible to fully mitigate the impacts on-site. The Environmental Overlay Zone regulations allow off-site mitigation within the same watershed as long as the property owner owns the other site or has acquired a legal instrument to manage the other site. Because it is challenging to acquire such instruments off-site mitigation is rarely required through environmental review.

As mentioned above, the City also administers other non-land use regulations that are instrumental in prevent, reducing, or offsetting the impacts of development on watershed health. For example, all new development must meet City stormwater management and erosion control rules, which are intended to control the flow of runoff into streams and stormwater pipes, ensure that runoff is adequately clean before entering streams and rivers, and prevent eroded soil from leaving construction sites or any City property.

The City also administers floodplain regulations through the Building Code to prevent flood damage to property and help maintain floodplain storage capacity. However, these rules have some limitations. They cannot reduce the impacts of existing development and they also do not fully eliminate additional incremental effects of development. For example, there can still be additional stormwater runoff into streams, from system overflows and where stormwater systems and infiltration are limited. In addition, some parts of the remaining active floodplain in the city are exempt from balanced cut and fill requirements.

Emerging Approaches, Tools, and Targets

Recent City planning efforts have addressed cumulative environmental impacts by more explicitly applying new approaches and tools to evaluate and mitigate the impacts. For example, the City has developed an updated natural resource inventory with readily accessible GIS information on natural resources and the functions they provide. The Airport Futures project used this new inventory protocol to update information on natural resources, and required substantial off-site mitigation for the potential future loss of important grassland habitat through an intergovernmental agreement with the Port of Portland. The plan recognized that these types of habitats have been largely lost to development in the city and region, and that the cumulative effect of losing additional grassland habitat would have detrimental impacts on grassland associated species. Similarly, the City's planning efforts for a potential marine terminal on West Hayden Island have included evaluation and proposed on-site and off-site mitigation for the potential loss of ecosystem services associated with impacts on wetlands and increasingly rare bottomland hardwood forests in and along the Columbia River.

If the City wishes to more systematically address the cumulative environmental impacts of development in land use planning we will need appropriate tools and information. We will need to identify which impacts to evaluate, and at which geographic scale and timeframes. We will also need methods and tools (e.g., models) to quantify impacts and set targets, limits, or levels of service against which to measure impacts and make policy decisions.

The Bureau of Environmental Services (BES) actively monitors watershed conditions which will provide important information on baseline conditions and trends. BES is also currently developing a Watershed Health Index, a scientifically based tool for assessing and clearly communicating the condition of the city's watersheds, and for demonstrating positive or negative trends in conditions over time. The Watershed Health Index also establishes targets that define quantitatively properly functioning conditions for given indicators. The draft Watershed Health Index is currently is under review. When finalized this tool could help the City assess the cumulative environmental impacts of future growth and development and develop policies, regulations, and programmatic strategies to address those impacts over time.

In addition, the City's Urban Forest Management Plan establishes tree canopy targets that are now being used to inform our land use planning efforts. The City is addressing potential impacts on and opportunities to improve tree canopy through the Comprehensive Plan Update and Central City 2035 planning project. It should be noted however that the current tree canopy targets were not designed to meet goals for environmental quality, provide a certain level of service or system capacity (e.g., stormwater management, carbon sequestration, slope stability). Rather the targets are based on nationally-accepted estimates of achievable canopy for different land use categories. Further, the tree canopy targets are coarse and are not necessarily applicable to specific areas or sites. For example the residential private property tree canopy target of 35 – 40 percent may not be feasible to achieve in high density multi-family residential area. The Portland Plan calls for revisiting the tree canopy targets in the next 5 years so it may be possible to better link the tree canopy targets to watershed health targets in the future.

Questions for the Watershed Health/Environment Policy Expert Group (PEG)

1. Should the City be doing more to address cumulative environmental impacts in long-range planning and/or review of proposed developments?

2. What are the PEG's views on the options presented below? What are the respective pros and cons?

3. Should the City revisit and potentially modify existing Comprehensive Plan designations or zoning to reduce allowed density in areas with significant existing ecological or stormwater system constraints or deficiencies?

4. How could adopting new cumulative impact-related policies or reducing allowed densities in certain areas affect Environmental Justice communities and other vulnerable communities?

5. What are some priority follow up actions (e.g. research and analysis, coordination with other agencies organizations, concept development/testing)?

Options for Watershed Health/Environment PEG Consideration

The following section outlines some potential Comprehensive Plan policy options that would update how the City addresses the cumulative impacts of development. Following are potential implementation options that could take place once the Comprehensive Plan Update is completed.

Success Criteria

Given the complexity of dealing with cumulative impacts, and to avoid unintended consequences, several criteria should be kept in mind as the PEG considers these options. For example, the policies and implementing actions should:

1. Help the city better understand the cumulative impacts of existing and potential future development, and support the development of tools to address these impacts.

2. Enrich and improve the quality of City land use plans.

3. Be fair and equitable.

4. Be aspirational, achievable, and practical.

5. Support sustainable development design but not preclude the approval of allowed land uses or create property "takings".

6. Avoid unduly increasing the complexity, uncertainty, time and costs of land use reviews.

7. Recognize that the City must meet "nexus" and "proportionality" requirements when evaluating and imposing requirements on development projects (e.g., the City may not require mitigation for impacts from previous or future projects).

8. Recognize that the City does not have the authority to regulate some impact causes of impact (e.g., vehicle or industry air emissions, use of pesticides, etc).

Comprehensive Plan Update Options

The following options are presented for the PEG to consider and discuss.

1. Definitions

The City should add a definition of "cumulative impacts" if the term is used in the goals or policies. The definition would clarify what the term means in the context of the Comprehensive Plan policies and their potential applications. The definition should also be crafted to establish reasonable expectations for what is practicable in terms of ability to consider cumulative impacts.

"*Cumulative impact" is the impact on the natural resource functions, ecological systems, and ecosystem services, resulting from the incremental impact of disturbance or development, taking into account both existing conditions and the impacts associated with other current or reasonably foreseeable future disturbance or development in the natural resource inventory site, watershed or other applicable geographic scale(s). Cumulative impact may be positive or negative, and may be considered both qualitatively and quantitatively. The scope and practicability of considering cumulative impacts will depend on the availability of information on existing conditions and tools to estimate the incremental impacts of proposed or future disturbance or development."*

2. Policy Statements

a. The September 7, 2012 draft of the Watershed and Environmental Health policies included a number of statements in the "Land Water and Wildlife" section that focus on protecting and restoring ecological functions and ecosystem services. However the draft did not include a policy specifically calling for consideration of cumulative impacts.

The City could add a new Comprehensive Plan policy to elevate the importance addressing cumulative environmental impacts, such as:

> *"Consider the cumulative impacts of development on natural resource functions and watershed health to the extent practicable, striving to reduce detrimental impacts and support positive, beneficial impacts."*

This type of policy could provide a basis for addressing cumulative impacts through a number of implementation activities such as:

- Comprehensive Plan map updates
- Long-range plans (e.g., plan districts, natural resource protection plans)
- Zoning Code updates (citywide) e.g., base zone, procedures, overlay zones, procedures, standards and approval criteria for specified land use reviews
- Land Use Reviews, e.g., zone map updates, conditional use/master plan reviews, comprehensive natural resource plans, environmental reviews
- Natural Resource Inventory updates

Additional discussion and evaluation would be needed to determine which implementation activities provide the best avenues for addressing cumulative impacts. It can be helpful in terms of working with property owners to have as much certainty in the code as possible, rather than adding analysis requirements to discretionary land use reviews, especially for small projects. The phrase "to the extent practicable" is included at the end of the policy statement in recognition that the City will need to develop reasonable, practical tools and approaches for addressing cumulative impacts.

Alternatively the City could rely on the general watershed health/environment policies rather than adding a policy that explicitly addresses cumulative impacts. One could make a case that the general policies to protect and restore natural resource functions and watershed health cannot be

met without addressing cumulative impacts, and therefore an explicit policy is not needed. However that said, having an explicit policy about cumulative impacts elevates the issue.

b. The City could also add a Comprehensive Plan policy that elevates the importance of considering current watershed monitoring information in our land use and infrastructure planning efforts, as follows:

> *"Consider the best available information on watershed conditions and trends in land use and infrastructure planning, and to inform consideration of the cumulative impacts of development."*

c. The September 7, 2012 draft "Design With Nature" policies were discussed the PEG's September 27, 2012 meeting. The latest versions of these draft policies are presented in Attachment B as they could contribute substantially toward reducing, and in redeveloping areas reversing, the cumulative environmental impacts of existing and future development. These policies would not only encourage "green" development and infrastructure, but they would also establish the City's intent to reduce impervious area and require full mitigation of unavoidable impacts on natural resources. (Note that the commentary states the full mitigation means all functions and values lost or degraded are compensated for on-site or off-site.)

d. Based in part on previous comments from the Watershed Health and Environment PEG the City could consider adopting a policy the from Statewide Land Use Planning Goal 9, Economic Development. Specifically Goal 9 states that the carrying capacity of air, water, and land resources should not be exceed, presumably because doing so would detrimentally affect local and regional economies. Establishing a similar policy would bolster efforts to address cumulative impacts of development, but would also require that the City determine what is meant by carrying capacity in this context.

3. Consider Modifying Current Comprehensive Plan Designations or Zoning

As part of the Comprehensive Plan Update the City could reconsider and potentially revise existing Comprehensive Plan Designations where existing stormwater infrastructure capacity is constrained, environmental and property related impacts are already occurring (e.g., erosion, flooding) and it may not be feasible to upgrade system capacity to meet the needs of future growth. These conditions currently exist in portions of the West Hills and East Buttes.

Attachment A – Examples from Neighboring States

Several states, including California and Washington have established NEPA-like laws requiring "lead agencies" to conduct environmental impact analyses, including assessment of cumulative environmental impacts when producing local land use plans and conducting certain project reviews. Typically cumulative impacts are analyzed as part of a larger environmental impact assessment when creating long-range plans or in evaluating individual project proposals. For individual project proposals the environmental impact assessment is used to determine the preferred project alternative and determine appropriate mitigation.

This attachment includes 3 examples of how local jurisdictions in the neighboring states of Washington and California are addressing cumulative impacts.

The first example from City of Mukilteo, Washington provides a brief overview of how municipalities are expected to address cumulative impacts in their long ranges plans to address state shoreline guidelines.

The second example is illustrates how cumulative impacts could be evaluated for an individual project, in this case a master plan for a campus facility in Stanislaus County California

The third example is a short report on how Santa Clara County CA proposes to control the cumulative impacts of impervious surfaces.

NOTE: These examples may not be fully applicable to situations in Oregon as they are from states with different land use laws and NEPA-like laws requiring environmental analysis. Still they provide opportunities to think more broadly about the types of questions the City could be asking or addressing in our land use planning, development review, and resource management related policies and programs.

City of Mukilteo, Washington

From the City of Mukilteo's Shoreline Master Plan 3, *Cumulative Impacts Analysis Draft – February 2011:*

> According to the shoreline guidelines, WAC 173-26-186(8)(d), the City is required to consider cumulative impacts of reasonably foreseeable future development on the shorelines of the state as follows: "To ensure no net loss of ecological functions and protection of other shoreline functions and/or uses, master programs shall contain policies, programs, and regulations that address adverse cumulative impacts and fairly allocate the burden of addressing cumulative impacts among development opportunities. Evaluation of such cumulative impacts should consider: (i) current circumstances affecting the shorelines and relevant natural processes; (ii) reasonably foreseeable future development and use of the shoreline; and (iii) beneficial effects of any established regulatory programs under other local, state, and federal laws."

The City of Mukilteo's plan points out that the state guidelines recommend addressing cumulative impacts at the planning stage rather than on a project by project basis where possible, but also recognize that it may also be necessary to address the impacts of individual projects:

> **Planning Versus Project Level Assessments**
> According to the guidelines, the assessment of cumulative impacts occurs at both the planning stage (when the master program is being developed) and at the site development stage. The guidelines suggest that impacts of commonly occurring and planned development be assessed at the planning stage "without reliance on an individualized cumulative impacts analysis." In contrast, developments that have unanticipatable or uncommon impacts, which cannot be reasonably identified at the time of SMP development should be evaluated via the permitting processes to ensure that all impacts are addressed and that there is no overall loss of ecological function after mitigation [WAC 173-26-201(3)(d)(iii)]. Therefore, this chapter provides a planning level assessment of the potential cumulative impacts that would result from use and development within the shoreline jurisdiction out into the foreseeable future.

Chapter 9 Cumulative Impacts

9.1 Introduction

The CEQA Guidelines (Section 15355) define a cumulative impact as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." The Guidelines [Section 15130(a)(1)] further state that "an EIR should not discuss impacts which do not result in part from the project."

Section 15130(a) of the CEQA Guidelines provides that "[A]n EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable..." Cumulatively considerable, as defined in Section 15065(a)(3), "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."

An adequate discussion of significant cumulative impacts requires either (1) "a list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or (2) "a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area-wide conditions contributing to the cumulative impact." This cumulative impact analysis evaluates impacts based on a list of past, present, and probable foreseeable projects.

As depicted in Table 3.11.1 (Section 3.11-Population & Housing), Turlock is forecasted to grow in population by 44,289 people between 2008 and 2030 while the Campus is forecasted to buildout by 2027 at its maximum capacity of 12,000 FTE; approximately 5,300 full-time students. During the same period of time, the County of Stanislaus is forecasted to add approximately 332,000 new residents.

Table 9.1
City of Turlock Projects
In the North West City Quadrant

Brief Description	Location
Avalon Townhomes-28 Condominiums	780 W. Monte Vista Ave.
College Park-58 SF Residential Units	2007& 2129 W. Tuolumne Rd.
Park Villas-140 Condominiums	4180 N. Golden State Blvd.
Sierra Oaks Aparmtments-211Units	3025 W. Christofferson Parkway
Turlock Village-133 Condominiums	900 W. Monte Vista Avenue/University Way
Victoria Estates-16 SF Residential Units	3436 & 3536 N. Golden St6ate Blvd.

Source: City of Turlock Web Site 7-7-08

The City of Turlock has experienced extensive growth in the northwest portion of the City over the years. The NW Quadrant of the City, the area where the Campus is located, was mostly farmland when the Campus site was first located. In recent years, there has been major commercial development in the area along with significant residential growth. Table 9.1 contains a list of current approved projects that are either under construction or able to proceed to construction. A total of 453 residential units, in the immediate vicinity of the CSU Stanislaus Campus. This is typical of the growth trends in the vicinity of the Campus.

In addition to development proposed or under construction in the immediate vicinity of the Campus, there are several large projects of regional significance either approved and under construction or undergoing development review. The development of the UC Merced campus will add a major educational resource to the region and at present there are plans to develop a medical school at the new Campus near the City of Merced.

Another major project, that is in the approval stage, is the Crows Landing Business Park. This project is east of the City of Turlock but could have a major impact on the regional economy.

The CEQA Guidelines recognize that cumulative impacts may require mitigation – such as new rules and regulations, that go beyond project-by-project measures. An EIR may also 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 share of a mitigation measure or measures designed to alleviate the cumulative impact. The Lead Agency must identify facts and analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable [CEQA Guidelines, Section 15130(a)(3)].

When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. A lead agency shall identify facts and analysis supporting the lead agency's conclusion that the cumulative impact is less than significant.

The discussion of cumulative impacts is to reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

9.2 Geographic Scope

With respect to cumulative impacts, the geographic scope of potential cumulative impacts is somewhat defined by the type of impact being analyzed. With respect to Air Quality, the Geographic scope is the entire San Joaquin Valley Air Basin. The scope of Traffic

and Circulation impacts are typically limited to commute shed of a facility such as a CSU Campus.

The scope of impacts for other types of environmental concern areas, such as aesthetics, biological resources, nose, etc., tend to be more local; typically involving the campus itself and the immediate surrounding area. It should be noted, however, that some aspects of environmental effects may reach beyond the immediate setting. Wildlife impacts can have a broader regional implication but this type of regional impact is typically highly regulated (U. S. Fish and Wildlife Service and the California Department of Fish and Game) and therefore tend to be less of an environmental concern.

9.3 Area-Wide and Regional Conditions

Physical Description

The San Joaquin Valley is long (300 miles) and relatively narrow (100 miles), and occupies an area between two of the largest metropolitan areas in California and the United States. The San Joaquin Valley contains the main transportation facilities linking the San Francisco Bay Area to the north and the Los Angeles/San Bernadino metropolitan area in the south. These facilities include major highways, (Interstate 5 and State Route 99), the Southern Pacific and Santa Fe Railroads and numerous oil and natural gas pipelines, telecommunications facilities, airports and even a deep water port in the City of Stockton.

The east to west transportation facilities are less numerous, but are critical to the inter-regional transportation network of the West Coast and the western United States. Numerous highways and rail lines cross the valley in an east-west manner, including State Routes 132, 59 and 140 which connect the major north-south transportation corridors along Inter-State 5 and State Highway 99.

Growth-Inducing Impacts

The CEQA Guidelines [Section 15126.2(d)] require a discussion of "… *ways in which the proposed project could foster economic or population growth … in the surrounding environment,"* including the project's potential to remove obstacles to population growth. For example, the extension of infrastructure may encourage or facilitate other activities that could significantly affect the environment.

In compliance with the State Legislative mandate expressed in the State master Plan for Education, the CSU system is obligated to continue to accommodate all fully eligible graduates from California high schools and community college transfer students. To do so, CSU Stanislaus campus must provide for the 12,000 FTE student enrollment in response to growing demand for higher education projected for the State of California. The updated Master Plan is designed to accommodate additional students generated by State-wide growth, and thus by itself will not induce population growth in the region. As such, the updated Campus Master Plan will not foster economic or population growth beyond the growth already anticipated in the region. The Master Plan will result in infill development at an existing developed University campus within an urbanized area that is well served by existing infrastructure, and extensive new infrastructure will not be

required. The project includes all necessary improvements to the existing infrastructure to serve CSU Stanislaus campus, and no excess capacity that could induce growth will be provided.

9.4 Summary of Expected Cumulative Effects

Within Chapter 3, the cumulative impacts of individual aspects of environmental consequences of the project are discussed. A summary of these discussions is contained in Chapter 2 (Summary). For purposes of analysis, there are no "significant" adverse environmental impacts expected to result because of the implementation of this project. There are, however, five areas of "potential significant" impacts whose impacts can be mitigated to a level below the threshold of significance but are impacts all the same. These areas are, Aesthetics, Air Quality, Biological Resources, Noise and Transportation & Traffic.

Traffic, Circulation, and Parking

The traffic analysis in this PEIR (see Section 3.14) addresses both project-specific and cumulative traffic and circulation impacts that account for background traffic associated with long-term regional growth and addition of traffic generated by related projects. During the near term, no potentially significant impacts are identified. At buildout, the project's contribution to traffic will result in an impact at several intersections but the forecasted impact directly attributable to Campus growth is very small. (See Tables 3.14. 3 and 4). With implementation of the identified mitigation measures, project impacts are expected to be reduced to a less than significant level. The project's contribution to future traffic volumes will not be significant.

At the time when the University enrollment reaches 12,000 FTE students, the campus traffic together with traffic generated by the related projects will significantly impact regional roadways or Highway 99 freeway interchanges.

As discussed in Section 3.14, of this report, the CSU Stanislaus Physical Master Plan update provides for adequate on-campus parking for all campus activities, as well as the gradually growing student enrollment. Provisions of these facilities will work to preclude significant cumulative parking impact off-campus. No significant impact will result from parking.

Air Quality

The implementation of the Campus Master Plan together with related projects and future growth within the region will result in additional vehicle trips and the resultant air pollutant emissions within the Central Valley Air Basin. Operational emissions, primarily from vehicular trips associated with growth in student enrollment will contribute to the overall Valley Air Quality concerns. When the project's emissions are combined with the emissions generated by related projects and future Basin-wide growth, this will result in a cumulatively significant impact unless mitigated. Mitigation of this issue must be implemented on a global scale. National, state and local regulatory programs are being implemented in California. The recent passage of SB 375, combined with the Central

Valley Blueprint program is an example of the type of program necessary to address this issue.

In 2006, the Legislature passed AB 32—The Global Warming Solutions Act of 2006,—which requires the State of California to reduce GhG emissions to 1990 levels no later than 2020. According to the California Air Resources Board (CARB), in 1990 greenhouse gas emissions from automobiles and light trucks were 108 million metric tons, but by 2004 these emissions had increased to 135 million metric tons. SB 375 asserts that "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32.

At the region-wide level, implementation of local and regional growth management policies, a reasonable jobs/housing balance, new technologies (e.g., in vehicle emission control equipment and fuel), and programs to encourage alternative modes of transportation, including public transit, will reduce cumulative impacts and work toward attaining long-term emissions reductions. At present, the Central Valley Blue Print Project is proposing standards that emphasize "Smart Growth" policies which is expected to result in Valley-Wide policies that reduce automotive use in the Central Valley Air Basin. This program will be reinforced with the passage of SB 375.

Noise

Noise generated by campus-related traffic together with traffic noise from the related projects is analyzed in Section 3.10, Noise, of this PEIR. As indicated, with the enrollment of 12,000 FTE students, the CSU Stanislaus Physical Master Plan update will contribute to overall noise impacts but the contribution will be negligible. Since this contribution is small, the project's cumulative traffic noise impact will be less than significant.

On-site noise will be typical for university campuses in urban areas. Noise levels are not expected to change substantially as a result of the project, and future noise levels with the project will be consistent with relevant noise standards. The related projects are typical of urban uses, and are not expected to result in high noise levels, that when combined with University noise would be clearly noticeable. Cumulative noise impact will be less than significant.

Aesthetics, Light, and Glare

The Master Plan will result in infill replacement and new facilities within the interior of the CSU Stanislaus campus, including new buildings and lighting. All on-campus facility projects will be reviewed for compliance with the CSU Stanislaus Physical Master Plan design guidelines to ensure compatibility with the existing campus environment. The Master Plan works to focus new facilities within the campus interior and minimize facility growth along the campus' perimeter. New lighting will comply with existing requirements including shielding and focusing away from the surrounding uses, and other requirements and regulations (including height, setback, landscaping, etc.) that ensure appropriate and compatible lighting and design within the existing urban environment. The campus, and the surrounding City of Turlock area, is mostly urbanized. The project does not represent a new substantial new source of lighting, or structures, that would be

introduced into an undeveloped or open space area that are currently unlighted. Cumulative aesthetic, light, and glare impacts will be less than significant.

Biological Resources and Short-term Construction Impacts

Construction activities associated with the Master Plan will result in potentially significant, albeit short-term and intermittent, impacts on biological resources on the Campus. Compliance with Federal and State laws, guidance, policies and standards will reduce the impacts to a level found to be less than significant.

9.6 Future Use of This Analysis

No further cumulative impacts analysis is required when a project is consistent with the designs and standards of the CSU Stanislaus Physical Master Plan update.

Controlling Cumulative Impacts from Impervious Surfaces:

ANALYSIS AND RECOMMENDATIONS FOR SANTA CLARA COUNTY

COMMITTEE FOR
GREEN FOOTHILLS
www.GreenFoothills.org

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.

Committee for Green Foothills gratefully acknowledges the **Santa Clara Valley Water District**, whose financial support made this report possible.

Committee for Green Foothills will periodically revise this document in response to comments and future developments. The contact person for revisions is Brian Schmidt, (650) 968-7243, Brian@GreenFoothills.org.

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

Contents

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]

---

[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.

---

[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:

---

[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.

---

[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

---

[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

---

[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.

---

[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.

---

[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)

ATTACHMENT B – DRAFT "DESIGN WITH NATURE" POLICIES

POLICIES—Design with Nature

Policy 4.4. Strive to integrate low-impact development, habitat-friendly development, bird-friendly building design, and green infrastructure principles and techniques into land use, transportation, and parks natural area plans, and the design and maintenance of infrastructure facilities and development.

Policy 4.5. Prevent or limit further impacts from development and infrastructure on natural hydrology especially in areas with poorly infiltrating soils and limited public stormwater discharge points.

Policy 4.6. Require that negative impacts from development on natural resources, ecological functions and ecosystem services, and fish and wildlife be avoided when practicable, and require that impacts that can not be avoided be minimized and then fully mitigated.

Policy 4.7. Encourage innovative approaches to mitigation and natural resource enhancement.

Policy 4.8. Require monitoring of mitigation efforts and apply adaptive management to improve effectiveness.

Policy 4.9. Reduce and offset the impacts of impervious surfaces where practicable.

Policy 4.10. Strive to align stormwater system capacity with planned density and impervious surface.

Policy 4.11. Prioritize the intensification and efficient use of already developed land and return contaminated and other disturbed areas to productive use before consideration of encroachment on natural resources, where practicable.

Policy 4.12. Consider the specific conditions of each watershed in conjunction with planning and natural resource management activities.

Policy 4.13. Encourage development and infrastructure designs that provide safe wildlife crossings and movement corridors and remove barriers to fish and wildlife passage.

Policy 4.14. Encourage development and infrastructure designs that avoid or reduce the impacts of urbanization on environmental justice communities and other vulnerable populations.

Policy 4.15. Encourage the incorporation of native trees and other vegetation in development and infrastructure designs.

Policy 4.16. Encourage the incorporation of habitat for birds, amphibians, reptiles, small mammals, and pollinators and other insects into landscaping and sustainable stormwater facilities, and other features of the build environment.

Policy 4.17. Encourage development and infrastructure designs that protect public health and safety, and avoid the costs associated with degraded natural resources and reduced ecosystem services.

Policy 4.18. Encourage property owners and other agencies to restore habitat on their property.