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TECHNICAL MEMO

Project No: 133904

San Diego Hydromodification Management Plan

Subject: Responses to Comments Provided by San Diego Coastkeeper

Date: February 16, 2010

To: Sara Agahi, P.E. – County of San Diego

From: Eric Mosolgo, P.E. – Brown and Caldwell

This draft technical memorandum has been prepared per the request of the County of San Diego to summarize responses to comments made in reference to the San Diego Hydromodification Management Plan (HMP) by San Diego Coastkeeper. These comments were submitted to the County of San Diego in letters dated April 14th, September 29th, and November 30th, 2009.

As mandated by Regional Water Quality Control Board (RWQCB) Order R9-2007-0001 Provision D.1.g, the purpose of hydromodification criteria is to prevent development-related changes in storm water runoff from causing, or further accelerating, stream channel erosion or other adverse impacts to beneficial stream uses.

The responses detailed in this memo have been incorporated into the Final HMP submitted to the San Diego Regional Water Quality Control Board (RWQCB) on December 29, 2009.

Responses to Coastkeeper Comments Dated November 30, 2009

Coastkeeper Comment – The inadequacies in applying LID are the HMP's most serious faults. They start with regarding LID as almost entirely a matter of infiltrating runoff, diminishing or ignoring the mechanisms of evapotranspiration and water harvesting and the practices associated with those mechanisms. Furthermore, the plan recommends basing infiltration assessments on coarse U.S. Department of Agriculture concepts and data instead of site-specific analysis and almost totally ignores the great potential of organic soil amendments to improve infiltration and evapotranspiration and reduce surface runoff quantities. The HMP reveals a poor appreciation of the status, performance, and practice of LID techniques today.

Response

- LID options modeled in determination of sizing factors account for both infiltration and evapotranspiration. Continuous simulation models are currently in development to determine the sizing factors for a wide range of development types, rainfall gauges, soil types, and BMP mitigation options. The evapotranspiration (ET) data is a key component of the continuous simulation models, along with the infiltration capacity of the soil, and is more certainly not an ignored mechanism. That said, BMPs studied in this analysis have to meet the County of San Diego's vector control guidelines along with the 85th percentile water quality and hydromodification standards. Thus, storage of runoff in excess of 72 hours will not be allowed.

- While water harvesting and reuse have obvious benefits, these criteria are not addressed or mandated in the Permit. From a hydromodification standpoint, water reuse facilities have some benefit for isolated rainfall events. When back-to-back storms occur, however, the hydromodification benefit is often not sufficient since the storage facilities are filled and provide no attenuation for the multiple concurrent storms. The use of rain water storage as a hydromodification control measure has not been ruled out. Rather, Copermittees can consider developer proposed storage facilities on a case by case basis. Such design strategies must prove compliance with hydromodification design criteria considering the long-term historical rainfall record.

- The Decision Matrix, located in Chapter 6 of the Final HMP, specifically states that site-specific geotechnical investigations be conducted to determine site-specific infiltration rates. Copermittees already require major development projects and many smaller projects to submit geotechnical soils reports which typically include identification of soil types. The referenced USDA information is part of the required Literature Review, which is located in Chapter 4 of the Final HMP. Infiltration parameters for the San Diego Region will be reviewed in details as part of the Sizing Calculator development process and further refined as part of the HMP implementation process.

- The use of amended soils has always been part of the HMP mitigation approach and the text of the Final HMP explicitly encourages the use of amended soils in the design of bioretention facilities. This concept is chronicled in both the HMP and the Model SUSMP. Similar to the approach used in Contra Costa County, several of the proposed BMP facilities will use an amended soil layer with an approximate infiltration rate of 5 inches per hour. Criteria provided in the Model SUSMP and HMP will work in concert. It should be noted that the use of amended soils will not promote deep infiltration for Types C and D soils, which are the dominant soil types in San Diego County. Thus, the use of underdrains may be required in urban environments.

- The Copermittees and the consultant team have developed detailed standards for LID implementation. These standards are provided in the Model SUSMP and are referenced in the Final HMP. The Final HMP recommends the use of LID facilities to satisfy HMP and 85th percentile water quality criteria.

- The intent of the HMP, as well as the Model SUSMP, is to encourage the use of LID facilities to meet hydromodification criteria. The text of Chapters 6 and 7 of the Final HMP were reviewed in detail and revised accordingly to encourage implementation of LID facilities.

- Defining the infiltration potential of a site is recommended to provide for sound engineering design. Even if infiltration is shown to be infeasible, LID facilities can be designed as filtration-type or evaporation-type facilities instead of infiltration-based facilities.
- Chapter 7 of the Final HMP has been revised to allow for evaporation-type facilities. It should be noted that such facilities may require implementation in series with more traditional LID approaches, such as biofiltration basins, in order to satisfy vector control and hydromodification criteria.

Coastkeeper Comment- Concerning the critical flow rate, the HMP presents an alternative to using a single value, a practice adopted elsewhere. The concept of multiple values is theoretically sound, but the plan falls short in specifying how the method it develops should be applied to assure proper use. Unless and until that gap can be filled, the appropriate single value, 10 percent of the 2-year flow event, should be used for the critical flow rate.

Response

- The San Diego HMP's varying lower flow threshold is a major advancement in the field of hydromodification management. This concept has been endorsed by the State Water Resources Control Board and other experts in the field. It is intuitive that erosion-prone streams should be held to a more stringent lower flow threshold as compared to erosion-resistant streams.
- Decision Matrices located in Chapter 6 clearly specify the method for determining the appropriate lower flow threshold. The method uses data from both the Southern California Coastal Water Research Project's (SCCWRP) channel screening tools (discussed in Chapter 5.2 and Appendix B) and the consultant team's critical flow calculator (discussed in Chapter 5.1) to determine the appropriate lower flow threshold.

Coastkeeper Comment – Exemptions put forward by the HMP fall into two categories: those that have been poorly thought through and, as presented in the plan, will continue to allow substantial hydromodification; and those that will forever consign degraded streams to that status. Both must be seriously reconsidered.

Response

- Exemptions proposed in the San Diego HMP have been thoroughly reviewed, discussed and analyzed.
- The exemption regarding projects that decrease both the pre-project impervious area and outlet discharge rates is logical. If the unmitigated post-project condition results in no increase to either impervious surface or resultant outflows as compared to pre-project conditions, then the project has no negative impact on downstream erosion .
- Exemptions regarding direct discharges to existing concrete channels have been thoroughly discussed with both the TAC and the Copermittee Work Group. This potential exemption was referenced in the Permit. A direct discharge to a concrete channel which connects to a

downstream exempt system poses an insignificant hydromodification related issue provided that the concrete channel has capacity to convey the ultimate condition 10-year flow. Note that if the downstream conveyance system passes through a stream segment susceptible to erosion, if the concrete channel does not have capacity to convey the ultimate condition 10-year flow, or if the project does not discharge directly to the existing concrete channel, then the existing concrete channel exemption may not be granted.

- Exemptions regarding direct discharges to large river systems have been analyzed using continuous simulation modeling and review of the resultant flow duration curves. This item has also been discussed in detail with the Copermittee Work Group, the TAC, and the Regional Board. This potential exemption applies only to river reaches with 100-year flows in excess of 20,000 cfs and drainage areas in excess of 100 square miles. The upstream limits of the specific potential exempt reaches, which are detailed in Table 6-1, were set based upon reach-specific review of the floodplain width, degree of upstream reservoir attenuation, etc. A detailed flow duration analysis was conducted to test the variability in flow duration curves based upon hypothetical additions of master development areas. Historical flow duration curves were based upon streamflow data in the San Diego River, as provided by USGS.

- Exemptions regarding urban infill projects in highly urbanized watersheds have been analyzed using continuous simulation modeling and review of the resultant flow duration curves. This item has also been discussed in detail with the Copermittee Work Group, the TAC, and the Regional Board. This potential exemption applies only to projects that discharge runoff directly to a stabilized conveyance system that extends beyond the Domain of Analysis. The exemption is only valid for watersheds with an existing impervious area of 40 percent or greater and with the potential for no more than a 3 percent impervious area increase in ultimate developed conditions (as compared to existing impervious area for the watershed). A detailed flow duration analysis was conducted to test the variability in flow duration curves based upon hypothetical additions of watershed impervious areas. It should be noted that the Permit allows for an exemption when the project discharges to a watershed with an existing impervious area percentage greater than 70 percent. Thus, this particular exemption is focused on highly urbanized watersheds containing an existing impervious area percentage between 40 and 70 percent.

Coastkeeper Comment – The subject of monitoring is only partially developed. At this stage it appears to be missing an in-stream component to determine if indeed the program is meeting its charge to manage channel erosion and impacts to beneficial uses and stream habitat.

Response

- As detailed in Chapter 8 of the Final HMP, in-stream monitoring is required at locations downstream of the monitored project site. Baseline cross section monitoring would be required prior to construction of the project. Subsequent cross section monitoring would then be required at defined intervals following construction of the site to assess effects of hydromodification mitigation controls.
- Chapter 8 of the Final HMP includes requirements for flow-based sediment monitoring. Results of such sediment monitoring can be used to determine the low flows which initiate sediment movement. This data can be used to further refine the low flow thresholds.
- Chapter 8 of the Final HMP also includes requirements for the monitoring of BMP inflows and outflows to assess BMP effectiveness. These protocols are similar to the monitoring requirements for the Contra Costa HMP.

Responses to Coastkeeper Comments Dated September 29, 2009

Coastkeeper Comment – The HMP is disconnected from the purpose and requirements of the MS4 permit. Following the first few meetings, we submitted an email that asked the TAC to take the opportunity to think more holistically and to stem the growing disconnect between the direction of the development of the HMP and the intent of the NPDES permit. We received assurances that the TAC and the consulting team were looking to take this opportunity to create "the most holistic HMP carried out to date in California." Unfortunately, this promise has not been kept. We understand the HMP must address erosion, but it must also address water quality issues. The Copermittee Working Group and TAC's silo approach may have devastating consequences down the line. When one regulatory effort moves forward without consideration of other ongoing efforts, implementation becomes impossible. This is especially true in light of significant movements by various Regional Boards (including San Diego Regional Board) to move toward a more holistic approach to MS4 Permit implementation.

Response

- Throughout the HMP development process, the Copermittees and the consultant team have held regular meetings with the Regional Board to discuss the approach. Through this process, the HMP direction has focused on the purpose and requirements of the MS4 permit.
- The San Diego HMP, Model SUSMP and subsequent implementation sizing tools explicitly recommend integrated facilities that provide for both water quality treatment and hydromodification flow control. The recommended implementation of Integrated Management Practices, such as LID bioretention basins, will provide for both 85th percentile water quality treatment and hydromodification flow control. Water quality issues have been addressed extensively in the Model SUSMP.

Coastkeeper Comment - The HMP inappropriately includes policy and compliance provisions. It appears the Copermittees misunderstand the role of the TAC itself. Throughout the HMP development process,

decisions have been made based not on science, but on "policy" grounds. For example, at the June HMP TAC meeting, a discussion centered on minimum orifice size for BMPs to meet HMP and flow rate requirements. The TAC recognized the conflict between the model and minimum orifice requirements predicted for fine-grained systems. In the end, the decision was labeled a "policy" choice to be made by the Copermittees. However, such decisions must be based on sound science to meet the goals of the Permit. The HMP contains other policy choices made by the TAC and Copermittee working group that are inappropriate for the technical document, and circumvent the Permit. For example, with regard to implementation of the HMP, restoration activities are listed as an alternative to compliance with flow control criteria. The Permit allows for implementation of such activities without adverse impacts to channel beneficial uses. However, the HMP proposes a cost-benefit analysis for implementation of the HMP design requirement. The Permit does not contain such "in-lieu of" language, nor can it be inferred from the Permit. Moreover, injecting such cost-benefit analysis into the Permit creates a loophole in implementation of the HMP. Such subjective analysis should not be part of the HMP in light of the mandate to "manage increases in runoff discharge rates and durations." Additionally, implementation of buffers, revegetation, etc. does not meet the twin roles of the HMP: addressing the "changes in a watershed's runoff characteristics resulting from development, together with associated morphological changes to channels receiving runoff." The in-lieu of planning measures does not address the change in watershed runoff characteristics. The HMP exemption for the lower third of the watershed is also an unsubstantiated policy decision. Impacts to all areas of a watershed need to be addressed. No support has been given for such an exemption, nor is it considered in the Permit. Runoff from impervious surfaces not only causes erosion, but also carries pollutants to receiving waters. As the Permit requires HMP implementation to prevent "significant adverse impacts to beneficial uses, attributable to changes in the discharge rates and durations," wholesale exemptions for portions of a watershed are inappropriate.

Response

- As was the case in both the Santa Clara and Contra Costa HMPs, the San Diego HMP included some policy decisions. These policy decisions, which were ultimately made by the Copermittee Workgroup considering advice provided by the TAC, were based upon scientific investigations and analysis as well as practical considerations. The Hydromodification/SUSMP Workgroup was convened periodically over the course of the project at times corresponding with key decision points in developing the HMP and the update to the Model SUSMP. This workgroup was tasked with providing regional standards and consistency in the development, implementation, assessment, and reporting of urban runoff activities and programs related to hydromodification management. As required by Permit Section D.1.g, the Workgroup assisted in the development of the regional HMP. A key element of the San Diego HMP was the creation and involvement of a Technical Advisory Committee (TAC). The TAC members consist of respected individuals from academia, technical resource agencies, the development community, consulting engineers, and environmental organizations. The TAC, which has been convened on ten occasions that correlated with key decision-making points in the development of the HMP, was tasked with providing technical input to the HMP's scientific approach and interpretation of results integral to the establishment of numerical flow control standards as well as to the Copermittees for their policy determinations.

- Regarding the minimum orifice size issue, detailed analyses were prepared using continuous simulation hydrology to assess the effects of the minimum orifice size criteria. As a result, the minimum orifice size criteria may only be used in very limited scenarios to avoid problems

resulting from clogged orifices and uncontrolled overflows. These scenarios are detailed in Chapter 6.2 of the Final HMP. The policy decisions regarding the minimum orifice size criteria were based on a detailed continuous simulation hydrologic analysis. This detailed analysis was combined with practical considerations regarding facility maintenance (specifically, the clogging of small orifices which would cause riser overflows and the potential for increased erosion downstream) to maximize HMP facility effectiveness.

- Regarding the stream restoration / rehabilitation options, this issue was fully discussed with the Regional Board, the TAC, and the Copermittee Work Group. As worded in the Final HMP, such channel rehabilitation options may be constructed in limited situations. Specifically, such options may only be constructed if the existing channel susceptibility is determined to be "High" (as determined by SCCWRP assessment), if the stream rehabilitation project extends downstream to an HMP exempt system, and if the stream rehabilitation project is constructed assuming ultimate development conditions upstream of the project. Details of the stream rehabilitation protocols are detailed in Chapter 6.3 of the Final HMP. Additionally, permits from resource agencies are necessary in most cases, and improvement to habitat and the environment are expected.
- The Final HMP contains no mention of a cost-benefit analysis regarding stream rehabilitation measures. However, developers will ultimately use cost-benefit analyses when selecting alternative methods for meeting Permit requirements.
- The final HMP contains no mention of the "lower third of the watershed" exemption.

Coastkeeper Comment – TAC consensus has been misrepresented to the Regional Board. Recently, we have become aware of the Copermittees misrepresentation of TAC consensus regarding decisions made in developing the HMP. Our continuing disagreements with the current conclusions of the draft HMP are evident from: our emailed comments submitted by Karen Franz on February 2, 2008; our comment letter from our expert Dr. Horner; submitted on April 14, 2009; and our requests for underlying technical data to support the HMP. Following the receipt of the responses to comments from Dr. Horner, we requested the supporting references and technical papers that were the basis for the development of the design storm formulation for the Santa Clara and Contra Costa HMPs. The request was made at the June 17th meeting, and no communication of the references or technical papers followed the request. Further, the draft HMP was not give to TAC members until after it was first presented to the Regional Board. A TAC meeting was held in October 2008, and another meeting was not held until February 2009. In the interim, the consultants met with the Copermittee working group, obtained approval of the draft HMP, and submitted it to the Regional Board. It was not until February 4, 2009 that TAC members were sent an electronic copy of the HMP. We obtained a physical copy of the draft HMP at the Copermittee meeting in January shortly after it was submitted to the Regional Board and before it was sent to the TAC. TAC consensus and approval are also misrepresented on key issues, such as HMP compliance through "no increase to pre-project impervious area and no increase to pre-project flow." Contrary to the document assertion, this has not been "discussed and approved by the TAC." Coastkeeper has and will continue to insist upon natural, pre-project flows and reduction in overall impervious area.

Response

- In the Final HMP, the phrase "majority TAC approval" was used to indicate the majority opinion of the cumulative TAC members.
- Technical memos detailing the preparation of the Santa Clara and Contra Costa HMPs are public information and located at the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPP) web site and the Contra Costa Clean Water Program (CCCWP) web site.
- The majority of the members of the TAC agreed that HMP requirements should not be imposed on developments that decrease the pre-project impervious cover and decrease the design flows to each outlet location.

Coastkeeper Comment – Coastkeeper's effectiveness has been stymied by a lack of transparency and unavailability of key documents. Coastkeeper concurs in the Regional Board's comments made on June 29, 2009. The lack of detail and transparency highlighted in the letter has been a particular concern for Coastkeeper as well. For instance, the BMP sizing tools and their reporting should be a transparent process. Although the tools go beyond the scope of the HMP development, they are a necessary piece of the process, and as such, the HMP should provide more oversight on their use. Additionally, Coastkeeper's specific comments from our technical expert Dr. Horner remain largely ignored or dismissed out of hand. Even to get an electronic copy of the draft HMP for our expert to review proved challenging. Several attempts were made to request the document by email, without success. We were ultimately forced to scan a paper copy we obtained from a Stormwater Copermittee meeting where the draft HMP was distributed. At a TAC meeting following submission of the comment letter, several TAC meeting attendees and members opined about the radical nature of our comments and marginalized Coastkeeper. This type of discussion is indicative of the limited role Coastkeeper was able to play in participating on the TAC. This process of excluding the TAC from critical decision-making, and information exchange has also hindered the usefulness of the TAC.

Response

- All documents prepared in association with the Final HMP are available for public review. These documents were presented on multiple occasions for review by the TAC, Copermittee Workgroup and the Regional Board. These documents are posted on the Project Clean Water web site.
- The BMP sizing tool development is a transparent and ongoing process. These are implementation tools and were not required as part of the HMP document. Key technical memos and data reviews will be circulated to the TAC, Copermittee Working Group and Regional Board throughout the Sizing Calculator development process.
- Dr. Horner's comments have been addressed in previous comments response document and in this comment response document.

Coastkeeper Comment – A lack of data inhibits progress. In addition to the lack of transparency in information exchange by consultants and Copermittees to TAC members, the delay in production of key

aspects of the HMP prohibits meaningful input from the TAC. For example, the San Diego region has three distinct geomorphic and hence geologic regions. The geologic conditions of a watershed/catchment area are the factors affecting the low flow threshold values. Other critical components that may never be reviewed by the TAC include development of maintenance and long-term monitoring protocols and the required approval process for Priority Development Projects. The incorporation of these tools into the decision matrix and preparation of consultant technical memos are critical steps in the HMP which have yet to be conducted, and may largely take place outside of the TAC.

Response

- The HMP was submitted on time to the Regional Board on December 29, 2009.
- Prior to the final submittal, multiple iterations of the HMP document and supporting memos were distributed to the TAC, Copermittee Work Group and the Regional Board.

Coastkeeper Comment – Exemptions remain ill-conceived and overused. The Draft HMP makes exemptions for hardened channels as arguably allowed by the current Permit, but these exemptions are neither required nor prudent. First, the Permit language gives some discretion to the Copermittees, not requiring exemptions and qualifying such decisions with the requirement not to impact beneficial uses. Moreover, the proposed South Orange County stormwater permit specifically requires hydromodification considerations for restoration of such hardened channels. Also, the Copermittees attempt to create an exemption for projects with "no net increase" in impervious area is also not in line with the Regional Board's interpretation of "pre-project" as highlighted in the proposed South Orange County Permit. Therefore, pre-project conditions in the current Permit should not make exceptions for "no net increase" unless such projects mimic naturally occurring conditions. Further, the "adoption and implementation of this NPDES permit relieves the Copermittee from developing a non-point source plan, for the urban category, under CZARA." CZARA requires implementation of management measures to prevent non-point source pollution from impacting or threatening coastal water quality. Therefore, exemptions for the lower portions of watersheds or large receiving waters are not allowed.

Response

- The exemption regarding projects that decrease both the pre-project impervious area and outlet discharge rates is logical. If there no increase to either impervious surface or resultant outflows as compared to pre-project conditions, then the project has no negative impact on downstream erosion.
- Exemptions regarding direct discharges to existing concrete channels have been thoroughly discussed with both the TAC and the Copermittee Work Group. This potential exemption was referenced in the Permit. A direct discharge to a concrete channel which connects to a downstream exempt system poses an insignificant hydromodification related issue provided that the concrete channel has capacity to convey the ultimate condition 10-year flow. Note that if the downstream conveyance system passes through a stream segment susceptible to erosion, if the concrete channel does not have capacity to convey the ultimate condition 10-year flow, or if the project does not discharge directly to the existing concrete channel, then the existing concrete channel exemption may not be granted.

- Exemptions regarding direct discharges to large river systems have been analyzed using continuous simulation modeling and review of the resultant flow duration curves. This item has also been discussed in detail with the Copermittee Work Group, the TAC, and the Regional Board. This potential exemption applies only to river reaches with 100-year flows in excess of 20,000 cfs and drainage areas in excess of 100 square miles. The upstream limits of the specific potential exempt reaches, which are detailed in Table 6-1, were set based upon reach-specific review of the floodplain width, degree of upstream reservoir attenuation, etc. A detailed flow duration analysis was conducted to test the variability in flow duration curves based upon hypothetical additions of master development areas. Historical flow duration curves were based upon streamflow data in the San Diego River, as provided by USGS.

- Exemptions regarding urban infill projects in highly urbanized watersheds have been analyzed using continuous simulation modeling and review of the resultant flow duration curves. This item has also been discussed in detail with the Copermittee Work Group, the TAC, and the Regional Board. This potential exemption applies only to projects that discharge runoff directly to a stabilized conveyance system that extends beyond the Domain of Analysis. The exemption is only valid for watersheds with an existing impervious area of 40 percent or greater and with the potential for no more than a 3 percent impervious area increase in ultimate developed conditions (as compared to existing impervious area for the watershed). A detailed flow duration analysis was conducted to test the variability in flow duration curves based upon hypothetical additions of watershed impervious areas. It should be noted that the Permit allows for an exemption when the project discharges to a watershed with an existing impervious area percentage greater than 70 percent. Thus, this particular exemption is focused on highly urbanized watersheds containing an existing impervious area percentage between 40 and 70 percent.

- The San Diego HMP complied with permit provision for the San Diego region, not the South Orange County permit.

Coastkeeper Comment – Selection and implementation of BMPs are vague or missing. The Draft HMP does not provide a list possible preferred BMPs, and the explanation of BMPs thus far at TAC meetings have been equally vague. At the outset we find that the BMP specific design criteria will be much more useful and transparent. It is unclear why the TAC has not chosen this route. Additionally, although the age of a BMP system has a great influence on the efficacy of that BMP, no provisions or requirements exist to address this issue. We have also asked to include infiltration and rainwater harvesting in the list of BMPs, but apparently only dry wells have been added so far. San Diego's reliance on imported water and its precipitation patterns create a tremendous regional opportunity for the development of rainwater harvesting systems to not only capture and reuse this resource, but also to reduce flow (and sediment) from Priority Development Projects. The Ventura County permit requires all features constructed to render impervious surfaces "ineffective:" to "infiltrate, store for reuse, or evapotranspire, without any runoff at least the volume of water that results from" the 85th percentile, 24-hour runoff event, annual runoff based on unit basin storage to achieve 80 percent or more volume treatment, or a 0.75 inch storm event. The San Diego HMP should contain greater emphasis on infiltration, reuse and evapotranspiration as well.

Response

- Chapter 7 of the Final HMP and the Model SUSMP include a suite of BMPs that can be used for water quality treatment and hydromodification flow control. The suite of BMPs listed, including bioretention basins, biorentention in series with cisterns, bioretention in series with vaults, extended detention basins, and flow-through planter boxes, corresponds to the BMP selection list that will be provided in the Sizing Calculator.
- While water harvesting and reuse have obvious benefits, these criteria are not addressed or mandated in the Permit. From a hydromodification standpoint, water reuse facilities have some benefit for isolated rainfall events. When back-to-back storms occur, however, the hydromodification benefit is often not sufficient since the storage facilities are filled and provide no attenuation for the multiple storms. The San Diego permit does not require rainwater harvesting for hydromodification mitigation. The use of rain water storage as a hydromodification control measure has not been ruled out. Rather, Copermittees can consider developer proposed storage facilities on a case by case basis. Such design strategies must prove compliance with hydromodification design criteria considering the long-term historical rainfall record.
- The 5 percent EIA requirement from the Ventura permit is not included in the San Diego MS4 permit.

Coastkeeper Comment – The HMP does not consider climate and land use change. Effects of climate and land use changes on low flows and other hydrologic responses have been well documented as to the hydrological effects that will result in our region. When employed singly and in combination, climate and land use changes have significant and varying effects on flow conditions. The draft HMP contemplates only one rate of land-use change. The HMP needs to consider the potential impacts of climate change and the effects that it will have on regional hydrologic conditions through its modeling. Hydrologic data is being generated by the Hydrologic Research Center, a San Diego-based international research center.

Response

- While climate change effects were not considered in this version of the HMP, it is possible that the rainfall data sets prepared in association with the HMP could be updated once predictive rainfall models have been developed. These data sets could be used to refine recommendations of future HMP updates.

Coastkeeper Comment – Implementation of a standard of 3 percent maximum allowable Effective Impervious Area (EIA) in all regulated projects, with a narrowly crafted alternative compliance provision for developments where severe site constraints, such as non-infiltrative soils, render compliance with the 3 percent EIA limitation impossible.

Response

- The Effective Impervious Area (EIA) requirement was not part of the San Diego MS4 permit.

Coastkeeper Comment – As a hydromodification standard, post-development peak flow rates and volumes shall not exceed the modeled peak flow rates and volumes of pre-European-settlement native land cover for all storms from the channel-forming event to the 100-year frequency stream flow. This requirement shall be satisfied to the maximum possible extent by retention of runoff on the development site through infiltration, evapotranspiration, and/or rainwater harvesting. If the requirement cannot be fully met by onsite retention, there shall be a demonstration and convincing justification, according to specific criteria, of why it is not achievable at that site. If such a convincing demonstration and justification can be made, the differential between the required retention and the amount that can be provided onsite shall be offset by performing or contributing to an offsite project, within the same watershed, to retain an equal or greater volume of runoff from such other site.

Response

- The hydromodification standard, as interpreted from the San Diego MS4 permit, requires the control of peak flows and durations within the geomorphically significant flow range to pre-project conditions. No mention of pre-European settlement is included in the San Diego MS4 permit.

Coastkeeper Comment – Monitoring of HMP compliance must be conducted at more than 5 sites in the entire County. At least one site per watershed must be monitored. Additionally, monitoring should begin before development, not after completion. Monitoring site selection should also be made with Regional Board staff input, not solely by Copermittees.

Response

- No HMP monitoring plan in the State of California proposes more than 5 countywide monitoring sites. The recommendations detailed in Chapter 8 exceed the requirements for Contra Costa County as approved by the San Francisco Regional Board.
- As detailed in Chapter 8 of the Final HMP, monitoring will begin before development and extend into the future following development.

Coastkeeper Comment – Individual Priority Development Projects must be required to monitor effectiveness and maintain HMP BMPs and compliance measures. A real, tangible monitoring mechanism and compliance determination must be implemented into the HMP. Without such requirements in the HMP, no assurance of long-term effectiveness will be provided. Such tools would also help Copermittees monitor specific BMP effectiveness in different watersheds.

Response

Monitoring of the 5 sites will be a regional Copermittee effort. Individual Priority Development Projects are required to inspect and maintain their treatment control and HMP facilities through maintenance agreements. Additionally, Copermittees conduct annual inspections of treatment BMPs and HMP facilities as required by the Municipal Permit.

Coastkeeper Comment – Urge the Regional staff to ensure strict compliance with the current Permit and look toward future consistency with other MS4 Permits in southern California, as setting the MEP standard.

Response

- We will defer to the Regional Board for a response to this comment.

Coastkeeper Comment – Future development, implementation, and monitoring of the HMP should be more transparent, including more availability for public input.

Response

- We will continue to provide technical memos and materials available for public review through the TAC, Copermittee Work Group and the Regional Board. These documents can be accessed at the Project Clean Water web site.

Coastkeeper Comment – High, Medium and Low susceptibility ratings should be removed. All watersheds should be treated as susceptible to erosion. Moreover, the classification of streams does not correlate to an appropriate HMP objective. For instance, for already unstable channels the standard is to "avoid acceleration of the existing erosion problems." This is unacceptable, and does not meet the spirit of intent of the Permit.

Response

- Stream classification, as provided for in this HMP by the SCCWRP channel susceptibility analysis, is a requirement of the MS4 permit (Permit Section D.1.g.(1)(a) and (m)). Therefore, this information will not be removed from the HMP. It is a critical component of the HMP for San Diego County and all counties in southern California.

Responses to Coastkeeper Comments Dated April 14, 2009

Coastkeeper Comment - Comparing the stated San Diego County criteria to hydromodification standards elsewhere, the County's criteria are relatively highly protective of runoff receiving waters in the cases of flows of 5- and 10-year frequencies. On the other hand, these criteria do not extend to the larger storms of less frequency. Some hydromodification criteria cover a range of storms up to the 50- and even 100-

year events. In the central city area of San Diego, rainfalls of 24-hour duration for different frequencies are approximately (http://ponce.sdsu.edu/noaa_24hr_sd_2x.html): 5-year—2.4, 10-year—2.8, 50-year—3.5, and 100-year—4.1 inches. Thus, it may be seen that extending the assessment from the 10- to the 100-year frequency enlarges the time period over which resource protection is evaluated by an order of magnitude (1000 percent) with an increase of just 46 percent in the rainfall quantity. The criteria should be extended to these larger storms, or the County should show why doing so is not necessary to protect and recover stream ecosystems.

Response

- Similar to the two previously approved hydromodification management plans in the State of California (Santa Clara County and Contra Costa County), the San Diego Final HMP recommends flow and duration control for a range of flows between a fraction of the 2-year flow event to the 10-year flow event. Neither the approved Santa Clara HMP nor the approved Contra Costa HMP required controls for flow recurrence events in excess of the 10-year design flow.
- The referenced 24-hour rainfall totals in the comment above refer to a single-event design storm approach, which is not applicable with the continuous simulation hydrologic modeling approach mandated in Permit R9-2007-0001. The Permit goes on to say that determination of peak flow frequency values shall be developed from analysis of the full rainfall record. In other words, hourly data from the entire rainfall record (35 to 50+ years) is used in the analysis as opposed to use of a singular rainfall depth as noted in the comment above.
- Finally, it should be noted that various geomorphologists across California and the nation have concurred that controls above the 10-year flow event have a minimal impact on cumulative sediment movement across the historical record. Sediment transport studies based on a continuous flow record, such as the long-term analysis prepared in association with the Santa Clara Hydromodification Management Plan, have shown that roughly 90 percent of the cumulative work exerted on a channel occurs within the relative flow ranges detailed in the Santa Clara, Contra Costa, and San Diego HMPs. Thus, it can be demonstrated that the significant cost associated with controls above the 10-year event would not result in significant additional protection to the stream processes from a hydromodification standpoint.

Coastkeeper Comment - Criteria setting is, "... based on the understanding that the 5-year design flow is considered the dominant channel-forming discharge for Southern California streams." If the basis is merely an "understanding", it is not strong enough. The basis must be rooted in detailed analyses. Such analyses elsewhere in the nation have identified flows having frequencies around 1.5 to 2-year to be the channel-forming discharges.

Response

- Per the Final HMP, lower flow threshold criteria were based upon a fraction of the 2-year design flow. This determination was made using a synthetic modeling approach which used the continuous rainfall record to determine hydrologic response. Sediment transport models were then simulated for the entire historical record for a wide variety of channel conditions.

- The commentary regarding the 5-year design flow in the comment above was provided in reference to determination of interim flow control standards. As a reasonable first step for the setting of the interim standards, initial determinations were made based upon previous research conducted by the Southern California Coastal Water Research Project (SCCWRP) and others. The final flow control standards are based upon detailed hydrologic and sediment transport analyses.

Coastkeeper Comment - The plan contains exemptions from requirements that will foreclose future stream restoration options, or at least substantially increase their difficulty. One such instance is allowance of planning measures as alternatives in lieu of stormwater flow controls. Another is the allowance of a demonstration that projected increases in runoff peaks and/or durations will not accelerate stream channel erosion. The plan further provides a dispensation for controls if a project applicant conducts a sediment transport analysis and shows no adverse impact. Such demonstrations could be convincingly made when a channel is hardened or already cut to bedrock, but each permitted increment of flow further reduces the opportunity to recover a natural stream, and its ecological values. The plan goes on to state specifically that hydromodification management flow controls will not be required for discharges into hardened channels or the downstream sub-watershed imperviousness is at least 70 percent and the potential for cumulative impacts is "minimal". This policy essentially consigns these channels perpetually to their artificial, highly degraded status with almost no ecological function. These exemptions should be removed, at least until a broad assessment of restoration potential can be completed and the most opportune cases prioritized for implementation.

Response

- The exemptions listed in the HMP closely follow recommendations provided in Permit R9-2007-0001, especially with regard to discharges to existing hardened channels, storm drain systems, and into existing highly urbanized watersheds (with a percent imperviousness > 70%).
- Planning measures such as implementation of Low-Impact Development (LID) facilities would still be required to demonstrate that the mitigated condition would meet mandated flow and duration control criteria.
- Planning measures such as the implementation of riparian buffers or non-hardened stream restoration/rehabilitation projects would require mitigation proof in the form of an accompanying hydraulic and/or sediment transport analysis of sufficient technical rigor. The HMP does not allow for the implementation of concrete channel solutions as a method for stream restoration/rehabilitation.

Coastkeeper Comment - The plan is silent on how the potential for cumulative impacts can or should be assessed and what "minimal" is. It should be explicit on these subjects.

Response

- Chapter 5.3 provides a discussion of cumulative watershed impacts.

- Definition of cumulative watershed impacts was quantified in the detailed continuous simulation models prepared in association with the river system exemption, highly urbanized watershed scenario, and minimum orifice size. This discussion is detailed in Appendix F.

Questions related to this comment response document should be directed to Sara Agahi at (858) 694-2665.