4.8 HYDROLOGY AND WATER QUALITY

INTRODUCTION

This section of the EIR describes relevant regulations and existing conditions and analyzes the Project's potential to result in impacts associated with hydrology and water quality, including: violation of water quality standards; degradation of water quality; construction-related stormwater runoff impacts; operational stormwater runoff impacts; and impacts on beneficial uses in receiving water bodies. A Conceptual Water Quality Management Plan (Conceptual WQMP) has been prepared for the Project which is intended to comply with the requirements of the County of Orange National Pollutant Discharge Elimination System (NPDES) Stormwater Program requiring the preparation of the plan as well as provide necessary information adequate for CEQA purposes.[1] A final, design-level WQMP will be prepared reflect up-to-date conditions on the site consistent with the current County of Orange Planning Department discretionary planning application submittal requirements, the Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District (OCFCD) and the incorporated Cities of Orange County within the Santa Ana Region. Information in this section is largely based on information and findings obtained in the following documents:

- *CEQA Drainage Study for Cielo Vista* (herein referred to as the "Drainage Study"), prepared by Tory R. Walker Engineering, Inc., August 9, 2013;
- *Hydrology Study (Onsite) for Cielo Vista Subdivision,* prepared by Charles Hartman & Associates, March 28, 2013;
- *Technical Memorandum Summary of Unit Hydrograph Analysis for Hydromodification Compliance of Cielo Vista, Yorba Linda, CA* (herein referred to as the "Technical Drainage Memorandum"), prepared by Tory R. Walker Engineering, Inc. April 9, 2013; and
- County of Orange/Santa Ana Region Priority Project Conceptual WQMP: Cielo Vista Tentative Tract 17341, prepared by Charles Hartman & Associates July 10, 2013.

All report documents listed above are included in Appendix H of this EIR.

[1] *Effective August 17, 2011, each discretionary planning application submittal in the County must include a "Conceptual Water Quality Management Plan (WQMP)" or "Conceptual Water Quality Plan (WQP)" unless exempt; and, the approval of a "Final Priority Project WQMP" or "Final Non-Priority WQMP" prior to grading or building permit issuance. Please refer to www.ocplanning.net/water for further details regarding the County's requirements for submittal of Conceptual and Final WQMPs.*

1. ENVIRONMENTAL SETTING

a. Regulatory Framework

(1) Federal

(a) Clean Water Act

The Clean Water Act (CWA) was implemented to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. The CWA was created in 1972, and then amended in 1977, and again in 1987 when the NPDES program was created. The United States Environmental Protection Agency (US EPA) has delegated responsibility for implementation of portions of the CWA, including water quality control planning and control programs, such as the NPDES Program to the California State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCBs). While the NPDES system is administered by federal and State programs, the local authority provides the specific details with which projects must comply. Thus, the NPDES program, as implemented in the County of Orange is described in detail under the Local regulations.

(b) Total Maximum Daily Loads

Section 303(d) of the CWA established the Total Maximum Daily Load (TMDL) Program. The purpose of the TMDL program is for states to identify streams, lakes, and coastal waters that do not meet certain water quality standards and are not expected to meet standards solely through technology-based controls of point source discharges. For such watersheds, a TMDL for the constituent(s) for which the water body is impaired must be determined.

The TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still achieve the target water quality objective. All sources of the constituent(s) must be identified and loads quantified. Load reductions are determined and then allocated among the sources. Finally, an implementation plan is prepared to achieve the load reductions. Pollution control strategies contained in the CWA are included in state and local requirements, such as NPDES permits.

(2) State

Responsibility for the protection of water quality in California resides with SWRCB and nine RWQCBs. The SWRCB establishes statewide policies and regulations for the implementation of water quality control programs mandated by federal and state water quality statutes and regulations. The RWQCBs develop and implement Water Quality Control Plans (Basin Plans) that consider regional beneficial uses, water quality characteristics, and water quality problems. The Santa Ana RWQCB (SARWQCB) implements a number of federal and State laws, the most important of which are the State Porter-Cologne Water Quality Control Act (described below) and the Federal CWA.

All projects resulting in discharges, including the Project, whether to land or water, are required to obtain approval of Waste Discharge Requirements (WDRs) by the RWQCBs. Land and groundwater related WDRs (i.e., non-NPDES WDRs) regulate discharges of privately or publicly treated domestic wastewater and process and wash-down wastewater. WDRs for discharges to surface waters also serve as NPDES permits, which are further described below.

(a) Porter-Cologne Water Quality Act

The State of California's Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California, including the California Toxics Rule (CTR), Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Plan or SIP), Inland Surface Water Quality Standards, California Urban Water Management Act, and NPDES permits. The SWRCB administers water rights, water pollution control, and water quality functions throughout the state, while the RWQCBs conduct planning, permitting, and enforcement activities. The Porter-Cologne Water Quality Control Act authorizes the SWRCB to adopt, review, and revise policies for all waters of the state (including both surface and groundwater) and directs the RWQCBs to develop regional Basin Plans. Section 13170 of the California Water Code also authorizes the SWRCB to adopt water quality control plans on its own initiative.

(b) Waste Discharge Requirements (WDRs)

The water quality objectives are achieved primarily through the establishment and enforcement of WDRs. All dischargers of waste to waters of the State are subject to regulation under the Porter-Cologne Act. This includes both point and diffuse source dischargers. All current and proposed discharges to land must be regulated under WDRs, waivers of WDRs, a basin plan prohibition, or some combination of these administrative tools. Discharges of waste directly to State waters would be subject to an individual NPDES permit, which also serves as a WDR.

The RWQCBs have primary responsibility for issuing WDRs. The RWQCBs may issue individual WDRs to cover individual discharges or general WDRs to cover a category of discharges. WDRs may include effluent limitations or other requirements that are designed to implement applicable water quality control plans, including designated beneficial uses and the water quality objectives established to protect those uses and prevent the creation of nuisance conditions.

(c) National Pollutant Discharge Elimination System (NPDES)

The SWRCB and RWQCBs also implement, monitor, and enforce the NPDES storm water permitting and waste discharge requirements within their jurisdiction. In general, the regulations require all communities with populations over 50,000 to develop programs for reducing pollutants carried by stormwater runoff into waters of the United States. The SWRCB and RWQCBs also develop and implement state or regional general permits regulating certain types of discharges. These permits serve as the mechanism for enforcement of the program.

NPDES General Permit for Storm Water Discharges Associated with Construction Activity (Construction General Permit)

The SWRCB permits all regulated construction activities under the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (Order No. 2009-009-DWQ [NPDES No. CAS000002]). The permit requires a risk-based permitting approach, dependent upon the likely level of risk created by a project. In accordance with NPDES regulations, to minimize the potential effects of construction runoff on receiving water quality, California requires that any construction activity affecting 1 acre or more must obtain coverage under the Construction General Permit.

The Construction General Permit requires projects that disturb 1 or more acres obtain coverage under the Construction General Permit. This includes submittal of a Notice of Intent (NOI) to comply with permit conditions and the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which must be prepared before construction and coverage under the Construction General Permit begins. Components of SWPPPs typically include specifications for best management practices (BMPs) to be implemented during project construction for the purpose of minimizing the discharge of pollutants in storm water from the construction area. In addition, a SWPPP includes measures to minimize erosion from and stabilization of disturbed surfaces, which is also incorporated into a WQMP in accordance with the Orange County Municipal Stormwater NPDES Permit, after construction is completed, and identifies a plan to inspect and maintain project BMPs and facilities during construction. Because the Project would disturb more than 1 acre, construction would be subject to the Construction General Permit.

(3) Local/Regional

(a) Santa Ana River Basin Water Quality Control Plan (Basin Plan)

The SARWQCB (Region 8) has jurisdiction over the Santa Ana River Basin (SARB). The SARWQCB is required by law to develop, adopt, and implement a Water Quality Control Plan for the entire region. The SARB Plan, which covers the Lower Santa Ana River and the project site, was last updated by SWRCB in February 2008 and contains additional non-substantive editorial corrections completed in June 2011. The principal elements of the Water Quality Control Plan are a statement of beneficial water uses that the SARWQCB will protect; water quality objectives needed to protect the designated beneficial water uses; and strategies and time schedules for achieving the water quality objectives. The water quality objectives are achieved primarily through the establishment and enforcement of WDRs. Both beneficial uses and water quality objectives comprise the relevant water quality standards.

The SARB Plan specifically: (1) designates beneficial uses for surface and ground waters; (2) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's anti-degradation policy; and (3) describes implementation programs to protect all waters in the region. In cases where the Basin Plan does not contain criteria for a particular pollutant, other criteria are used to establish a water quality objective. These may be applied from SWRCB documents (e.g., the Inland Surface Waters Plan and the Pollutant Policy Document) or from water quality criteria developed under Section 304(a) of the Clean Water Act (e.g., California Toxics Rule).

The SARWQCB has set water quality objectives for all surface waters in the region. Chemical constituents are regulated depending upon the beneficial use of the water body. Water quality objectives are also set for groundwater and enclosed bays and estuaries. The Project would be subject to the requirements of the Basin Plan.

(b) General Waste Discharge Requirements for Discharges to Surface Waters That Pose An Insignificant (*De Minimus*) Threat to Water Quality (*De Minimus* Threat General Permit)

Low threat discharges are regulated under Order No. 2009-0030 (NPDES No. CAS618030) Waste Discharge Requirements for Discharges for the County of Orange, OCFCD and the incorporated cities of Orange County within the Santa Ana Region. Construction dewatering wastes (except stormwater) are regulated as *de minimus* threat discharges to surface waters that are subject to the terms and conditions of this Order and all dischargers must comply with the effluent limitations specified in the Construction General Permit Order No.

2009-009-DWQ CAS 000002. Historic high groundwater levels within the project site range from 0 to 30 feet. These levels are reflective of the canyon areas in the southern portion of the site. Significant excavation of the canyon areas is not anticipated as part of the Project and as such, dewatering is not anticipated. Regardless, in the unanticipated event that groundwater is encountered and dewatering is necessary, the Project would need to comply with the applicable NPDES and Construction General Permits.

(c) Orange County Municipal Stormwater NPDES Permit (Stormwater NPDES Permit)

Stormwater discharges are also currently regulated under the fourth-term regional individual permit—Santa Ana Region Waste Discharge Requirements for the County of Orange, OCFCD, and The Incorporated Cities of Orange County within the Santa Ana Region Areawide Urban Stormwater Runoff Orange County (Order No. R8-2009-0030 [amended by Order No. R8-2010-0062], NPDES No. CAS618030) (Municipal NPDES Permit).

The co-permittees of this Municipal NPDES Permit are responsible for the management of storm drain systems within their jurisdictions and are required to implement management programs, monitoring programs, implementation plans and all BMPs outlined in the DAMP within each respective jurisdiction, and take any other actions as may be necessary to meet the Maximum Extent Practicable (MEP) standard. The Municipal NPDES Permit differs from the Construction General Permit in that it regulates stormwater runoff from sites and activities following construction, as opposed to during construction activities.

This Municipal NPDES Permit requires that discharges from the Municipal Separate Storm Sewer Systems (MS4s) (discussed below) shall not cause or contribute to exceedances of receiving water quality standards (designated beneficial uses and water quality objectives) for surface waters or groundwaters. The DAMP and its components shall be designed to achieve compliance with receiving water limitations. It is expected that compliance with receiving water limitations will be achieved through an iterative process and the application of increasingly more effective BMPs. The existing DAMP will have to be revised in accordance with the fourth-term Municipal NPDES Permit.

Provisions for compliance inspection are incorporated in the Municipal NPDES Permit and include requirements for site inspections, including review of erosion and sediment control and BMP implementation plans and effectiveness for residential projects and commercial and industrial developments. Each co-permittee is also required to enforce its ordinances and permits at all construction sites.

Requirements for new development and significant re-development include the establishment of a mechanism to ensure (prior to issuance of any local permits or other approvals) that all construction sites that are required to obtain coverage under the State's Construction General Permit for construction activities have filed an NOI with the State Board to be covered by the relevant construction permit and that a SWPPP is prepared and implemented.

This Municipal NPDES Permit also includes requirements for periodic stormwater monitoring for the County of Orange, OCFCD, and Incorporated Cities of Orange County within the Santa Ana Region Areawide Urban Stormwater Runoff area.

Under the Municipal NPDES Permit, each permittee shall ensure that an appropriate WQMP is prepared for the following categories of new development/significant redevelopment projects:

- All significant redevelopment projects, where significant redevelopment is defined as projects that include the addition or replacement of 5,000 square feet or more of impervious surface on a developed site.
- New development projects that create 10,000 square feet or more of impervious surface (collectively over the entire project site).
- Automotive repair shops (with SIC codes 5013, 5014, 5541, 7532-7534, 7536-7539).
- Restaurants where the land area of development is 5,000 square feet or more.
- All hillside developments on 5,000 square feet or more, which are located on areas with known erosive soil conditions or where the natural slope is twenty-five percent or more.
- Developments of 2,500 square feet of impervious surface or more, adjacent to (within 200 feet) or discharging directly into environmentally sensitive areas, such as areas designated in the Ocean Plan as Areas of Special Biological Significance or waterbodies listed on the CWA Section 303(d) list of impaired waters.
- Parking lots of 5,000 square feet or more of impervious surface exposed to storm water.
- Streets, roads, highways and freeways of 5,000 square feet or more of paved surface shall incorporate USEPA guidance, "Managing Wet Weather with Green Infrastructure: Green Streets" in a manner consistent with the maximum extent practicable standard.
- Retail gasoline outlets of 5,000 or more square feet with a projected average daily traffic of 100 or more vehicles per day.
- Emergency and public safety projects in any of the above-listed categories may be excluded if the delay caused due the requirement for a WQMP compromises public safety, public health and/or environmental protection.

The Project qualifies as a Priority Project as it would result in greater than 10,000 square feet of impervious surface on the project site. As such, a WQMP is required for the proposed project.

The revised MS4 permit requires the Model WQMP to incorporate new Low Impact Development (LID) provisions and to address the impact of urbanization on downstream hydrology. The revised Model WQMP requires that each "priority project" infiltrate, harvest and use, evapotranspire, or biotreat the "design capture volume" associated with the 85th percentile storm event. This is equivalent to retention or treatment of 80 percent of the average annual runoff volume. Any portion of the design capture volume that is not treated on the project site by LID BMPs must be treated and discharged per specific conditions of the permit.

The MS4 Permit also requires "priority projects" to identify Hydrologic Conditions of Concern (HCOCs). HCOCs occur when there is a potential for increased runoff that can cause significant impacts on downstream channels and aquatic habitats, alone or in conjunction with impacts of other projects. Such impacts are termed "hydromodification," which is defined as the alteration of natural flow characteristics and sediment supply in streams and channels due to urbanization. If HCOCs are identified, the project must implement

BMPs to mitigate hydromodification. As indicated in the Conceptual WQMP prepared for the Project, streams located downstream from the project site could be potentially susceptible to hydromodification impacts due to increased flow rates as a result of new impervious surfaces to be developed as part of the Project, which is a potential HCOC. Thus, the Project must implement on-site or regional hydromodification controls such that post development runoff volume for the two year frequency storm does not exceed that of the pre-development condition by more than five percent, and time of concentration of post development runoff for the two year storm event is not less than that for the pre-development condition by more than five percent. Please refer to the impact analysis below for a description and analysis of the BMPs proposed by the Project to mitigate potential hydromodification impacts.

(d) County of Orange - Erosion and Sediment Control

The County of Orange requires that prior to the issuance of any grading or building permit, a project applicant must submit an Erosion and Sediment Control Plan (ESCP) in a manner meeting approval of the Manager, Permit Services, to demonstrate compliance with the County's NPDES Implementation Program and state water quality regulations for grading and construction activities. The ESCP must identify how all construction materials, wastes, grading or demolition debris, and stockpiles of soil, aggregates, soil amendments, etc. would be properly covered, stored, and secured to prevent transport into local drainages or coastal waters by wind, rain, tracking, tidal erosion or dispersion. The ESCP must also describe how the applicant would ensure that all BMPs are maintained during construction of any future public right-of-ways.

(e) County of Orange Local Implementation Plan

Per the requirements in the DAMP and the MS4 permit, the County of Orange and the OCFCD adopted a Local Implementation Plan (LIP) containing the policy and implementation documents for compliance with the DAMP. Section A-7 of the County's LIP contains the new development and redevelopment component based upon the Orange County Model WQMP. Using the LIP as a guide, the County would approve WQMPs for new development and redevelopment projects within its jurisdiction as part of the development plan and entitlement approval process.

As discussed above, the Project is considered a "priority project" as defined in the DAMP and therefore must prepare a Project WQMP. A Conceptual WQMP has been prepared for the Project and is provided in an Appendix H of this EIR. One of the requirements for WQMPs pursuant to the County's LIP program is that all priority new development and significant redevelopment projects are required to develop and implement a Project WQMP that includes:

- A site assessment to identify Project Pollutants of Concern, HCOCs, Environmentally Sensitive Areas (ESAs), and Areas of Special Biological Significance (ASBSs).
- Development of design standards consistent with the revised Model WQMP (i.e., determination of the Design Capture Volume for on-site retention, pre-development runoff volume, and time of concentration).
- Consideration and selection of on-site LID and hydromodification controls, and routine structural and non-structural source-control BMPs in compliance with the revised Model WQMP, and alternative compliance plans if a project cannot fully meet the LID requirements.

- The mechanisms by which long-term operation and maintenance of all structural BMPs would be provided.

(f) Orange County General Plan

The County's General Plan contains a goals and policies that are relevant to hydrology and water quality, which are presented in the General Plan Land Use Element and Resources Element. The Project's consistency with the applicable goals and policies of these elements is discussed in the impact analysis below.

(g) City of Yorba Linda General Plan

The City's General Plan contains goals and policies that are relevant to hydrology and water quality in the General Plan Land Use Element and Safety Element. The Project's consistency with the applicable goals and policies of these elements is discussed in the impact analysis below.

b. Existing Conditions

(1) Regional Hydrology and Drainage

The project site is located within the SARB, a 2,800-square-mile area located roughly between Los Angeles and San Diego. The SARB is a group of connected inland basins and open coastal basins drained by surface streams flowing generally southwestward to the Pacific Ocean. The SARB can be divided into an upper basin and a lower basin, with the project site being located within the lower basin drainage. Receiving waters from drainage within the project area include the Santa Ana River (Orange County channel E-06 to E-01). The Santa Ana River is classified as "Watershed E" in the North Orange County Integrated Regional Water Management Plan (NOC IRWMP) area, a 210-square-mile watershed draining to the Santa Ana River and specifically to the Lower the Santa Ana River. The lower Santa Ana River has been channelized and modified so that in most years flow does not reach the Pacific Ocean, but is used to recharge groundwater instead. Per the NOC IRWMP, as shown on the Lower Santa Ana River ESA Map (for Watershed E), the project is not adjacent to an ESA, nor does it discharge directly into an ESA. Also noted is that the project site is located within the Santa Ana Hydrologic Basin Planning Area 801.13, Santa Ana Narrows.

The OCFCD is responsible for the design, construction, operation, and maintenance of regional flood control facilities. The County flood channels are maintained annually, and maintenance includes debris and vegetation removal. The existing storm drainage channels were originally designed to accommodate 25-year flood events or less, which was the standard at the time.[2] However, when the channels were constructed, they were generally built to accommodate only 65 percent of the 25-year flood event. The channels were built with restrictive channel bottoms, which reduce the amount of water the channel can carry and slows the flow rate of runoff water. The County now uses 100-year flood event standards for new storm drain construction and drainage improvements, and portions of the existing channels have been improved to accommodate up to a 100-year flood event.

[2] *The 25-year flood event has a 4 percent chance of occurring in any given year. The 100-year flood event has a 1 percent chance of occurring in any given year.*

In the project vicinity, both the Esperanza and Blue Mud Canyon flood control facilities are owned and maintained by the OCFCD and outlet to the Lower Santa Ana River, approximately two miles south of the project site. These facilities are built to accommodate a 100-year storm event.

(2) Local and Project Site Drainage

The approximate 84-acre project site is characterized by steeply sloping hillsides vegetated by scrub and chaparral. Runoff from the site is directed to drainages that slope southwesterly at slopes varying from two percent (2%) to areas as steep as 1.5:1. Side slopes canyons to which the drainages are located have slopes up to 2:1 with some locally steeper and flatter elements. Elevations range from 560 feet above mean sea level (MSL) in the southern portions of the project site, to approximately 885 feet above MSL at the highest point in the northern portions of the project site. With the exception of the few on-site oil production facilities, the site is nearly 100 percent pervious area.

For purposes of this hydrology discussion, the project site is generally described as consisting of two distinct areas: the North Site (approximately 42.7 acres, which includes Planning Area 2) and the South Site (approximately 41.3 acres, which includes Planning Area 1). The North Site generally includes the area north of Planning Area 1, including Planning Area 2 and the expansive open space area proposed by the Project. The South Site generally includes Planning Area 1.

Natural runoff from the undeveloped site area flows in a westerly direction towards two receiving storm drain systems located at Stonehaven Drive to the south (referred to as the "Southern Boundary") and San Antonio Road to the west of the project site (referred to as the "Western Boundary"). These are the two points of outlet within the project site. The North Site drains to the Western Boundary, while the South Site drains to the Southern Boundary. The project site is downstream of four significant offsite natural tributary areas that drain via overland flow through natural flow paths, which are ultimately intercepted by the aforementioned drainage systems. The four tributary areas (Creeks A, B, C, and D) that pass through the project site are illustrated in **Figure 4.8-1**, *Hydrology Map*.

Runoff from the North Site, inclusive of three large offsite tributaries (Creeks B, C and D), converge onsite prior to discharging at the western project boundary. The flows continue to drain via overland flow where they are intercepted by the drainage channel located adjacent to San Antonio Road.

With regards to the South Site, Wire Springs Canyon (Creek A), a large offsite natural tributary area located to the west of the project site, drains to the receiving southern portion of the project site, discharging to the receiving box culvert (8-feet by 7-feet) storm drain located within Stonehaven Drive. Both the Stonehaven Drive and San Antonio Road facilities are owned and maintained by the OCFCD and outlet to the Santa Ana River, approximately two miles south of the project site.[3] These storm drain facilities currently have adequate capacity to accommodate existing storm flows. **Table 4.8-1**, *Existing Conditions (North Site): 2-Year and 100-Year Peak Flows – Western Boundary* and **Table 4.8-2**, *Existing Conditions (South Site): 2-Year and 100-Year Peak Flows – Southern Boundary*, summarizes the 2- and 100-year peak flows under existing conditions at each boundary. Figure 4.8-1 illustrates the locations of the western and southern project site boundaries.

[3] C*EQA Drainage Study for Cielo Vista, prepared by Tory R. Walker Engineering, Inc., March 27, 2013.*

Table 4.8-1

Existing Conditions (North Site): 2-Year and 100-Year Peak Flows – Western Boundary

Discharge Location	Drainage Area (Ac)	2-Year Peak Flow (cfs)	100-Year Peak Flow (cfs)
Creek B	224	131.0	459.2
Creek C	717	327.9	1,235.3
Creek D	473	275.6	968.1
Total: Confluence of Creeks B, C, & D	**1,414**[a]	**647.0**[b]	**2,425.9**[b]

Ac = acres; cfs = cubic feet per second.

[a] *In order to provide the peak flow at the confluence of Creeks B, C, and D at the Western Boundary, a single design storm was created for use in all three creeks by using correction factors based on the total area of the Creeks B, C, and D.*

[b] *Peak flow for the confluence of Creeks B, C, & D is not equal to the sum of the individual peak flows for each creek as the peak flow in the hydrograph of Creek C occurs five minutes after the peak flows in Creeks B and D. Consequently, the peak discharge at the confluence is approximately 90 cfs and 200 cfs lower than the total sum of the partial peak flows for the 2-year peak flow and 100-year peak flow, respectively.*

Source: CEQA Drainage Study for Cielo Vista, prepared by Tory R. Walker Engineering, Inc., August 9, 2013; and Technical Memorandum Summary of Unit Hydrograph Analysis for Hydromodification Compliance of Cielo Vista, Yorba Linda, CA, prepared by Tory R. Walker Engineering, Inc. April 9, 2013.

Table 4.8-2

Existing Conditions (South Site): 2 -Year and 100-Year Peak Flows – Southern Boundary

Discharge Location	Drainage Area (Ac)	2-Year Peak Flow (cfs)	100-Year Peak Flow (cfs)
Creek A	**674**[a]	**296.6**[1]	**1,125.3**

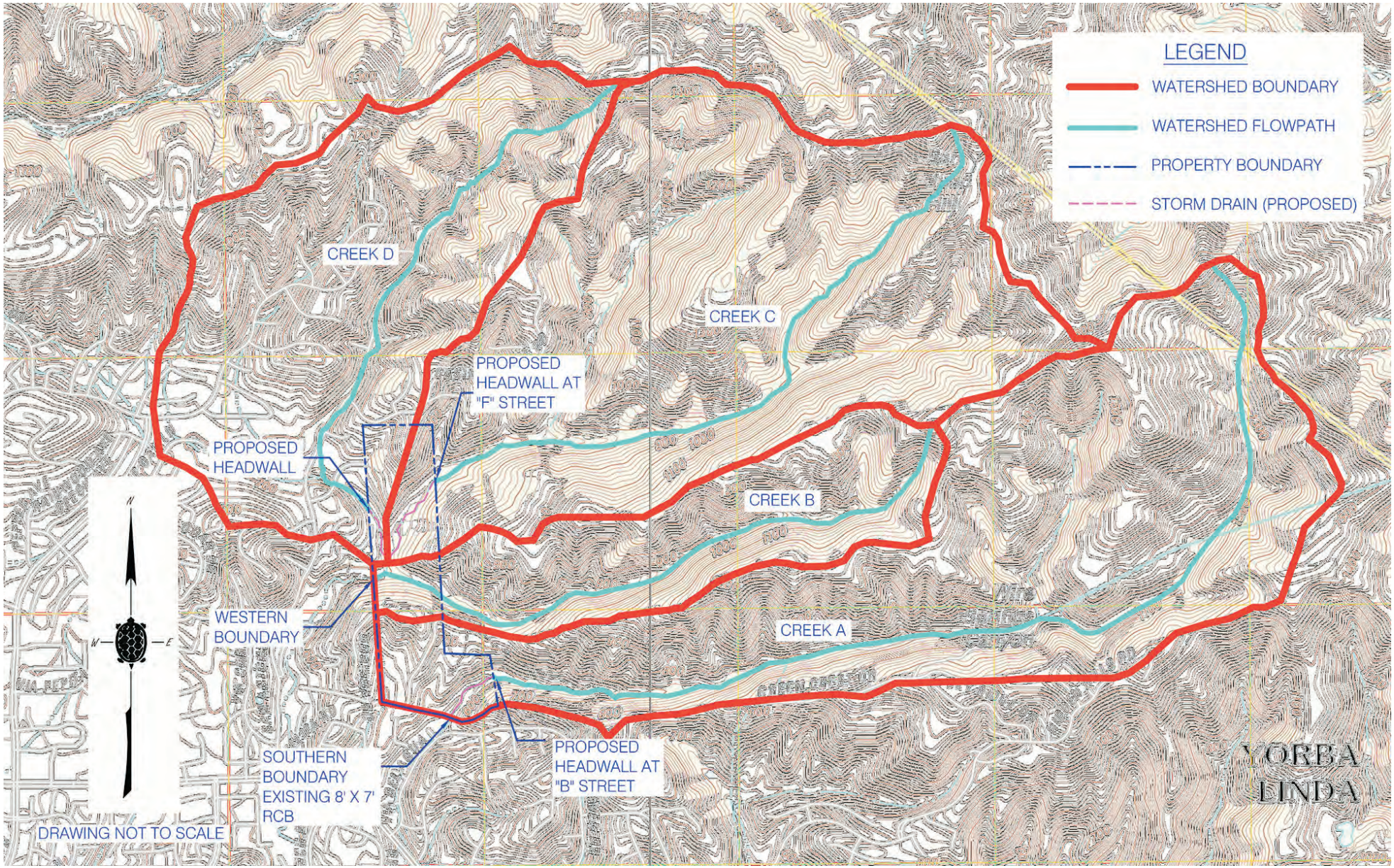
Ac = acres; cfs = cubic feet per second.

[a] *A separate design storm was created for Creek A as no confluence analysis was required for this creek at the Southern Boundary.*

Source: CEQA Drainage Study for Cielo Vista, prepared by Tory R. Walker Engineering, Inc., August 9, 2013; and Technical Memorandum Summary of Unit Hydrograph Analysis for Hydromodification Compliance of Cielo Vista, Yorba Linda, CA, prepared by Tory R. Walker Engineering, Inc. April 9, 2013.

Soils in the area of the project site are noted as groups B, C & D on the Orange County Hydrologic Classification of Soils Map, Plate A.[4] Initial geotechnical studies confirm there is a mix of sands, silts, and clays on the site. Soil groups D and C dominate each catchment with only small patches of type B in some areas; refer to Soil Type Maps in Appendix H. Both group D and group C soils have slow infiltration rates when saturated. Group D consists chiefly of clay soils with a high swelling potential, clay pan or clay layer at or near the surface, or shallow soils over nearly impervious materials. Group D soils have a very slow rate of water transmission resulting in losses due to infiltration would be relatively low for all catchments.

[4] *Highest infiltration and lowest runoff is associated with Hydrologic Group A, and lowest infiltration and highest runoff is associated with soil Hydrologic Group D.*



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Hydrology Map

Cielo Vista Project
Tory R. Walker Engineering, Inc., 2013.

FIGURE
4.8-1

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(3) Water Quality

Storm water discharges from the urbanized areas in Orange County consist mainly of surface runoff from residential, commercial, and industrial developments. In the project vicinity, storm water discharges also include stormwater discharges from undeveloped lands.

Urban runoff pollutants include a wide array of environmental, chemical, and biological compounds from both point and nonpoint sources. Point sources of water pollution come from a single, discrete place, such as a pipe. Nonpoint source pollution comes from many diffuse sources and generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. Typical urban runoff consists primarily of suspended sediments, fertilizers and pesticides, animal waste, and contaminants that are commonly associated with automobiles (e.g., petroleum compounds such as oil, grease, and hydrocarbons). In addition, urban stormwater often contains high levels of soluble and particulate heavy metals generated from traffic, industrial facilities, and occasionally, residential sources. In the urban environment, stormwater characteristics depend on site characteristics (e.g., land use, perviousness, pollution prevention, types and amounts of BMPs), rain events (duration, amount of rainfall, intensity, and time between events), operations and maintenance practices (e.g., street sweeping), soil type and particle sizes, multiple chemical conditions, the amount of vehicular traffic, and atmospheric deposition. The US EPA estimates that short-term runoff from construction sites, without adequate erosion and runoff control measures, can contribute more sediment to receiving waters than that which is deposited by natural processes over a period of several decades.[5]

In undeveloped areas, runoff typically consists primarily of suspended sediments, fertilizers and pesticides, and animal waste.

Currently, there are no known significant pre-existing water quality problems from surface water runoff associated with the project site. However, the site does include oil production facilities, which during heavy rain events, have the potential to cause petroleum-related contaminates to enter stormwater runoff.

The Lower Santa Ana River is on the 303(d) list of impaired waters for pathogens (fecal coliform bacteria). Pathogens are agents or organisms that can cause diseases or illnesses, such as bacteria, viruses, and protozoa. Routine monitoring of pathogenic organisms was historically not practical because they are usually present in small quantities and require fairly complicated and expensive sampling and analyses. Although these conditions have changed with the introduction of new technologies, current regulations continue to rely on fecal indicator bacteria (FIB) for pathogens.

(4) Groundwater

Based on a review of the State of California Seismic Hazard Zone Report for the Yorba Linda 7.5-Minute Quadrangle, historic high ground water is estimated to be from 0 to 30 feet below the surface in the canyon area in the southern portion of the site.[6]

[5] *U.S. Environmental Protection Agency (U.S. EPA), Establishment of Numeric Criteria for Priority Pollutants for the State of California; California Toxics Rule. EPA-823-F-97-008. 1997.*

[6] *LGC Geotechnical, Inc., Geotechnical Feasibility Study Proposed Development of Tentative Tract Map No. 17341, County of Orange, California. August 2, 2012.*

2. ENVIRONMENTAL IMPACTS

a. Methodology

The evaluation of hydrology and water quality impacts considers applicable regulatory requirements that would apply to the Project during construction and operation. Per the County of Orange drainage criteria, the Unit Hydrograph method [per Section B.4 of the Orange County Hydrology Manual (OCHM)] was utilized in the Drainage Study and Technical Drainage Memorandum to analyze 2- and 100-year peak flow rates from the project site in existing and proposed developed conditions to the two points of outlet from the project site.[7],[8] The results of these studies are included within the analysis to determine the Project's consistency with the current Orange County hydromodification requirements. In accordance with County requirements, a Conceptual WQMP was prepared for the Project which provides the basis for determining the Project's consistency with current applicable hydrology and water quality regulatory requirements. Further, the WQMP identifies project design features (i.e., BMPs) to minimize pollutants from site runoff, as well as drainage facilities, which demonstrate the Project's ability to minimize potential impacts related to hydrology and water quality. Considering the Project characteristics and the existing conditions, hydrology and water quality impacts are evaluated in response to the Thresholds of Significance identified below, and a mitigation measure was prescribed, where applicable. All report documents referenced above are included in Appendix H of this EIR.

b. Thresholds of Significance

Appendix G of the *CEQA Guidelines* and the County of Orange Environmental Analysis Checklist provide thresholds of significance to determine whether a project would have a significant environmental impact regarding hydrology and water quality. Based on the size and scope of the Project and the potential for hydrology and water quality impacts, the thresholds below are include for evaluation in this EIR. Please refer to Section 6.0, *Mandatory Findings of Significance*, for a discussion other issues associated with evaluation of hydrology and water quality where the characteristics of the Project made it clear that effects would not be significant and further evaluation in this section was not warranted.

Would the Project:

Threshold 1: Violate any water quality standards or waste discharge requirements (refer to Impact Statement 4.8-1);

Threshold 2: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted) (refer to Impact Statement 4.8-3);

[7] *A hydrograph is a graph of the water level or rate of flow of a body of water as a function of time, showing the seasonal change.*

[8] *The unit hydrograph method is used for watersheds larger than 640 acres to estimate peak discharges and volumes of stormwater runoff. This method produces a graph of discharge vs. time for the entire length of a storm.*

Threshold 3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site (refer to Impact Statement 4.8-2);

Threshold 4: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off the site (refer to Impact Statement 4.8-2);

Threshold 5: Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff (refer to Impact Statement 4.8-2); and

Threshold 6: Otherwise substantially degrade water quality (refer to Impact Statement 4.8-1).

c. Project Design Features

The Project would implement Project Design Features (PDFs), which would include numerous BMPs reflected in the Project's Conceptual WQMP, SWPPP, and drainage plans, which would prevent the occurrence and/or minimize the significance of potential hydrology and water quality impacts. These PDFs and BMPs are described below.

PDF 8-1: The Project would implement a Water Quality Management Plan (WQMP) and a Storm Water Pollution Prevention Plan (SWPPP). The WQMP would include detailed sizing parameters for the basins and would provide guidelines for the proper maintenance of the water quality basins. The WQMP and SWPPP would identify the BMPs to be implemented by the Project that would reduce pollution levels in stormwater discharge in compliance with applicable water quality standards. These plans would be reviewed and approved by the Manager, OC Planning prior to recordation of the subdivision map.

The following discussion provides an overview of the SWPPP and the Conceptual WQMP.

(1) Storm Water Pollution Prevention Plan

The Construction General Permit requires projects that disturb 1 or more acres of soil, or projects that disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres obtain coverage under the Construction General Permit. Accordingly, the Project would prepare and implement a SWPPP, which must be prepared before construction and coverage under the Construction General Permit begins. The SWPPP would include BMPs to be implemented during Project construction for the purpose of minimizing the discharge of pollutants in storm water from the construction area. In addition, the SWPPP would include measures to minimize erosion from and stabilization of disturbed surfaces. The SWPPP would include, but may not be limited to, BMPs such as the following:

- Silt fencing and straw bale barriers would be placed along the perimeter of the area to be cleared and graded before any clearing or grading takes place. Supersilt fencing would be used on steep slopes at appropriate locations.

- No construction materials would be buried on-site.
- All personnel would be instructed regarding the correct procedure for waste disposal.
- Good housekeeping and spill control practices would be followed during construction to minimize storm water contamination from petroleum products, fertilizers, paints, and concrete. Good housekeeping practices are listed below.
  - All vehicles on site would be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage.
  - Petroleum products would be stored in tightly sealed containers which are clearly labeled.
  - Spill kits would be included with all fueling sources and maintenance activities.
  - Any asphalt substances used onsite would be applied according to the manufacturer's recommendation.
  - Sanitary waste would be collected from portable units a minimum of two times a week to avoid overfilling.
  - A covered dumpster would be used for all waste materials.
  - All paint containers and curing compounds would be tightly sealed and stored when not required for use. Excess paint would not be discharged to the storm system, but would be properly disposed according to the manufacturer's instructions.
  - Materials and equipment necessary for spill cleanup would be kept in the temporary material storage trailer onsite. Equipment would include, but not be limited to, brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, saw dust, and plastic and metal trash containers.
  - Spray guns would be cleaned on a removable tarp.
  - All spills would be cleaned up immediately upon discovery.
  - Concrete trucks would not be allowed to wash out or discharge surplus concrete or drum wash water on the site.
  - A stabilized construction entrance would be constructed to reduce vehicle tracking of sediments.
  - The paved street adjacent to the site entrance would be swept daily to remove excess mud, dirt, or rock tracked from the site.

Structural BMPs would be coordinated with construction activities so the BMP is in place before construction begins. The following BMPs would be coordinated with construction activities:

- The temporary perimeter controls (silt fences and straw bails) would be installed before any clearing and grading begins. The temporary perimeter controls (silt fencing and straw bails) would not be removed until all construction activities at the site are complete and soils have been stabilized.
- Clearing and grading would not occur in an area until it is necessary for construction to proceed.
- The stabilized construction site entrance would be constructed before clearing and grading begins.
- Once construction activity ceases permanently in an area, that area would be stabilized with permanent seed and mulch.

(2) WQMP Features

A Conceptual WQMP has been prepared for the Project which is intended to comply with the requirements of the County of Orange NPDES Stormwater Program requiring the preparation of the plan. The WQMP included in Appendix H of this EIR is a conceptual plan intended to provide necessary information adequate for CEQA purposes. **Figure 4.8-2**, *Project Drainage-BMP Plan*, provides an illustration of the structural BMPs that would implemented by the Project. The final, design-level WQMP would reflect up-to-date conditions on the site consistent with the current Orange County DAMP and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, OCFCD and the incorporated Cities of Orange County within the Santa Ana Region. The Project would include, but may not be limited to, the following BMPs as outlined in the Project's Conceptual WQMP (BMP numbers correspond to those identified in the WQMP, where available):

Infiltration BMPs

BMP-I1 Infiltration Basins – The North Site would include an infiltration basin to retain flows and provide water quality treatment.

BMP-I2 Filterra Unit –Water quality treatment of runoff on the South Site would include 33 filterra units (or approved equivalent stormwater filters) with planter boxes 4 feet by 8 feet within the street right-of-way of the subdivision entrance. (This BMP is also listed under Biotreatment BMPs as BMP-BT3.)

Biotreatment BMPs

BMP-BT1 Dry Extended Detention Basins -Dry extended detention basins would be utilized to detain stormwater runoff and remove suspended solids/sediment.

BMP-BT2 Contech Stormfilters - Water quality treatment of runoff in the South Site would include the use Contech Storm Filters (or approved equivalent).

BMP-BT3 Filterra Unit - Water quality treatment of runoff in the South Site would include 33 filterra units (or approved equivalent stormwater filters) with planter boxes 4 feet by 8 feet within the street right-of-way of the subdivision entrance.

Hydromodification BMPs

BMP-HM1 Above Ground Detention Basins – The Project would provide onsite detention to ensure that the post development runoff volume for the two year, 24-hour peak flows do not exceed that of the pre-development condition by more than five percent, and the time of concentration of post development runoff for the two year storm event is not less than that for the pre-development condition by more than five percent. Details of the proposed detention system would be provided in the final, design-level WQMP. The basins would be inspected/maintained at a minimum before October 1st every year and after all major storm events.

Treatment Control BMPs

BMP-TC1 Contech Storm Filter - Stormwater would be treated by the actions of a series of cartridges. Under normal conditions all stormwater leaving the Contech Storm Filter (or approved equivalent stormwater filters) would be fully treated. During heavy storm events, excess runoff would be conveyed through the structure untreated through a bypass.

The filters would be cleaned out as necessary during inspection. Cartridges would be replaced every year, after any chemical spill, or as required by inspection to ensure proper function and drainage. The filters would be inspected at a minimum before October 1st every year and after all major storm events.

BMP-TC2 Filterra - Stormwater would be treated by entering the catch basin and flowing through several unique strata as treatment. The treated stormwater would be collected with a pipe several feet below the entrance flowline. These Filterra units (or approved equivalent stormwater units) would be installed with an impermeable liner to limit potential percolation and/or seepage into soil layers below.

BMP-TC3 Detention Basin – A detention basin would be constructed in the North Site to provide a volume of 10,980 cubic feet in an area 90 feet by 50 feet. The basin would have maximum 3:1 side slopes, would be vegetated, would have an open unlined bottom, and would have storm drains at both ends to accommodate inflows and outflows.

Non-Structural Source Control BMPs

BMP-N1 Education for Property Owners, Tenants, and Occupants - The Cielo Vista HOA would provide environmental awareness education materials, as attached to the Final WQMP, to all home owners and grounds maintenance personnel annually, and at staff changes. These materials would describe the use of chemicals (including household types) that should be limited to the property with no discharge of specified wastes via hosing or other direct discharge to gutters, catch basins and storm drains. The Cielo Vista HOA would provide information to the maintenance crew on general good housekeeping practices that contribute to protection of storm water quality. Thereafter, such materials would be available through the Cielo Vista HOA education program.

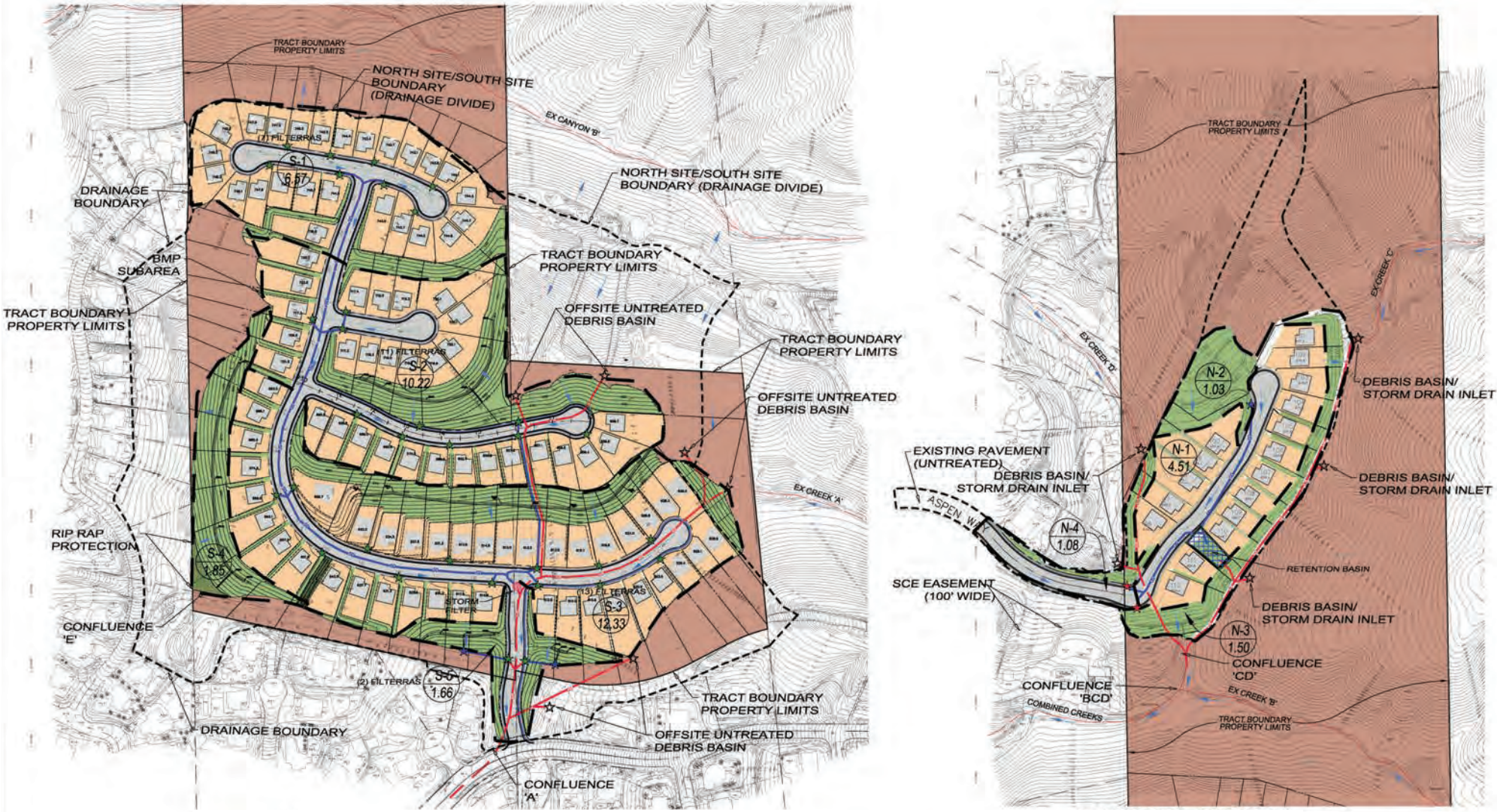
BMP-N2 Activity Restrictions –Conditions, Covenants, and Restrictions (CC&Rs) would be prepared for the purpose of surface water quality protection, or use restrictions would be developed through lease terms.

BMP-N3 Common Area Landscape Management - Ongoing Maintenance would be consistent with Orange County Landscape Irrigation Code, plus fertilizer and/or pesticide usage would be consistent with County Management Guidelines for Use of Fertilizers (DAMP Section 5.5).

BMP-N4 BMP Maintenance – The Cielo Vista HOA or another designated entity would be responsible for the inspection and maintenance of structural BMPs within their boundaries.

Planning Area 1

Planning Area 2



Legend

- Streets
- Sidewalks
- Individual Lot Landscaping/Hardscape
- H.O.A. Maintained Landscaping
- Water Quality Basin (North Site) Above & Underground
- Cointech Stormfilter
- Perimeter Drainage Inlets for Offsite Flow (Untreated)
- Catch Basin Stencilling & Signage
- Onsite Area Inlets Requiring Treatment
- Untreated Stormmwater
- Offsite Runoff and Mitigated
- Drainage flow Direction
- Overall Drainage Boundary (see separate drainage report)
- Subarea Drainage Areas per BMP calculations

PCR

N

0 300 Feet

Project Drainage-BMP Plan

Cielo Vista

Source: Charles Hartman & Associates, 2013.

FIGURE

4.8-2

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BMP-N11 Common Area Litter Control –Litter patrol, emptying of trash receptacles in common areas, and noting trash disposal violations by tenants/homeowners or businesses and reporting the violations to the owner/HOA for investigation would be conducted.

BMP-N14 Common Area Catch Basin Inspection – 80 percent of all privately maintained drainage facilities would be inspected each year and, if necessary, cleaned and maintained prior to the storm season, no later than October 1st each year; 100 percent of all privately-maintained drainage facilities would be inspected, cleaned and maintained in a two-year period. Drainage facilities include catch basins and inlets, water quality basins, detention basins, open drainage channels, and lift stations.

BMP-N15 Street Sweeping Private Streets and Parking Lots - Private streets would be swept at a minimum prior to the storm season, no later than October 1st each year.

Structural Source Control BMPs

BMP-S1 Storm Drain Stenciling –Provide storm drain stenciling and signage.

BMP-S3 Trash and Waste – Design and construct trash and waste storage areas to reduce pollution introduction.

BMP-S4 Irrigation Systems – Use efficient irrigation systems and landscape design, water conservation, smart controllers and source control.

BMP-S5 Slopes and Channels – Protect slopes and channels and provide energy dissipation. The Project would also incorporate requirements applicable to individual priority project categories (from SARWQCB NPDES Permit).

BMP-S12 Hillside Landscaping – There are a number of existing and proposed slopes on the project site. Where practical, established native vegetation would be protected in place on existing slopes. Native, drought-tolerant landscape species would be considered where practical for use on proposed slopes. Individual property owners and the Cielo Vista HOA staff would regularly inspect slopes for visible soil erosion. Bare areas would be revegetated and stabilized until a root system is firmly established.

The following PDFs have been identified for the Project pertaining to erosion and sediment control:

PDF 8-2: Riprap aprons or other types of energy dissipaters would be located at all points of concentrated discharge where flow velocity exceeds five feet per second (ft/s) to mitigate the outlet velocity so as to minimize the potential for downstream erosion. These points of discharge would not be limited to storm drain outlets but would also include brow ditches and other forms of storm water conveyance. Riprap aprons would be designed and sized in conformance with regional sizing criteria found in the "County of Orange Local Drainage Manual", dated August 2005. Other designs and sizing criteria can be found in the FHWA's "Hydraulic Engineering Circular Number 14, Third Edition" – HEC 14, including a "Riprap Basin" that could be used. Prior to the issuance of any grading or

building permit, the riprap aprons would be identified in the Project's Final Drainage Study to be reviewed and approved by the Manager, Permit Services.

PDF 8-3: Sediment basins would be located upstream of all proposed storm water conveyance systems within the project site. Prior to the issuance of any grading or building permit, the sediment basins would be identified in the Project's Final Drainage Study to be reviewed and approved by the Manager, Permit Services.

(3) Hydrology Features

The following PDFs have been identified for the Project to prevent the occurrence and/or minimize the significance of potential drainage and flooding impacts:

PDF 8-4: To be determined in consultation with County of Orange Public Works, if determined appropriate, the receiving storm drain within the project site (the headwall intercepts proposed at the end of "B" and "F" Streets) would be downsized by a 6-inch reduction in capacity to reduce the peak flow to existing conditions by throttling down flow, effectively detaining peak flows by the use of a hydraulic reduction. The ponding caused by such hydraulic reduction in capacity would be maintained on the project site, ensuring that no offsite property is impacted by attenuating the peak flow.[9] If this pdf is necessary, prior to the issuance of any grading or building permit, the storm drain sizing would be identified in the Project's Final Drainage Study to be reviewed and approved by the Manager, Permit Services.

PDF 8-5: All developed pad elevations would be constructed at a minimum of 3-feet (or greater) above the anticipated peak water surface elevation to ensure that no residential structure would be flooded within the project site. (This PDF to be verified prior to issuance of a building permit by the Manager, OC Planning.)

d. Analysis of Project Impacts

WATER QUALITY

Threshold	Would the project violate any water quality standards or waste discharge requirements?
Threshold	Would the project otherwise substantially degrade water quality?

4.8-1 Construction and operation of the Project would comply with all applicable regulatory requirements regarding water quality. Compliance with applicable regulatory requirements and implementation of the project design features, including BMPs as part of the Project's SWPPP and WQMP, would ensure that construction and operational water quality impacts are less than significant.

[9] *Appendix 4 of the Drainage Study includes illustrations of potential on-site detention basin locations.*

(a) Construction

Water Contaminants

Construction activities would include the use of heavy equipment and construction-related chemicals, such as fuels, oils, grease, solvents and paints that would be stored in limited quantities on-site. In the absence of proper controls, these construction activities could result in accidental spills or disposal of potentially harmful materials used during construction that could wash into and pollute surface waters or groundwater.

However, the Project would be subject to existing regulations associated with the protection of water quality. The applicable WDRs, the NPDES Construction General Permit for construction activities, and SWPPP (with associated BMPs) are considered protective of water quality during construction and would, therefore, prevent a substantial violation of water quality standards and minimize the potential for contributing additional sources of polluted runoff during construction of the Project. These existing regulations, programs, and policies would ensure that the potential for discharge of polluted stormwater from construction sites to affect beneficial uses of receiving waters and water quality standards, where applicable, would not be substantial. Examples of BMPs emanating from the SWPPP are: containing and infiltrating surface water runoff across the construction site; preventing construction materials from being buried onsite; construction staff instruction on proper waste disposal; and maintenance, upkeep and disposal practices to prevent surface water contamination from petroleum products, fertilizers, paints and concrete; and stabilizing graded areas through compaction and hydroseeding. Compliance with regulatory requirements would ensure that construction of the Project would not result in the exceedance of water quality standards during construction. Based on the above, construction-related impacts would be less than significant.

Erosion and Sedimentation

During construction, the project site would be subject to ground-disturbing activities (e.g., removal of the existing vegetation, excavation and grading, foundation and infrastructure construction, the installation of utilities). These activities would expose soils for a limited time, allowing for possible erosion and sediments to enter into runoff.

Although Project development has the potential to result in the erosion of soils, this potential would be reduced through standard erosion controls imposed during site preparation and grading activities. For instance, the Project would be subject to existing regulations associated with the protection of water quality. Specifically, construction activities would be carried out in accordance with the requirements of the NPDES General Construction Permit issued by the RWQCB and in accordance with the Project's SWPPP. The SWPPP would incorporate BMPs in accordance with County regulations to control erosion during the Project's construction period. BMPs could include, but are not limited to, the use of or implementation of: water bars, silt fences, staked straw bales, and good housekeeping practices during construction. Lastly, the Project would implement BMPs outlined in an ESCP, as required by the County, to reduce the potential for erosion during construction. With the implementation of standard erosion controls, impact with respect to erosion would be less than significant.

(b) Operation

Stormwater discharge is generated by rainfall that runs off the land and impervious surfaces such as paved streets, parking lots, and rooftops. During operation of the Project, pollutants of concern that could be

introduced to runoff or increased when compared to existing site conditions may include, but are not limited to, heavy metals, suspended solids, organic compounds, animal waste, pathogens, pesticides, oil and grease, fertilizers, pesticides, trash/debris and oxygen-demanding substances.[10] This runoff can flow directly into storm drains and continue through pipes until it is released, untreated, into a local waterway and eventually the ocean. Untreated stormwater runoff degrades water quality in surface waters and groundwater and can affect drinking water, human health, and plant and animal habitats. As discussed below, the Project would include various design features and would implement BMPs to ensure that impacts to water quality impacts are less than significant

A Conceptual WQMP has been prepared for the Project for purposes of this CEQA analysis to identify appropriate stormwater BMPs and water quality management practices to be implemented during operation of the project. Since the Project is defined as a Priority Project, the WQMP includes both source control and treatment control BMPs, as well as site design BMPs, and would implement LID principles, where applicable and feasible. A Final WQMP, subject to approval by the County, would update the Project's Conceptual WQMP based on the Project's final design and would include the design features and BMPs identified in the Conceptual WQMP. The Project's operational BMPs listed under the Project Design Features section above would be consistent with applicable Municipal NPDES Permit and County LIP requirements to ensure less than significant water quality impacts.

As detailed in the WQMP and in the discussion of Project Design Features above, the Project would include an on-site stormwater infiltration basin in Planning Area 2 that would function to contain and treat stormwater pollutants prior to leaving the site. The infiltration basin on the North Site would retain and percolate all collected stormwater. Contaminants and sedimentation would be removed from stormwater runoff by bioretention and as such, no pollutants would be carried off the site (refer to BMP-I1, BMP-BT1 and BMP-TC3). Surface water runoff would be contained within infiltration basins (BMP-I1) with detained solids to be retained in the basins after water has infiltrated into the soil (BMP-BT1 and BMP-TC3). Stormwater flows in the South Site would be treated in a Contech® Storm Filter (or approved equivalent) and Filterra Units (or approved equivalent stormwater unit) to remove contaminates and sediments prior to combining with offsite/untreated discharges (refer to BMP-BT2, BMP-BT3, BMP-TC1 and BMP-TC2). Before water leaves the project site, it would pass through a series of stormwater filters to remove sediments and contaminants (BMP-BT2, BMP-BT3, BMP-TC1, and BMP-TC2).

In addition, as detailed in the WQMP, the BMPs employed under the Project would also include a host of measures to prevent pollutants from entering stormwater flows in the first place. These include the non-structural and structural source control BMPs listed in the Project Design Features section above (BMPs N1, N2, N3, N4, N11, N14, N15, S1, S3, S4, and S5). The PDFs include installation of riprap aprons to minimize the potential for downstream erosion (PDF 8-2), as well as sediment basins to be located upstream of all proposed storm water conveyance systems within the project site (PDF 8-3). The Project requires preparation of a SWPPP and both a conceptual and design level WQMP as per PDF 8-1 to prevent contamination of surface waters during project construction and operation.

[10] *When discharged to surface water, biodegradable material is decomposed by aquatic bacteria and other microorganisms. During this process, dissolved oxygen is consumed, reducing the amount available for aquatic animals. Severe depressions in dissolved oxygen levels can kill fish.*

Compliance with applicable regulatory requirements, as well as implementation of the PDFs and BMPs identified in the WQMP, would ensure that operation of the Project would not significantly affect the beneficial uses of the receiving waters or result in a violation of water quality standards, and would minimize the potential for contributing additional sources of polluted runoff. Thus, water quality impacts would be less than significant.

DRAINAGE PATTERNS AND STORMWATER DRAINAGE SYSTEM

Threshold	Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off-site?
Threshold	Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount or surface runoff in a manner which would result in flooding on or off-site?
Threshold	Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

4.8-2 The Project would be designed to maintain existing drainage patterns of the site and area. Post development runoff would be consistent with applicable regulatory requirements such that the post-project site would not result in significant hydrology impacts downstream such that flooding or erosion would occur on- or off-site. Furthermore, the Project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage. Compliance with applicable regulatory requirements and implementation of the project design features would ensure impacts regarding changes in drainage patterns and stormwater flows are less than significant.

As detailed in the Drainage Study for the Project, runoff from the developed areas of the project site would be collected in a drainage system within planned local streets and routed through onsite water quality BMPs prior to draining to the existing discharge locations. All developed runoff would be treated in full compliance with regional storm water quality regulations prior to mixing with natural, offsite flows. As discussed in the methodology section above, peak flow determinations were obtained from the Unit Hydrograph Method for Catchment Runoff Hydrographs. Please refer to the Drainage Study in Appendix H of this EIR for further details on the Unit Hydrograph Method for Catchment Runoff Hydrographs. The drainage system proposed for the Project to accommodate post-development surface flows is described below

Offsite runoff tributary to the North Site would be intercepted by two proposed storm drain systems. Runoff from the northern tributary area would be intercepted by a proposed headwall located to the north of Aspen Way. The flows would then be conveyed through the project site, draining to the natural existing flow path located within the project site. Flows generated by the natural tributary area to the northeast of the project site would be intercepted by a proposed headwall located at the northern end of the proposed "F" Street. These flows would then be conveyed via storm drain in a southerly direction, converging with flows from the

Aspen Way tributary flows. In the South Site, runoff generated by the Wire Springs Canyon tributary (Creek A) would be intercepted via a proposed headwall located at the eastern end of the proposed "B" Street within the South Site. These flows would be conveyed in a westerly direction via storm drain, ultimately discharging to the existing 8-foot x 7-foot box culvert located within Stonehaven Drive to the south of the project site.[11]

Table 4.8-3, *Developed Conditions (North Site): 2-Year and 100-Year Peak Flows – Western Boundary,* and **Table 4.8-4**, *Developed Conditions (South Site): 2-Year and 100-Year Peak Flows – Southern Boundary*, summarize the developed conditions peak flows at the western and southern boundaries of the project site, respectively. Figure 4.8-1 illustrates the locations of the western and southern project site boundaries, the locations of which would be same under existing and post-project conditions.

Table 4.8-3

Developed Conditions (North Site): 2-Year and 100-Year Peak Flows – Western Boundary

Discharge Location	Drainage Area (Ac)	2-Year Peak Flow (cfs)	Increase Over Existing Conditions (cfs)	100-Year Peak Flow (cfs)	Increase Over Existing Conditions (cfs)
Creek B	224	131.1	0.1	459.4	0.20
Creek C	717	328.0	0.0	1,235.3	0.01
Creek D	473	275.6	0.0	968.1	0.00
Total: Confluence of Creeks B, C, & D	**1,414**[a]	**647.2**[b]	**0.1**	**2,426.1**[b]	**0.21**

Ac = acres; cfs = cubic feet per second.

[a] *In order to provide the peak flow at the confluence of Creeks B, C, and D at the Western Boundary, a single design storm was created for use in all three creeks by using correction factors based on the total area of the Creeks B, C, and D.*

[b] *Peak flow for the confluence of Creeks B, C, & D is not equal to the sum of the individual peak flows for each creek as the peak flow in the hydrograph of Creek C occurs five minutes after the peak flows in Creeks B and D. Consequently, the peak discharge at the confluence is approximately 90 cfs and 200 cfs lower than the total sum of the partial peak flows for the 2-year peak flow and 100-year peak flow, respectively.*

Source: CEQA Drainage Study for Cielo Vista, prepared by Tory R. Walker Engineering, Inc., August 9, 2013; and Technical Memorandum Summary of Unit Hydrograph Analysis for Hydromodification Compliance of Cielo Vista, Yorba Linda, CA, prepared by Tory R. Walker Engineering, Inc. April 9, 2013.

As shown in Tables 4.8-3 and 4.8-4, the development of the project site would have has a negligible effect on the peak flows of all four creeks. The largest peak flow increase is 0.5 cfs and 0.7 cfs in Creek A for 2-Year peak flow and 100-year peak flow, respectively. These largest flow increases represent approximately 0.2% and 0.06% of the 2-year and 100 year peak flows (cfs), respectively. Such increases would not be visible or otherwise perceptible to the casual observer or residents in surrounding areas. The minimal increase in peak flow is attributable to two factors: (1) the area being developed is relatively small when compared to the size of each catchment and (2) the infiltration capacity of each catchment has already been greatly exceeded during the peak of the storm which makes the addition of impervious area somewhat irrelevant.

[11] *The drainage (or "creek") names (i.e., A, B, C, D) in this section are based on the Preliminary WQMP and Drainage Study prepared for the Project. The drainage names differ from those described in Section 4.3, Biological Resources, which are based on a separate report: Investigation of Jurisdictional Waters and Wetlands, Cielo Vista Project Site, Orange County, California, prepared by PCR in July 2012.*

Table 4.8-4

Developed Conditions (South Site): 2-Year and 100-Year Peak Flows – Southern Boundary

Discharge Location	Drainage Area (Ac)	2-Year Peak Flow (cfs)	Increase Over Existing Conditions (cfs)	100-Year Peak Flow (cfs)	Increase Over Existing Conditions (cfs)
Creek A	**674**[a]	**297.1**	**0.5**	**1,126.0**	**0.69**

Ac = acres; cfs = cubic feet per second.

[a] *A separate design storm was created for Creek A as no confluence analysis was required for this creek at the Southern Boundary.*

Source: CEQA Drainage Study for Cielo Vista, prepared by Tory R. Walker Engineering, Inc., August 9, 2013; and Technical Memorandum Summary of Unit Hydrograph Analysis for Hydromodification Compliance of Cielo Vista, Yorba Linda, CA, prepared by Tory R. Walker Engineering, Inc. April 9, 2013.

Thus, while there would be slight increase in total runoff volume compared to existing conditions, the Project's impact on the maximum peak flows of the hydrographs for all creeks would be minimal.[12]

According to the hydraulic analysis as part of the Drainage Study, the existing 8-foot x 7-foot box culvert within Stonehaven Drive has sufficient capacity to convey the marginal 0.7 cfs increase in the developed condition peak flow with no risk of downstream flooding at the Southern Boundary. As the velocity of the water in the box culvert is approximately 22.5 feet per second (ft/s), standard engineering practices and design would ensure that the appropriate entrance conditions are designed to ensure that such inlet control conditions are properly conveyed inside the culvert. Similarly, the increase of 0.7 cfs at the Western Boundary of the project site is an insignificant increase in peak flow. Overall, off-site hydrology/drainage impacts would be less than significant.

Despite the negligible increase in flows at the southern and western site boundaries, the Drainage Study indicates that to minimize peak flows at the Western and Southern Boundaries, the receiving storm drain within the project site (the headwall intercepts proposed at the end of "B" and "F" Streets) could be downsized by a 6-inch reduction in capacity. This has been included as PDF 8-4. The small reduction in storm flow conveyance would reduce the peak flow by throttling down flow, effectively detaining peak flows by the use of a hydraulic reduction. The ponding caused by such hydraulic reduction in capacity would be maintained on the project site in detention basins, ensuring that no offsite property is impacted by attenuating the peak flow (BMP-HM1 and PDF 8-4)). Appendix 4 of the Drainage Study includes illustrations of potential on-site detention basin locations. In addition, all developed pad elevations would be constructed at a minimum of 3-foot (or greater) above the anticipated peak water surface elevation to ensure that no residential structure would be flooded within the project site (PDF 8-5).

With respect to erosion under operational conditions, PDFs and BMPs required under the SWPPP, WQMP, and ESCP, would be implemented to ensure that the Project does not significantly increase erosion from the site. In addition to these measures, on-site soils would be stabilized with either established existing native vegetation, structures/paving materials, or landscaping, which would minimize the potential for substantial on-site erosion to occur. On hillsides, established native vegetation would be retained where practical, and

[12] C*EQA Drainage Study for Cielo Vista, prepared by Tory R. Walker Engineering, Inc., August 9, 2013.*

native vegetation would be seeded on manufactured hillsides. Moreover, in accordance with BMP-S12, on-site hillsides would be regularly inspected for visible soil erosion, and bare areas would be revegetated and stabilized until a root system is firmly established. Further, a HOA would be formed to own and maintain the open space lands proposed, as well as any infrastructure that would not be accepted by the public agencies. While off-site would only nominally increase as described above, the Project would include riprap aprons or other types of energy dissipaters located at all points of concentrated discharge where flow velocity exceeds five ft/s to mitigate the outlet velocity so as to minimize the potential for downstream erosion (PDF 8-2). Points of discharge would not be limited to storm drain outlets but would also include brow ditches and other forms of storm water conveyance. Riprap aprons typically reduce velocities to below five ft/s or less, which are considered to be non-erosive. Riprap aprons spread the flow, helping to transition to the natural drainageway or to sheet flow where no natural drainageway exists. Riprap aprons would be designed and sized in conformance with regional sizing criteria found in the "County of Orange Local Drainage Manual", dated August 2005. Please refer to the analysis included under Impact Statement 4.8-1 for a further discussion of operational water quality impacts. In addition, as discussed under Impact Statement 4.8-1, construction activities associated with the Project would result in less than significant water quality impacts, including erosion-related impacts.

Given that the Project would be designed to maintain existing drainage patterns and post development runoff volume would not significantly exceed the pre-development condition, the post-project site would not result in significant hydrology impacts downstream such that flooding or erosion would occur on- or off-site. Furthermore, the Project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage.[13]

Overall, based on the above, with implementation of the applicable PDFs compliance with applicable regulatory requirements, impacts regarding changes in drainage patterns and stormwater flows would be less than significant.

GROUNDWATER SUPPLIES

Threshold	Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

4.8-3 The Project would be served by a municipal water supply. The additional impervious surfaces created by the Project would not result in a substantial change in groundwater infiltration rates. Furthermore, there would be no noticeable change in any aquifer volume or a lowering of the local groundwater table due to a change in groundwater recharge rates as a result of Project implementation. Thus, the Project would have a less than significant impact with respect to groundwater supplies or groundwater recharge.

[13] *County of Orange/Santa Ana Region Priority Project Water Quality Management Plan: Cielo Vista Tentative Tract 17341, prepared by Charles Hartman & Associates in August 2012.*

As discussed in Section 4.15, *Utilities and Service Systems*, water for the project would be provided by Yorba Linda Water District (YLWD). No new water wells are proposed as part of the Project. As a result, the Project would not involve the extraction of groundwater from underlying resources at the site.

The Project would develop the 112 residential units and associated hardscapes (e.g., roadways, sidewalks, etc.), which would result in an increase in impervious surface area on-site. Specifically, 28.5 acres of the approximate 84-acre site would be improved with impervious surfaces. This reduction in pervious surface area could potentially reduce the amount of water reaching groundwater aquifers beneath the site.

As discussed above, soils investigations have determined that under existing conditions, stormwater on the North Site percolates into the underlying soils, while stormwater on the South Site flows into area drainage channels because soil conditions on the South Site are not conducive to percolation. To reduce the potential for impervious surfaces to impact groundwater infiltration rates, Project-related stormwater generated on the North Site (i.e., the incremental increase in sheet flow when compared to pre-project conditions) would flow to an infiltration basin which would allow stormwater to percolate into the underlying soil or evaporate into the atmosphere. Given the limited size of Planning Area 2 within the North Site, the corresponding limited extent of potential loss of groundwater recharge would not significantly impact groundwater supplies. In this respect, the infiltration rate on the North Site would not substantially change compared to existing conditions.

With respect to the South Site, soils investigations do not recommend the percolation of stormwater captured in the stormwater detention basins. Thus, the stormwater drainage system would be designed to retain project-related sheet flows until their flow rates mimic the pre-development conditions for a two year 24-hour storm. These flows would outlet to the 8 ft x 7 ft concrete box located in Stonehaven Drive. Therefore, although the Project would increase the surface area of impervious surfaces on the South Site, because stormwater flows do not substantially infiltrate to underlying soils under existing conditions, the additional impervious surfaces on the South Site would not result in a substantial change in groundwater infiltration rates. Furthermore, there would be no noticeable change in any aquifer volume or a lowering of the local groundwater table due to a change in groundwater recharge rates as a result of Project implementation.

Therefore, since the Project would not extract groundwater from the site or substantially interfere with groundwater recharge, less than significant impacts on groundwater supplies or groundwater hydrology would occur from Project implementation.

CONSISTENCY WITH COUNTY OF ORANGE AND CITY OF YORBA LINDA PLANS AND POLICIES

(1) County of Orange General Plan

The County's General Plan contains a goals and policies that are relevant to hydrology and water quality, which are presented in the General Plan Land Use Element and Resources Element. As discussed below in **Table 4.8-5**, *Project Consistency with Orange County General Plan*, the Project would be consistent with the applicable goals and policies of the County of Orange General Plan pertaining to hydrology and water quality.

Table 4.8-5

Project Consistency with Orange County General Plan

Goals, Objectives and Policies	Project Consistency
Land Use Element	
Policy 8 Enhancement of Environment. To guide development so that the quality of the physical environment is enhanced.	**Consistent.** The purpose of this policy is to ensure that all land use activities seek to enhance the physical environment, including the air, water, sound levels, landscape, and plant and animal life. This policy does not mean that environmental enhancement precludes development. It recognizes the need to improve both the manmade and natural environments. Where aspects of the natural environment are deemed to be truly significant, this policy requires measures be taken to preserve these aspects. Consistent with this policy, natural features would be preserved to the extent feasible within the permanent open space land use areas of the project site which include a main westerly draining course and canyon bisecting the project site. The Project would include 36.3 acres of permanent open space which would serve to preserve the natural, physical environment. In addition, the consolidation of oil production-related uses within the project site outside of available public views would further improve compatibility with adjacent residential areas. Also, run-off from the developed areas of the project site would be collected in a storm drainage system within local streets and routed through BMPs to be constructed as part of the Project (refer to the BMPs listed in the WQMP Features subsection above). The BMPs would serve to mitigate the increased flow anticipated from the increased impervious surface created with the development and would also decrease pollutants in the runoff. A final WQMP would be developed for implementation by the HOA, the entity owning and maintaining the water quality and drainage BMP features. The WQMP would provide guidelines to the HOA for the proper maintenance of the BMPs and water quality basin. The WQMP also identifies a host of other structural and non-structural BMPs to be implemented by the Project that would reduce pollution levels in stormwater discharge in compliance with applicable water quality standards. The Project's consistency with this policy is also addressed in Sections 4.1, *Aesthetics*, 4.2, *Air Quality*, and 4.3, *Biological Resources*.
Policy 13 Urban And Storm Runoff Regulations. The following policies establish a framework for the reduction of water pollution. The policies describe updated objectives for responding to current water pollution regulations referenced on page VI-56 of the Resources Element.	**Consistent.** Consistent with this policy, the Project would incorporate BMPs for erosion control, sediment control, storm water and non-storm water management, and waste management/pollution control as reflected earlier in this analysis. Implementation of these BMPs would ensure that the Project's site hydrology, runoff, and water quality comply with all required permits, County policies, and the

Table 4.8-5 (Continued)

Project Consistency with Orange County General Plan

Goals, Objectives and Policies	Project Consistency
Supplemental consideration for the Santa Ana Region Permit Establish a Condition of Approval to ensure that permanent water quality treatment BMPs are adequately constructed, operated and maintained throughout the life of the project.	Project's WQMP and SWPPP. The BMPs would include various structural, non-structural, treatment control, hydromodification and biotreatment BMPs. The Project would include water quality basins to provide treatment of Project flows within residential planning areas and attenuate peak flow discharge prior to flows entering the storm drain system. The water quality basins would serve to mitigate the increased flow anticipated from the increased impervious surface created with the development and would decrease pollutants in the runoff. The Final WQMP would include detailed sizing parameters for the basins and provide guidelines to the HOA, the responsible entity, for the proper maintenance of the water quality basins.
Resources Element	
Water Resources	
Policy 5 Water Quality. To protect water quality through management and enforcement efforts.	**Consistent.** A conceptual WQMP has been prepared for the Project. The Final WQMP would be reviewed and approved by the County as part of the Project Final Subdivision Map prior to receiving a grading permit for the Project. The Final WQMP would implement BMPs to comply with applicable existing regulations for eliminating or minimizing pollutants in stormwater runoff during construction and operation of the Project. The WQMP and associated BMPs developed in accordance with applicable regulations would constitute management and enforcements efforts consistent with Policy 5.

Source PCR Services Corporation, 2013.

(2) City of Yorba Linda General Plan

The City's General Plan contains goals and policies that are relevant hydrology and water quality in the General Plan Land Use Element and Safety Element. As discussed below in **Table 4.8-6**, *Project Consistency with Yorba Linda General Plan*, the Project would be potentially consistent with the applicable goals and policies of the City of Yorba Linda General Plan pertaining to hydrology and water quality. The notation of "Potentially Consistent" is in deference to the City's authority for making such determinations for projects located within the city limits.

Table 4.8-6

Project Consistency with Yorba Linda General Plan

Goals, Objectives and Policies	Project Consistency
Safety Element	
Goal 3 Protect the lives and property of residents and visitors of the City from flood hazards.	**Potentially Consistent.** The project site is not located within a designated 100-year flood plain and is not in an area subject to flooding.
Policy 3.1 Identify flood hazard areas and provide appropriate land use designations and regulations for areas subject to flooding.	
Policy 3.2 Maintain natural drainage courses and keep them free of obstructions.	**Potentially Consistent.** Stormwater flows would be directed to detention basins in Planning Areas 1 and 2, which would control flows on the project site and also allow debris and sedimentation to collect within the basins instead of flowing downstream along the drainage courses. One major drainage course in the 36 acre open space area would be retained in its natural state, with unaltered flows.
Land Use Element	
Goal 11 Ensure urban/stormwater runoff and water quality protection principles are properly considered in the land use decision-making process.	**Potentially Consistent.** The project would be subject to the preparation of a SWPPP to ensure that stormwater runoff is contained on site during construction through the use of water bars, silt fences, staked straw bales, and the like. Stormwater flow control during project operation would be defined by a WQMP which provides for the capture of stormwater flow(s) on the project site in order to reduce pollutant loads, including suspended solids, organic compounds, pesticides, and the like, as discussed under Impact Statement 4.8-1 above.
Policy 11.1 Limit disturbance of natural water bodies and drainage systems; conserve natural areas; protect slopes and channels; and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies.	**Potentially Consistent.** Within Planning Area 2, Creek C is planned for minor realignment to the east and would follow the base of a slope, part of the development of the residential lots. Otherwise drainage patterns would be maintained with onsite flows still collecting at the confluence of Creeks B, C and D before exiting the project site to the west. For Planning Area 1, stormwater flows would be discharged into an existing concrete box located in Stonehaven Drive. Within the open space area, the natural on site drainage would not be altered and would maintain existing flow patterns.
Policy 11.2 Minimize changes in hydrology and pollutant loading; require incorporation of controls, including structural and non-structural BMPs, to mitigate the projected increases in pollutant loads and flows; ensure that post-development runoff rates and velocities from a site have no significant adverse impact on downstream erosion and stream habitat; minimize the quantity of stormwater directed to impermeable surfaces and the MS4s (storm drain system); and maximize the percentage of permeable surfaces to allow more percolation of stormwater into the ground.	**Potentially Consistent.** After development, the project site would retain substantial permeable areas on individual lots, with the exception of street and driveway surfaces. Street flows and drainage in Planning Area 2 would be collected in a single detention basin where the water would percolate into the soil or evaporate. Within Planning Area 1, stormwater flows would be discharged into an existing concrete box located in Stonehaven Drive.

Table 4.8-6 (Continued)

Project Consistency with Yorba Linda General Plan

Goals, Objectives and Policies	Project Consistency
Policy 11.5 Provide for appropriate permanent measures to reduce stormwater pollutant loads in stormwater from the development site.	**Potentially Consistent.** Stormwater flow control during project operation would be defined by a WQMP which provides for the capture of stormwater flow(s) on the project site and other features (filters, detention, etc.) in order to reduce pollutant loads, including suspended solids, organic compounds, pesticides, and the like.

Source PCR Services Corporation, 2013.

3. CUMULATIVE IMPACTS

4.8-4 The Project combined with the related projects would not impact downstream hydrology or runoff water quality in the vicinity of the project area. Thus, cumulative hydrology and water quality impacts would be less than significant.

As indicated in the analysis above, consistent with applicable regulatory requirements, the Project would implement an on-site detention system to ensure that post development runoff volume for the two year frequency storm does not exceed that of the pre-development condition by more than five percent, and the time of concentration for the post development runoff for the two year storm event is not less than that for the pre-development condition by more than five percent. As such, the Project would not have the potential to result in cumulative off-site downstream hydrology impacts. Also, the PDFs and BMPs prescribed in the Project WQMP would remove and/or prevent pollutants from substantially degrading the water quality of runoff from the project site, thereby, minimizing the potential for cumulative water quality impacts. As indicated in Section 3.0 of this EIR, there are 18 related projects in the project area. However, this cumulative hydrology analysis focuses on Related Project No. 1 (Esperanza Hills), which would be located to the east of the project site as this is the only project located upstream of the site (see Figure 4.8-1). Similar to the Project, per applicable regulatory requirements, Related Project No. 1 would be required to ensure that it does not increase flows or alter the drainage pattern such that substantial erosion or flooding would not occur on- and off-site. As part of the site-specific hydrology analysis for the Esperanza Hills project, runoff quantities would also need to be within the capacity of the storm drain system serving that site and if not, appropriate infrastructure upgrades would need to be provided by that Project. As Esperanza Hills would be required to comply with the same hydrology-related regulatory requirements as the Project, the cumulative impact of these projects on downstream drainage facilities, flooding and erosion would be less than significant. The other related projects are not located within the watershed boundary that is upstream of the project site. Project-by-project analysis, including Esperanza Hills, of water quality impacts and compliance with State and County regulatory requirements, including NPDES Construction General Permit, Municipal NPDES Permit and County LIP requirements, where applicable, would ensure that potentially significant cumulative impacts regarding water quality would be reduced to a less than significant level.

4. REFERENCES

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