2.8. Hydrology and Water Quality

This section addresses potential hydrology and water quality impacts that may result from construction and/or operation of the Safari Highlands Ranch (SHR) project. The following discussion addresses the existing hydrology and water quality conditions of the affected environment, evaluates the SHR project's consistency with applicable goals and policies, identifies and analyzes environmental impacts, and recommends measures to reduce or avoid adverse impacts anticipated from implementation of the project, as applicable.

The analysis in this section is largely based on the Drainage Study (Hunsaker & Associates 2017) and the Priority Development Project Storm Water Quality Management Plan (SWQMP) (Hunsaker & Associates 2017). These reports have been reviewed by City Engineering and Utilities staff as well as by Michael Baker International in 2017. The reports are included in their entirety in **Appendices 2.8-1** and **2.8-2**, respectively.

It should be noted that, because there is no detailed design for the proposed fire station improvements at this time, a site-specific drainage study and SWQMP will be prepared at a later date when such details are available. However, assumptions for impervious area relative to the fire station improvements were made in the modeling in the technical reports to ensure that such improvements were analyzed for California Environmental Quality Act (CEQA) purposes. The future drainage study and SWQMP prepared for the fire station improvements will be required to demonstrate that such improvements conform to the assumptions made in the technical analyses referenced above.

The table below summarizes hydrology and water quality impacts detailed in **Section 2.8.4**.

Summary of Hydrology and Water Quality Impacts

Threshold Number	Issue	Determination	Mitigation Measures	Impact After Mitigation
1	Water Quality Standards and Requirements	Less than Significant Impact	None required	Less than Significant Impact
2	Groundwater Supplies and Recharge	Less than Significant Impact	None required	Less than Significant Impact
3	Erosion or Siltation	Less than Significant Impact	None required	Less than Significant Impact
4	Flooding	Less than Significant Impact	None required	Less than Significant Impact
5	Exceed Capacity of Storm Water Systems	Less than Significant Impact	None required	Less than Significant Impact
6	Otherwise Substantially Degrade Water Quality	Less than Significant Impact	None required	Less than Significant Impact
7	Housing within a 100-Year Flood Hazard Area	No Impact	None required	No Impact
8	Structures within a 100-Year Flood Hazard Area	No Impact	None required	No Impact

Summary of Hydrology and Water Quality Impacts, continued

Threshold Number	Issue	Determination	Mitigation Measures	Impact After Mitigation
9	Dam Inundation and Flood Hazards	No Impact	None required	No Impact
10	Seiche, Tsunami, and Mudflow Hazards	Less than Significant Impact	None required	Less than Significant Impact

2.8.1. Existing Conditions

On-site elevations range from approximately 400 feet above mean sea level (amsl) in the southwest corner to approximately 1,800 feet amsl in the northeast portion of the property. Topographic features consist of rugged, steeply sloping hillsides intermixed with occasional, relatively level valleys.

The project area experiences a Mediterranean-type climate, with a rainy winter season followed by a hot, dry summer. Spring and fall months tend to be mild in temperature with variable rainfall.

The project site lies within the San Dieguito watershed (905.32 San Dieguito Hydrologic Unit). A ridgeline extends across the project site from the eastern project boundary and divides the property into two drainage areas, referred to as Drainage Area A (the north) and Drainage Area B (the south). The two drainage areas flow across the site in a northeast to southwest direction (see **Figure 2.8-1**).

Under existing conditions, Drainage Area A consists of approximately 412 acres in the northern portion of the site. The summit of the drainage area is located just north of the project boundary at an elevation of approximately 1,765 feet amsl. Runoff is then conveyed southwesterly via a series of natural valleys that converge and eventually cross the western project boundary approximately 3,000 feet south of the northern boundary. Runoff then continues southwesterly across undeveloped terrain and natural valleys located just east of Rosewood Lane (a residential cul-de-sac in the Eagle Crest Golf Course/Rancho San Pasqual development). This drainage course continues southwest and crosses under Old Ranch Road through an existing culvert, discharging to the west in the golf course. Runoff is then conveyed southwest through the golf course, crosses under Rockwood Road west of San Pasqual Union School, and continues south, joining the San Dieguito River.

Under existing conditions, Drainage Area B comprises approximately 1,925 acres. The summit of the drainage area is located at an estimated 4,700 feet northeast of the project boundary at an elevation of approximately 1,880 feet amsl. Runoff from this off-site area is conveyed southwesterly through a series of natural valleys and discharges at the southern end of the project site through three 10-foot by 8-foot box culverts under Rockwood Road between the Eagle Crest Golf Course/Rancho San Pasqual development and the Rancho Vistamonte development. Drainage Area B then joins Drainage Area A after flowing past San Pasqual Union School.

According to available Federal Emergency Management Act (FEMA) Flood Insurance Rate Maps (FIRM), the project is located within two federal FIRM panels (06073C1101G and 06073C0850G). FIRM panel 06073C0850G shows the project site in an unshaded Zone X,

which is defined as "Areas determined to be outside the 500-year floodplain." FIRM panel 06073C1101G is an unprinted map. According to FEMA, an unprinted map indicates that no physical FIRM panel was printed for this area and typically FEMA uses the non-printed panel designation when the area is entirely located within a single flood zone. As the surrounding panels show Zone X, it can be assumed that this portion, as well as the entire project site, is located in the unshaded Zone X.

2.8.2. Regulatory Framework

Federal

Clean Water Act

The Clean Water Act (CWA) gives individual states the primary responsibility for protecting and restoring water quality. In California, the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) are the agencies with the primary responsibility for implementing federal CWA requirements, including developing and implementing programs to achieve water quality standards. Water quality standards include designated beneficial uses of water bodies, criteria or objectives (numeric or narrative) which are protective of those beneficial uses, and policies to limit the degradation of water bodies. The project is located in an area of the state regulated by the San Diego RWQCB. Water quality standards for water bodies in the region are primarily contained in the Water Quality Control Plan for the San Diego Basin (Basin Plan), last updated in 2016 (RWQCB 2016), which is discussed in more detail below.

Sections 401 and 404 of the CWA

CWA Sections 401 and 404 are administered through the regulatory program of the US Army Corps of Engineers (USACE) and regulate the water quality of all discharges of fill or dredged material into waters of the United States, including wetlands and intermittent stream channels. Section 401 sets forth water quality certification requirements for any applicant applying for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities that may result in any discharge into the navigable waters.

Section 404, in part, authorizes the USACE to:

- Set requirements and standards pertaining to such discharges: subparagraph (e);
- Issue permits "for the discharge of dredged or fill material into the navigable waters at specified disposal sites:" subparagraph (a);
- Specify the disposal sites for such permits: subparagraph (b);
- Deny or restrict the use of specified disposal sites if "the discharge of such materials into such area would have an unacceptable, adverse effect on municipal water supplies and fishery areas:" subparagraph (c);
- Specify type of and conditions for non-prohibited discharges: subparagraph (f);
- Provide for individual state or interstate compact administration of general permit programs: subparagraphs (g), (h), and (j);

- Withdraw approval of such state or interstate permit programs: subparagraph (i);
- Ensure public availability of permits and permit applications: subparagraph (o);
- Exempt certain federal or state projects from regulation under this section: subparagraph (r); and
- Determine conditions and penalties for violation of permit conditions or limitations: subparagraph (s).

National Pollutant Discharge Elimination System

As authorized by CWA Section 402(p), the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. In California, the State Water Resources Control Board issues NPDES permits to cities and counties through the various RWQCBs. It is the responsibility of the RWQCBs to preserve and enhance the quality of the state's waters through the development of water quality control plans and the issuance of waste discharge requirements. Waste discharge requirements for discharges to surface waters also serve as NPDES permits.

State

California Environmental Quality Act

The California Environmental Quality Act (CEQA) and its implementing guidelines (CEQA Guidelines) serve as the primary environmental legislation in California relative to the evaluation of environmental impacts. CEQA requires that projects having the potential to adversely affect the environment be subject to environmental review. If found to be significant, such environmental impacts are typically mitigated based upon the findings of the environmental review process and in conformance with applicable laws and regulations.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, in cooperation with the CWA, established the State Water Resources Control Board. The SWRCB and the nine RWQCBs are responsible for protecting California's surface waters and groundwater supplies. The act establishes Water Quality Control Plans (Basin Plans) for each of the nine regions overseen by the RWQCBs that designate the beneficial uses of California's rivers and groundwater basins.

The Water Quality Control Plan for the San Diego Basin directs the beneficial uses of state waters in Region 9, describes the water quality that must be maintained to support such uses, and includes programs, projects, and other actions necessary to achieve the standards established in the Basin Plan. The San Diego RWQCB implements the Basin Plan by issuing and enforcing waste discharge requirements to individuals, communities, or businesses whose waste discharges may affect water quality. These requirements are state waste discharge requirements for discharge to land or federally delegated NPDES permits for discharges to surface water. CWA Sections 401–402 and Section 303(d) are also implemented through the Porter-Cologne Water Quality Control Act.

State Water Resources Control Board, Storm Water General Construction Permit

The NPDES was established per 1972 amendments to the federal Water Pollution Control Act [now called the Clean Water Act] in order to control discharges of pollutants from point sources (Section 402). Amendments made to the CWA created a new section of the act devoted to storm water permitting (Section 402[p]), with individual states designated for administration and enforcement of the provisions of the CWA and the NPDES permit program. The SWRCB issues both General Construction Permits and individual permits under this program.

The NPDES General Construction Storm Water Permit, Water Quality Order 2009-0009-DWQ, contains requirements for post-construction storm water management. The project must include the implementation of long-term best management practices (BMPs) to address post-construction storm water, particularly for impervious surface runoff, access road alignments, and proposed drainage crossings.

Projects disturbing more than 1 acre of land during construction are required to file a Notice of Intent (NOI) with the SWRCB to be covered under the state's NPDES General Construction Permit for discharges of storm water associated with construction activity. A project proponent must implement control measures that are consistent with the State General Permit. A storm water pollution prevention plan (SWPPP) must be developed and implemented for each site covered by the General Permit.

A SWPPP describes best management practices the discharger would use to protect storm water runoff and reduce potential impacts to surface water quality through the construction period. The SWPPP must contain the following: a visual monitoring program, a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

The area that would be disturbed with the project exceeds 1 acre. Therefore, the project would be required to comply with the General Permit. Further, 303(d) impaired water bodies downstream of the project site include San Dieguito Lagoon, Cloverdale Creek, and the San Dieguito River (Hunsaker & Associates 2017, page 12).

Local

City of Escondido Jurisdictional Urban Runoff Management Program

The City's Jurisdictional Runoff Management Program (JRMP) was developed in compliance with the requirements of San Diego Regional Water Quality Control Board Order Number R9-2013-0001. In November 2015, the permit was amended by Order R9-2015-0100. The permit is intended to manage storm water discharges from Phase I municipal separate storm sewer systems (MS4s) in the San Diego region, which comprises San Diego, Orange, and Riverside County co-permittees.

The MS4 Permit was adopted on May 8, 2013, replacing the 2007 Municipal Storm Water Permit (R9-2007-0001). All 21 municipal agencies in San Diego County, including the City of Escondido, are subject to the MS4 Permit requirements, and all jurisdictions are required to develop both jurisdictional (JRMP) and watershed-scale plans (Water Quality Improvement

Plans, or WQIPs) that identify how they will comply with the requirements. WQIPs are prepared through the coordination of multiple jurisdictions and are in support of the JRMP, while the City's JRMP is applicable only to the City of Escondido. The JRMP identifies how the City will implement the Water Quality Improvement Plan. The WQIP identifies strategies aimed at achieving the highest priority water quality conditions in certain areas of the City as well as baseline strategies required by the MS4 Permit.

City of Escondido Storm Water Design Manual (BMP Design Manual)

As required by the MS4 Permit, the Model Best Management Practices (BMP) Design Manual went into effect in February 2016 and replaced the Countywide Model Standard Urban Storm Water Mitigation Plan, dated March 25, 2011, which was based on the requirements of the 2007 MS4 Permit.

The manual identifies source control, site design, and structural BMPs, as well as BMPs for hydromodification management, and provides specific post-construction storm water requirements for standard projects and priority development projects, as well as procedures for planning, preliminary design, selection, and design of permanent storm water BMPs, based on performance standards identified in the MS4 Permit. The manual serves as the basis for the City's storm water BMP design for public and private development projects, preparers of SWQMPs, and co-permittee reviewers of SWQMPs.

City of Escondido Floodplain Overlay Zone

The City's Floodplain Overlay Zone regulates land uses located in areas subject to flood hazards due to designated floodplains of rivers, creeks, streams, and water courses. The overlay zone is intended to protect public health, safety, and welfare and to reduce the potential for loss of property or life as the result of flooding and/or inundation. The overlay zone restricts land uses that pose risk to human health, safety, and/or property in flooding events or that would substantially increase flood levels or flow rates; requires protection against flood damage at initial construction for those land uses susceptible to flood events, including public facilities that serve such uses; and protects individuals from buying lands that are considered unsuitable due to potential flood hazards.

City of Escondido Dam Emergency Action Plans

The City's Public Works Department is responsible for implementation of the Lake Dixon Lake and Lake Wohlford Dam Emergency Action Plans. These plans provide guidance in the event that evacuation is necessary in the event of potential or actual dam failure. Such an event may lead to the significant loss of life, property damage, and/or displacement of residents. The plans evaluate the existing setting, identify downstream entities potentially affected, establish official routes for evacuation, and outline proper event responses. Inundation maps indicate the direction of water flow, inundation area boundaries, facilities that would house evacuees (e.g., hospitals, schools, multipurpose staging areas, mass care and shelter facilities), and designated command posts and sites.

City of Escondido Zoning Code

Article 55, Grading and Erosion Control, of the City's Zoning Code (Municipal Code Chapter 33) provides measures to guide land modification activities in order to protect the overall natural and topographic character and the visual integrity of hillsides and ridgelines, unique geologic/geographic features, and public health, safety, and welfare. The ordinance regulates excavation and grading on private and public property and identifies design standards to protect water quality and reduce the potential for erosion to occur during project construction. The ordinance also provides guidance for plan approval and for inspection of grading post-construction to ensure conformance with state and local storm water regulations.

City of Escondido Municipal Code

Procedures for floodplain management are addressed in the City's Municipal Code in Article 19 of Chapter 6. Article 19 provides measures to regulate or prohibit uses that pose a threat to health, safety, and property from water or erosion hazards or that may result in substantial increases in potential erosion, flood levels, or velocity or storm water flows. The article requires use of construction methods to reduce the risk of damage for those land uses susceptible to flooding events and includes regulations to control filling, grading, and dredging activities; to restrict development that may substantially increase the potential for flood damage to occur; and to control the construction of barriers that may divert floodwaters or result in increased flood hazards.

Municipal Code Chapter 22, Wastewaters, Storm Waters, and Related Matters, cites the City's regulations pertaining to the management of storm water for purposes of maintaining storm water quality over the long term through the prevention, elimination, or reduction of pollutants in urban storm water discharges to the maximum extent practicable. Chapter 22 identifies measures to prohibit discharges into the storm water conveyance system (with the exception of storm water) and to restrict illegal connection to the City's storm water drainage system. Measures aimed at controlling the potential for non-storm water discharges (e.g., spills, dumping, or disposal of substances) from entering the City's storm water conveyance system are identified. The chapter addresses discharge control, protection of beneficial waters, sewage disposal systems on privately held lands, sewer connection fees and service charges, connection laterals, and industrial wastewaters.

City of Escondido Hydromodification Management Plan

The City of Escondido HMP, adopted January 2011, guides decision-making and the selection of design features intended to mitigate critical shear stress that causes loss of bed and bank materials through channel incision and widening (e.g., bank erosion) and to protect watercourse stability, while maintaining healthy riverine morphology. San Diego RWQCB Order No. R9-2013-0001requires that the HMP manage increases in runoff discharge rates and durations from all Priority Development Projects, where such increased rates and durations are likely to cause increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

The HMP provides design standards to control flows within the geomorphically significant flow range (a range of flows that are capable of creating unstable bed and bank conditions).

The City's HMP is based on the Final County Model HMP approved by the San Diego RWQCB, but has been modified to address conditions specific to Escondido and the City's development planning process.

City of Escondido General Plan

The General Plan includes the Resource Conservation Element. This element includes a number of goals and policies that address maintaining water resources and storm water quality within the City and minimizing potential effects of water quality degradation on downstream water bodies. The following goals and policies are pertinent to the SHR project:

GOAL 6: Preservation and protection of the City's surface water and groundwater quality and resources.

Water Resources and Quality Policy 6.2

Protect the surface water resources in the city including Lake Wohlford, Dixon Lake, Lake Hodges, Escondido Creek, and other waterways.

Water Resources and Quality Policy 6.3

Protect the sustainability of groundwater resources.

Water Resources and Quality Policy 6.4

Require new development to preserve areas that provide opportunities for groundwater recharge (i.e., areas where substantial surface water infiltrates into the groundwater), storm water management, and water quality benefits.

Water Resources and Quality Policy 6.5

Maintain natural and improved drainages as permanent open space.

Water Resources and Quality Policy 6.6

Control encroachments into wetlands and designated floodways to protect the community's water resources.

Water Resources and Quality Policy 6.8

Maintain Escondido's natural creek system in an undisturbed state with a minimum of a 50-foot buffer and setback for development, or as established by appropriate wildlife agencies, unless stream course alteration, channelization, and/or improvements are approved by necessary state and federal agencies and the City.

Water Resources and Quality Policy 6.9

Conserve and restore creeks to their natural states whenever possible, and allow areas where channelization has occurred for flood control purposes to serve as urban open space.

Water Resources and Quality Policy 6.10

Require that drainage channels be designed to accommodate riparian vegetation growth.

Water Resources and Quality Policy 6.11

Allow public access to the creeks with that will not impact habitat areas, consistent with sound resource management practices.

Water Resources and Quality Policy 6.12

Regulate construction and operational activities through the use of storm water protection measures in accordance with the City's National Pollution Discharge Elimination System (NPDES) permit.

Water Resources and Quality Policy 6.14

Require new development to protect the quality of water resources and natural drainage systems through site design and use of source controls, storm water treatment, runoff reduction measures, best management practices, and Low Impact Development measures.

Water Resources and Quality Policy 6.15

Protect Escondido's shallow groundwater basin from contamination by regulating storm water collection and conveyance to ensure pollutants in runoff have been reduced to the maximum extent practicable.

Multi-Jurisdictional Hazard Mitigation Plan, San Diego County

In order to qualify for hazard mitigation funding, the federal Disaster Mitigation Act of 2000 requires all local governments to create a disaster plan. For San Diego County, the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) (2010) is a countywide plan that identifies risks and specific methods by which potential damage resulting from disasters can be minimized.

The MJHMP applies to 18 cities, the County of San Diego, and the Rancho Santa Fe Fire Protection District. The MJHMP serves as a comprehensive resource document aimed at enhancing public awareness, enabling coordination between multiple jurisdictions, providing decision-making tools, and enhancing local policies to address hazard mitigation capabilities. The MJHMP identifies hazards experienced in San Diego County (e.g., dam failure, seismic-related events, coastal storms/tsunamis, floods, man-made hazards) and discusses programs implemented to minimize or avoid such hazards. The MJHMP also considers the potential impact that climate change may have on the occurrence and intensity of natural hazards.

Construction General Permit

Storm water runoff at construction sites within the City's jurisdiction is subject to the requirements given in the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2010-0014-DWQ, NPDES No. CAS000002. Discharges of storm water associated with construction activity are authorized through the General Permit. All storm water dischargers are required to demonstrate conformance with all requirements, provisions, limitations, and prohibitions identified by the permit. For projects that disturb one or more acre of land surface, or are part of a common plan of development or sale that disturbs more than one acre of land surface, the General Permit authorizes discharges of pollutants in storm water to waters of the United States during the construction phase.

Municipal Storm Water Permit

To ensure the protection and enhancement of area creeks, the City of Escondido implements water quality improvement and runoff management measures in conformance with the San Diego RWQCB's Order No. R9-2013-0001 as amended (the Municipal Separate Storm Sewer Systems [MS4] Permit) (RWQCB 2017). The permit is intended to protect the quality of urban storm water runoff from the MS4s. The order requires jurisdictions within a watershed to prepare a Watershed Urban Runoff Management Program. The program's intent is to protect the overall quality and function of the watershed through storm water management techniques and design controls.

San Diego Basin Plan

Storm water quality in the San Diego Groundwater Basin is addressed by the San Diego RWQCB's Water Quality Plan for the San Diego Basin (1994; amended 2016), which identifies specific objectives for the protection of beneficial uses of water. The Basin Plan is intended to designate beneficial uses for surface water and groundwater resources, establish objectives for protection of beneficial uses and prevention of anti-degradation of water quality, identify effective mitigation measures for protection of beneficial uses of regional waters, and discuss monitoring activities to assess the effectiveness of the Basin Plan in achieving water quality.

City of Escondido Hydromodification Management Plan

Hydromodification refers to changes in the magnitude and frequency of river, creek, or stream flows that is caused by increasing urbanization. The City of Escondido Hydromodification Management Plan (HMP) was prepared to address the potential impacts of such hydromodification on watercourses that accept these flows, and therefore, can be affected by resulting erosion, sedimentation, or degradation of in-stream habitat. Channel or streambed stability is affected by several erosive forces that include: increases in driving force (shear stress); critical shear stress (e.g., the point at which erosion occurs); changes in the sediment delivery; and geomorphic condition.

The City of Escondido HMP is designed to provide guidance in decision making and design features that assist in mitigating critical shear stress that causes the loss of bed and bank materials. The HMP document is based on the Final County of San Diego Model HMP approved by the RWQCB and has been modified to address conditions specific to the City of Escondido and the City's development planning process. The HMP requirements identified have been incorporated into the City of Escondido Standard Urban Storm Water Mitigation Plan (SUSMP) via HMP criteria and municipal ordinances.

County of San Diego Hydromodification Management Plan

Per San Diego RWQCB Permit Order R9-2013-0001, co-permittees (representing San Diego County and the incorporated cities) are required to implement a HMP. Priority development projects are subject to the HMP, adopted in March 2011, which includes standards to control storm water runoff discharge rates and durations, minimize the potential for erosion and sedimentation, and/or reduce or avoid other potential impacts on downstream beneficial uses. The HMP requires that priority development projects identify and incorporate measures for

hydromodification to ensure that storm water runoff rates and durations do not exceed pre-development conditions or result in adverse erosion or sedimentation effects.

2.8.3. Thresholds for Determination of Significance

City of Escondido Environmental Quality Regulations (Zoning Code Article 47) and Appendix G of the CEQA Guidelines as amended contain analysis guidelines related to the assessment of hydrology and water quality. A project would result in a significant impact if it would:

1. Violate any water quality standards or waste discharge requirements.

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 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).

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/increased erosion or siltation on- or off-site.

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-site.

5. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

6. Otherwise substantially degrade water quality.

7. Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

8. Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

9. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

10. Inundation by seiche, tsunami, or mudflow.

2.8.4. Analysis of Project Effects and Determination of Significance

Threshold 1: Would the project violate any water quality standards or waste discharge requirements?

Storm water runoff (both dry and wet weather) generally discharges into storm drains and/or flows directly to creeks, rivers, lakes, and the ocean. Polluted runoff can have harmful effects on drinking water, recreational water, and wildlife. Storm water characteristics depend on site conditions (e.g., land use, impervious cover, pollution prevention, types and amounts of best management practices), rain events (duration, amount of rainfall, intensity, and time between events), soil type and particle sizes, multiple chemical conditions, the amount of vehicular traffic, and atmospheric deposition. Major pollutants typically found in runoff include sediments, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogens, and bacteria. The majority of storm water discharges are considered nonpoint sources and are regulated by a NPDES Municipal General Permit or Construction General Permit.

A net effect of development can be to increase pollutant export over naturally occurring conditions to adjacent streams and also on downstream receiving waters. However, an important consideration in evaluating storm water quality from a site is to assess whether it impairs the beneficial use of the receiving waters. Receiving waters can assimilate a limited quantity of various constituent elements, but there are thresholds beyond which the measured amount becomes a pollutant and results in an undesirable impact.

Short-Term Construction

Construction grading, excavation, and other construction activities associated with the project could impact water quality due to sheet erosion resulting from exposed soils and subsequent deposition of particles and pollutants in drainage areas. Construction has the potential to produce typical pollutants such as nutrients, heavy metals, pesticides/herbicides, toxic chemicals, oils and fuels, lubricants, and solvents. Additionally, waste materials such as wash water, paints, wood, paper, concrete, food containers, and sanitary wastes may be transported from the project site to nearby drainages, watersheds, and groundwater in storm water runoff, wash water, and dust control water. The significance of these water quality impacts would vary depending on the level of construction activity, weather conditions, soil conditions, and increased sedimentation of drainage systems in the area.

Construction controls to minimize water quality impacts are not necessarily the same measures used for long-term water quality management, as construction-related water quality control measures are temporary in nature and specific to the type of construction. Development would be subject to compliance with NPDES permit requirements and with Chapter 22, Wastewaters, Storm Waters, and Related Matters, of the City's Municipal Code, which regulates the management of storm water. The purpose of Chapter 22 is to effectively prevent non-storm water discharges into the City's storm water drainage system and to maintain existing water quality over the long term.

Prior to project grading or construction, preparation of a storm water pollution prevention plan (SWPPP) would be required. The SWPPP would include a series of specific best

management practices to be implemented during construction in order to address erosion, accidental spills, and the quality of storm water runoff. Best management practices that must be implemented as part of a SWPPP can be grouped into two major categories: erosion and sediment control BMPs, and non-storm water management and materials management BMPs.

Erosion controls include practices to stabilize soil, to protect the soil in its existing location, and to prevent soil particles from migrating. Examples of erosion control BMPs are preserving existing vegetation, mulching, and hydroseeding. Sediment controls are practices to collect soil particles after they have migrated, but before the sediment leaves the site. Examples of sediment control BMPs are street sweeping, fiber rolls, silt fencing, gravel bags, sand bags, storm drain inlet protection, sediment traps, and detention basins. Wind erosion controls prevent soil particles from leaving the site in the air. Examples of wind erosion control BMPs include applying water or other dust suppressants to exposed soils on the site. Tracking controls prevent sediment from being tracked off site via vehicles leaving the site to the extent practicable. A stabilized construction entrance not only limits the access points to the construction site but also functions to partially remove sediment from vehicles prior to leaving the site.

Non-storm water management and materials management controls reduce non-sediment-related pollutants from potentially leaving the construction site to the extent practicable. The Construction General Permit prohibits the discharge of materials other than storm water and authorized non-storm water discharges (such as irrigation and pipe flushing and testing). Non-storm water BMPs tend to be management practices with the purpose of preventing storm water from coming into contact with potential pollutants. Non-storm water BMPs include preventing illicit discharges and implementing good practices for vehicle and equipment maintenance, cleaning, and fueling operations, such as using drip pans under vehicles. Waste and materials management BMPs include implementing practices and procedures to prevent pollution from materials used on construction sites. Examples of materials management BMPs include:

- Good housekeeping activities such as storing of materials covered and elevated off the ground, in a central location.
- Securely locating portable toilets away from the storm drainage system and performing routine maintenance.
- Providing a central location for concrete washout and performing routine maintenance.
- Providing several dumpsters and trash cans throughout the construction site for litter/floatable management.
- Covering and/or containing stockpiled materials and overall good housekeeping on the site.

In addition, construction sites with 1 acre or greater of soil disturbance or less than 1 acre, but part of a greater common plan of development, are required to apply for coverage of discharges under the General Construction Permit. As part of project compliance, a Notice of Intent would need to be prepared and submitted to the San Diego RWQCB providing notification and intent to comply with the General Permit. The Construction General Permit

also requires that construction sites be inspected before and after storm events and every 24 hours during extended storm events. The purpose of the inspections is to identify maintenance requirements for the BMPs and to determine the effectiveness of the BMPs that are being implemented. Additional requirements include compliance with post-construction standards focusing on low impact development (LID) and preparation of rain event action plans.

Project Operation

The project would have the potential to result in long-term effects on runoff once development is complete. Runoff from disturbed areas would likely contain silt and debris, resulting in a long-term increase in the sediment load of the storm drain system serving the City. Substances such as oils, fuels, paints, and solvents may also be transported to nearby drainages, watersheds, and groundwater in storm water runoff and wash water. The significance of the effect on water quality would vary depending on weather conditions (e.g., amount of rainfall), soil type and characteristics, and increased sedimentation of drainage systems that may affect or restrict storm water flows in the area.

Consistent with requirements of the City of Escondido and County HMPs, the project, as a priority development project, is required to identify and incorporate measures for hydromodification to ensure that storm water runoff rates and durations do not exceed pre-development conditions or result in adverse erosion or sedimentation effects. All priority development projects are required to implement structural BMPs for storm water pollutant control. Additionally, projects subject to hydromodification management requirements must implement structural BMPs for flow control. Structural BMPs such as biofiltration and combined pollutant control and hydromodification control measures have been incorporated into the project design.

The pre- and post-development conditions for the project were evaluated to determine if the proposed biofiltration facilities have sufficient footprint to meet the current Hydromodification Management Plan requirements of the RWQCB. Hydromodification management would occur through storage of storm water in the proposed on-site basins, with outlets to regulate the flow rate and duration of storm water released. Runoff would be collected in storm drain inlets from street surfaces and routed toward multipurpose basins and treated for storm water quality, flow control for hydromodification, and flood attenuation to maintain existing peak flow rates during a 50-year storm event.

Runoff from natural and sloped areas containing no impervious areas would be collected in separate storm drains and discharged through riprap energy dissipaters to avoid comingling of drainage and to allow any course sediment generated in the areas to pass through. Where proposed roadways would cross major drainage channels, culvert undercrossings are proposed to maintain existing drainage patterns. For off-site improvements, to the south, Rockwood Road would be widened and "green streets" design elements incorporated to address water quality. A roadside swale is also proposed along the fire truck access for storm water treatment purposes. The proposed facilities have been designed to properly manage and retain on-site flows before such flows are transported off-site.

Based on the SWQMP (Hunsaker & Associates 2017; **Appendix 2.8-2**), the project site is tributary to the San Dieguito River. As indicated in the Drainage Study, through project design,

storm water runoff upon project completion would remain the same as under existing conditions and would drain to the same two points of discharge (see **Appendix 2.8-1**, page 3).

The SWQMP identifies a number of site design BMPs to ensure that water quality is maintained over the long-term. The following such BMPs have been incorporated into the project design:

- Maintain existing drainage patterns.
- Preserve trees.
- Avoid sensitive areas such as wetlands and waterways.
- Install parking and driving aisles to minimum widths required to meet standards.
- Avoid compaction in planned landscaped areas.
- Drain rooftops, roads, and sidewalks into adjacent landscape areas.
- Use small (runoff) collection strategies located at, or close to, the source.
- Landscape with native or drought tolerant species.

The SWQMP also identifies a series of specific non-structural and structural source control BMPs (or treatment control BMPs) to be incorporated into the project design to meet San Diego RWQCB requirements (see **Appendix 2.8-2**, pp. 17-18). The following source control BMPs are included in the project design:

- Provide storm drain system stenciling and signage.
- Direct irrigation away from impervious surfaces.
- Locate trash containers in a roofed, walled enclosure.
- Specific BMPs for use of on-site storm drain inlets and pools, spas, ponds, fountains, and other water features, as well as for plazas, sidewalks, and parking lots.

Preparation of and confluence with a SWPPP, implementation of best management practices identified in the SWQMP, and compliance with existing federal, state, and local regulations as discussed above would protect water quality and ensure project compliance with applicable water quality standards. The project would not violate any water quality standards or waste discharge requirements. Impacts would be **less than significant**.

Threshold 2: 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)?

Currently, the project site does not have a public water supply source, nor is it located within any water service district. Upon the property's annexation into the City, public water service would be provided by the City of Escondido (see also **Section 2.13, Utilities and Service**

Systems, which discusses water supply sources for the City and its Sphere of Influence). The City does not rely on groundwater sources for its water supply. Furthermore, project implementation would result in availability of a reclaimed water source to irrigate common areas on-site, thereby furthering groundwater recharge with outside sources. Therefore, the project would not adversely affect or deplete groundwater supplies due to water demand generated by the proposed development.

The project would require installation of new impervious surfaces that could increase runoff on the project site and may lead to a decrease in the amount of water recharged into the groundwater system within the project boundaries. To minimize the potential effects on groundwater recharge, the project has been designed to include pervious, landscaped areas, allowing groundwater recharge to continue to occur. Runoff from developed areas would drain into the proposed on-site basin system designed to slow peak flow and discharge to rates equal to or less than existing conditions. Hydro-modification management would occur through storage of storm water within the basins, with outlets that regulate the flow rate and duration of storm water released. Source control and low impact development measures would be implemented to incorporate water impervious surfaces and grassy swales to slow and absorb runoff, allowing it to infiltrate the ground surface.

Further, approximately 757.7 acres on-site (e.g., resource open space and HOA-managed habitat open space) would remain as undeveloped open space for resource protection, in addition to the 13.3 acres of community recreational facilities, neighborhood parks, and other landscaped areas within the development footprint, thereby allowing groundwater recharge in these areas to continue with project implementation.

As designed, the project is not anticipated to substantially deplete groundwater supplies or interfere substantially with groundwater recharge as no groundwater would be used for project construction or operation, and approximately 757.7 acres of the site would remain as undeveloped open space (e.g., impervious area) with project implementation. Impacts would be **less than significant**.

Threshold 3: 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/increased erosion or siltation on- or off-site?

The project includes a drainage network designed to control and filter storm water runoff in conformance with RWQCB and City of Escondido requirements which call for retention first, then bioretention. The proposed storm water system would include the use of biofilters, on-site storage of storm water in basins with outlets that regulate the flow rate and duration of storm water released, and the use of both retention and detention basins to slow and sequester runoff. Improvements for the management of storm water would also include construction of several roadway undercrossings that would adequately convey peak runoff via boxed culverts (see **Figure 2.8-4**).

As designed, the project would preserve the natural on-site drainage courses within the tributary areas. With construction of the project, drainage patterns would remain the same as under existing conditions, with Drainage Areas A and B maintaining the same two points of

discharge (**Appendix 2.8-1**, page 3). Under the proposed condition, Drainage Area A would total approximately 402 acres and would consist of two neighborhoods offering half-acre and 1-acre lots. Under the proposed condition, Drainage Area B would total approximately 1,958 acres and would include the remaining five neighborhoods with 7,000- to 9,900-square-foot pads, as well as the fire station and recreation facilities.

Some off-site drainage would be collected by a series of brow ditches and/or a separate storm drain system that would convey the runoff around the development to discharge into each tributary's natural conveyance channel. The proposed ditches would be sized to convey the storm water with adequate freeboard. Runoff from the developed areas would be routed to the proposed on-site street system and conveyed via curb and gutter until it reaches curb inlets and is intercepted by storm drain inlets. Each storm drain system has been designed to route storm water to multipurpose basins proposed throughout the site. These basins would provide water quality treatment, hydromodification management, and flood attenuation to treat and release urban runoff at peak flow rates at or below existing conditions. Energy dissipaters (e.g., riprap) would also be installed at outfall locations to mitigate discharge velocities (see **Figures 2.8-2** through **2.8-3B**, which show the proposed on-site drainage conditions with project implementation).

Modeling results show that, for Drainage Area A, an increase in the peak 100-year flow rate from the existing to the proposed condition at the downstream comparison locations would occur with project implementation (see **Appendix 2.8-1**, page 11). Drainage Area A proposes five detention basins within the development area to address peak flow mitigation. Detention routing calculations performed for this portion of the site indicate that the proposed detention basins would mitigate peak flow rates such that at the downstream comparison location, the proposed 100-year, 24-hour discharge rate would be 1,624.3 cubic feet per second (cfs) or below the existing conditions flow rate of 1,684.5 cfs.

Drainage Area B proposes six detention basins throughout the area to address peak flow mitigation. Detention routing calculations performed for this portion of the site show that the proposed detention basins would mitigate peak flow rates such that at the downstream comparison location, the proposed 100-year, 24-hour discharge rate of 4,357.6 cfs would be less than the existing conditions flow rate of 4,551.6 cfs (see **Appendix 2.8-1,** page 11).

Appendix 2.8-1 provides the basic hydrologic information and riser dimensions for the proposed detention basins, as well as the culvert peak flows and discharge results for the proposed culvert crossings. The results indicate that development of the project site as proposed would not increase peak flows for any point of discharge (see **Appendix 2.8-1**, pp 11-12). The project would therefore not compromise the capacity of downstream drainage facilities, and effects due to erosion and sedimentation are anticipated to be minimal.

As described above, the project as designed would not substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial or increased erosion or siltation on- or off-site. As such, project impacts would be **less than significant**.

Threshold 4: 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 of surface runoff in a manner which would result in flooding on- or off-site?

Refer to the discussion for Threshold 3 above.

As discussed above, the proposed detention basins for both Drainage Areas A and B would mitigate peak flow rates such that at the downstream comparison locations, the proposed 100-year, 24-hour discharge rates would be below the existing conditions flow rates (see **Appendix 2.8-1**, pp 11-12).

Project implementation would not substantially alter the existing drainage pattern of the site or area, or substantially increase the rate or amount of runoff in a manner that would result in flooding on- or off-site. Impacts would be **less than significant**.

Threshold 5: Would the project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Refer to Thresholds 1, 3 and 4 above. There are no existing storm drain features on-site. The project design includes improvements to allow connection to the City's existing storm water infrastructure system. Proposed improvements would ensure that storm water flows are properly maintained and treated on-site so that runoff volumes and/or velocities do not exceed that which currently occur under existing conditions. Further, as described under Threshold 1, the project would be subject to NPDES requirements and other local, state, and federal regulations pertaining to maintaining water quality and minimizing potential adverse effects on downstream water bodies.

The City's existing storm water system is adequate to accommodate additional flows generated by the project. Therefore, storm water runoff from the site would not create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff**.** As such, impacts would be **less than significant**.

Threshold 6: Would the project otherwise substantially degrade water quality?

Refer to Threshold 1 above. The project would be subject to federal, state, and local regulations pertaining to storm water quality to ensure that the project does not adversely affect downstream water bodies. Further, BMPs are proposed and would be implemented during construction and operation to maintain water quality and minimize potential effects relative to erosion and sedimentation.

The project would not substantially degrade water quality. Impacts would be **less than significant**.

Threshold 7: Would the project place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

The FEMA maps applicable to the project site indicate that the property is located within Zone X, indicating that the site lies outside of the 500-year floodplain (which has a flood hazard frequency potential less than areas designated as being outside of the 100-year floodplain boundary). As such, the project as designed would not place housing within a mapped 100-year flood hazard area. **No impact** would occur.

Threshold 8: Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Refer to Threshold 7 above. The project site is not located within a 100-year flood hazard area, and no structures are proposed that would impede or redirect flood flows. **No impact** would occur.

Threshold 9: Would the project expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?

Inundation results when impounded water is released from a dam due to structural failure or overtopping. Such failure typically occurs during periods of substantial rainfall or as the result of inadequate construction or improper maintenance, or from structural damage resulting from seismic events. Lands located downstream in the vicinity of a dam are at the highest risk, while properties located farther downstream would generally experience a lesser magnitude of damage and potential risk to life and property.

The San Diego Multi-Jurisdictional Hazard Mitigation Plan identifies dam failure risk levels. A high hazard risk is identified for dams storing 1,000 acre-feet (AF) or more of water, having a height of more than 150 feet, and having the potential for downstream property damage and/or downstream evacuation. According to the MJHMP, approximately 86,360 people, 12,393 residential buildings, and 424 commercial buildings in Escondido would be potentially exposed to flood hazards related to dam failure (San Diego County 2010).

Portions of Escondido are subject to the risk of dam inundation from Lake Wohlford and Lake Dixon, according to Figure 4.9-2, Dam Inundation Areas, of the City's General Plan Community Protection Element. Locations in the vicinity of Escondido Creek, downtown Escondido, and the City's urban core are at the greatest risk for inundation due to dam failure. According to General Plan Figure 4.9-2, the project site is not located in an area subject to inundation due to dam failure. No levees are located in the vicinity of the project site; therefore, the project would not be subject to failure resulting in risk of loss, injury, or death involving flooding.

The project would not expose people or structures to flooding as a result of the failure of a levee or dam. **No impact** would occur.

Threshold 10: Would the project cause inundation by seiche, tsunami, or mudflow?

The project site is located approximately 18.2 miles east of the Pacific Ocean (nearest coastline). Because of its inland location, the project site is not considered to be subject to the potential for impacts related to tsunami events. Further, Escondido is not included on the California Department of Conservation (2016) San Diego County Tsunami Inundation Map.

A seiche is a standing wave that occurs within an enclosed body of water. Lands adjacent to a shoreline of a lake or reservoir are subject to inundation by a seiche. A seiche event may result with strong winds, seismic events, or atmospheric pressure changes. These conditions affect the size of a seiche. The extent of land affected is influenced by varying conditions such as size and depth of the water body, elevation at which the water body is located, cause of the event, and the conditions of containment of the water body (e.g., natural or man-made).

No large bodies of surface water (e.g., lakes, reservoirs) are present in the vicinity of the project site. The closest such bodies of water to the project site are the Lake Wohlford Dam and Lake Dixon, which are located approximately 2.0 miles to the north and 2.9 miles to the northwest, respectively. Due to the distance of these water bodies from the subject site, the risk for inundation from seiche is considered to be low.

Mudflows are generally shallow water-saturated landslides that move rapidly downslope, carrying rocks, brush, and other debris. Mudflow events largely occur during or following periods of heavy rainfall on slopes with loose soil or debris, and generally having a slope of 25 percent or greater. According to the General Plan EIR, Section 4.9, Hydrology and Water Quality, mudflows can be initiated on slopes as low as 15 degrees, but are more frequently found on slopes as steep as 45 degrees. Slope instability more frequently occurs in areas prone to surficial failures, mudflows, debris flows, rockfalls, or erosion. Failure of man-made slopes also poses a threat under conditions such as soil saturation caused by over-irrigation or during excessive rainfall events, as well as in areas recently burned by wildfires susceptible to flash floods and debris flows during rainstorms.

The project has been designed to largely avoid development of on-site areas where steep slopes are present. Cut slopes are proposed at a maximum ratio of 1.5:1 (horizontal to vertical); fill slopes are proposed at a maximum ratio of 2:1. Following construction, all graded slopes would be planted for erosion control, and manufactured slopes would be landscaped in accordance with an approved landscape plan. Additionally, to ensure slope stability in areas where manufactured slopes are proposed, the project would be required to conform to all design measures identified in the preliminary geological technical report to minimize and/or avoid the potential for mudflow events to adversely affect the subject site. As such, the potential for mudflow events to occur with the project is considered to be low.

Due to the above-described conditions, and as designed, the project is not anticipated to be subject to inundation by seiche, tsunami, or mudflow. Impacts would be **less than significant**.

2.8.5. Sources Cited

California Department of Conservation. 2016. San Diego County Tsunami Inundation USGS 24K Quads. Accessed January 17, 2017. http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/SanDiego.

Escondido, City of. 2012a. *General Plan*. https://www.escondido.org/general-plan.aspx.

———. 2012b. *Escondido General Plan Update, Downtown Specific Plan Update, and Climate Action Plan Environmental Impact Report*. https://www.escondido.org/general-plan-update.aspx.

Federal Emergency Management Agency – National Flood Insurance Program. 2012a. Flood Insurance Rate Map – Panel 06073C1101G. https://msc.fema.gov/portal.

———. 2012b. Flood Insurance Rate Map – Panel 06073C0850G. https://msc.fema.gov/portal.

Hunsaker & Associates. 2017. *CEQA Drainage Study*. Appendix 2.8-1

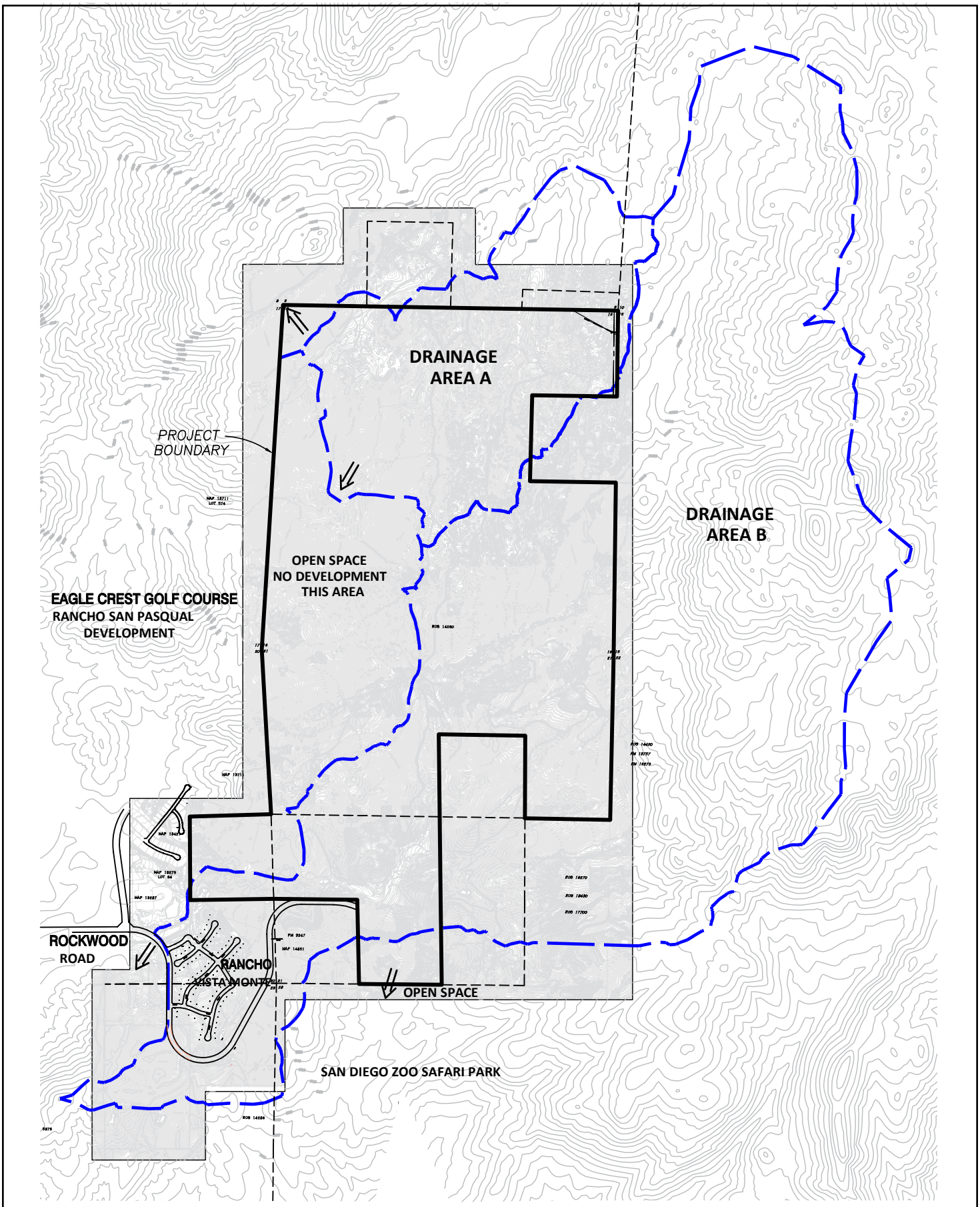
———. 2017. *Priority Development Project Storm Water Quality Management Plan*. Appendix 2.8-2

RWQCB (San Diego Regional Water Quality Control Board). 2017. San Diego Region – Storm Water. http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/.

_____. 2016. *Water Quality Control Plan for the San Diego Basin*. Adopted September 1994; amended May 2016. http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan.

San Diego County. 2010. *San Diego Multi-Jurisdictional Hazard Mitigation Plan*. http://www.sandiegocounty.gov/content/dam/sdc/oes/docs/2010-HazMit-Final-August-2010.pdf.

THIS PAGE INTENTIONALLY LEFT BLANK



Michael Baker INTERNATIONAL

Source: Hunsaker and Associates, 2016.
153095Figures.indd

N

Not to Scale

Safari Highlands Ranch and Citywide SOI Update ▪ Environmental Impact Report

PROJECT WATERSHED MAP

Figure 2.8-1

THIS PAGE INTENTIONALLY LEFT BLANK.

PRSH01
PRSH07
PRSH03
PRSH10
J01
PRSH02
BASIN A
J06
J02
BASIN D
PRSH11
PRSH08
BASIN C
J03
BASIN B
PRSH04
PROJECT BOUNDARY
PRSH05
J05
PRSH06
J04
PRSH09
BASIN F'
J08
DRAINAGE AREA B
PER EXHIBIT 2B

N

300 0 300 600 900

LEGEND

DRAINAGE WATERSHED BOUNDARY

FLOW DIRECTION

HYDROLOGIC NODE (HEC-HMS JUNCTION) J03

Michael Baker INTERNATIONAL

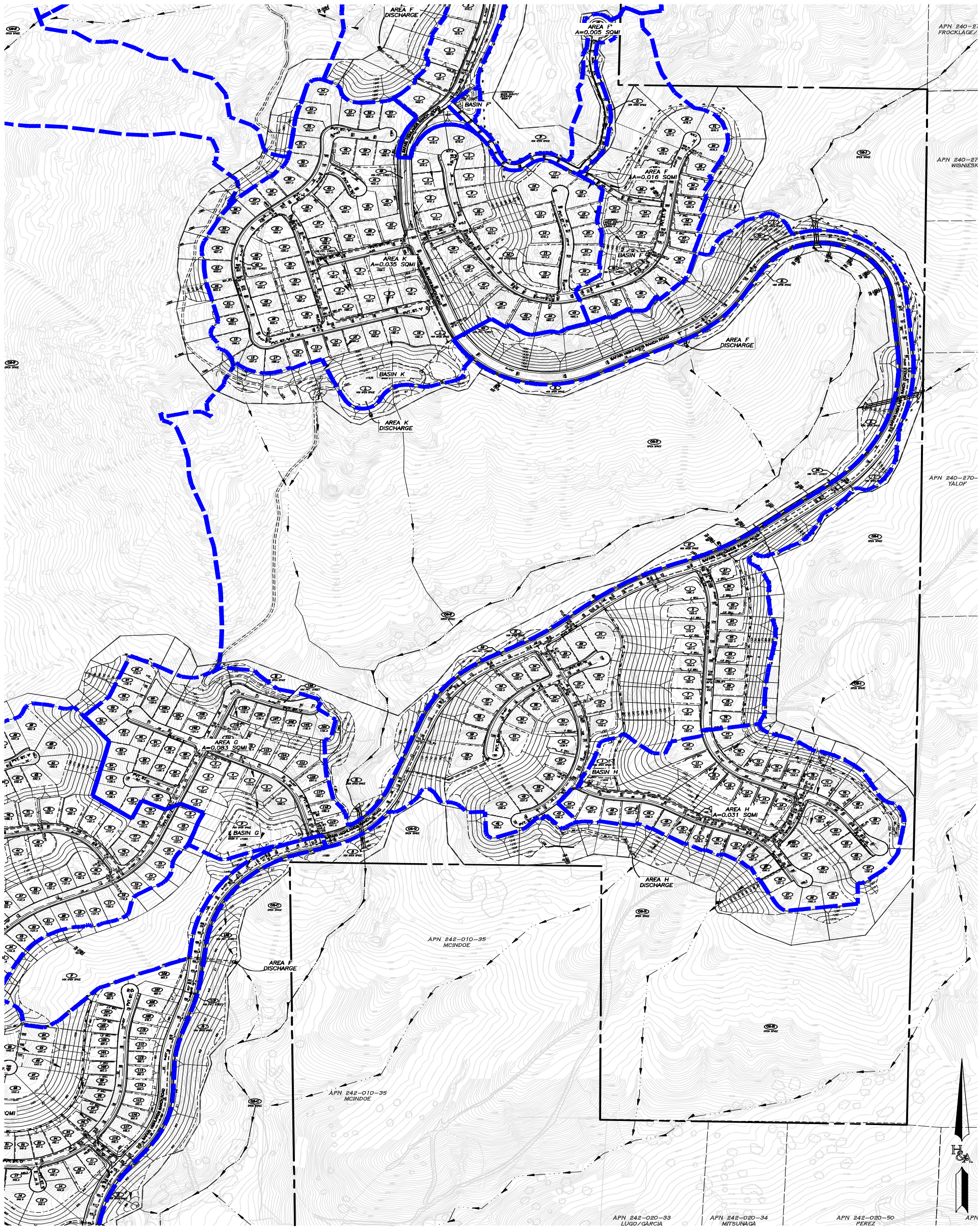
Source: Hunsaker and Associates, 2016.
153095Figures.indd

Safari Highlands Ranch and Citywide SOI Update ▪ Environmental Impact Report

HYDROLOGY MAP - PROPOSED CONDITION (DRAINAGE AREA A)

Figure 2.8-2

THIS PAGE INTENTIONALLY LEFT BLANK.



Michael Baker INTERNATIONAL

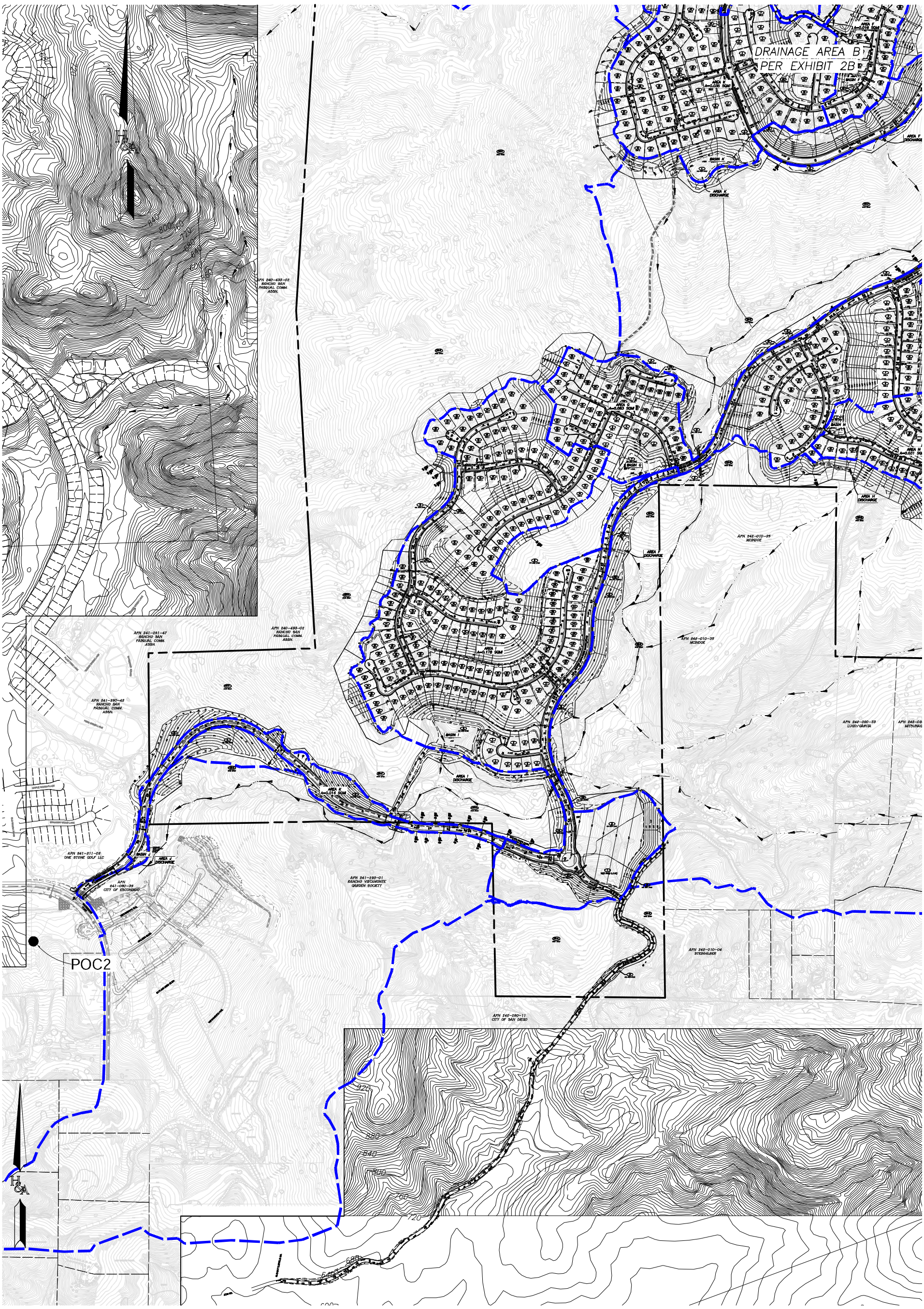
Source: Hunsaker and Associates, 2016.
153095Figures.indd

Safari Highlands Ranch and Citywide SOI Update ▪ Environmental Impact Report

HYDROLOGY MAP - PROPOSED CONDITION (DRAINAGE AREA B)

Figure 2.8-3A

THIS PAGE INTENTIONALLY LEFT BLANK.



Michael Baker INTERNATIONAL

Source: Hunsaker and Associates, 2016.
153095Figures.indd

Safari Highlands Ranch and Citywide SOI Update ▪ Environmental Impact Report

HYDROLOGY MAP - PROPOSED CONDITION (DRAINAGE AREA B)

Figure 2.8-3B

THIS PAGE INTENTIONALLY LEFT BLANK.

0 400 800 1200

H&A

LEGEND

PROJECT BOUNDARY

CULVERT LOCATION

BASIN LOCATION

Michael Baker INTERNATIONAL

Source: Hunsaker and Associates, 2016.
153095Figures.indd

Safari Highlands Ranch and Citywide SOI Update ▪ Environmental Impact Report

PROPOSED BASIN AND CULVERT LOCATIONS

Figure 2.8-4

THIS PAGE INTENTIONALLY LEFT BLANK.