

**Appendix F:  
Hydrology and Water Quality Analysis**

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**Memo**

To: Yael Marcus (FirstCarbon Solutions)  
From: Ed Ballman, P.E. CFM  
Date: May 7, 2021  
Subject: Draft Review of the Preliminary Stormwater Treatment Plan and Hydrology Summary for the Bishop Ranch 6 Project, City of San Ramon

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I'd like to begin by thanking you for providing Balance Hydrologics the opportunity to review of the stormwater management documentation provided for the proposed land use conversion of the Bishop Ranch 6 site located in the City of San Ramon in Contra Costa County.

Our review has been based on a limited amount of information that includes the following:

- the Project Description prepared by SummerHill Homes dated February 2, 2021 and a preliminary Site Plan dated February 1, 2021 that were attached to the Request for Proposals issued by the City.
- a memorandum titled 'Preliminary Stormwater Treatment Plan and Hydrology Summary Bishop Ranch 6' prepared by Carlson, Barbee and Gibson and dated January 27, 2021.

This information was supplemented by concurrent review of publicly available data pertinent to stormwater management at the site such as County design standards, soil survey data published by the Natural Resources Conservation Service, and floodplain mapping prepared by the Federal Emergency Management Agency.

The proposed project constitutes redevelopment of an approximately 31-acre site that is currently the location of office buildings and extensive paved parking areas. The proposed project would remove all previous improvements to allow construction of a 404-unit residential community that would include an approximately 2-acre park. It is important to note that the existing site was developed prior to the implementation of many pertinent current stormwater management regulations. Therefore, the proposed project will need to implement a number of stormwater management measures, particularly those related to runoff water quality enhancement, that were not part of earlier land planning. However, the preliminary materials provided indicate that the total impervious area at the site would

actually be reduced, and this will limit the potential for impacts related to drainage both at the site and in the downstream stormwater infrastructure.

The following review comments, arranged by issues of potential concern, are based primarily on the contents of the updated January 2021 memorandum supplemented by pertinent additional information where applicable.

- *Floodplain Management Considerations.* Review of the FEMA Flood Insurance Rate Map covering the project area shows that the site is not located in a Special Flood Hazard Area, with the closest potential flooding source, San Ramon Creek, well to the west across the I-680 highway corridor and shown as contained in its channel as shown in Figure 1.

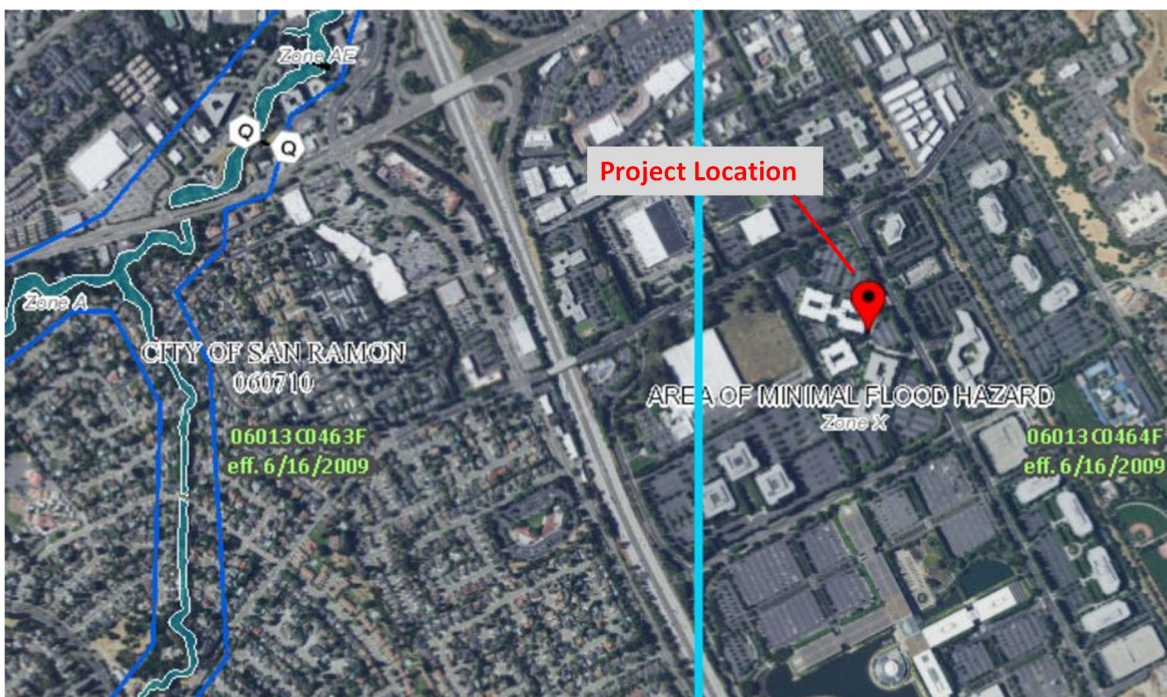


Figure 1. Excerpt from FEMA Flood Insurance Rate Map 06013C0464F

- *Water Quality Management.* The Preliminary Stormwater Treatment Plan presents a broad overview of the runoff water quality measures that will be implemented with the proposed project but provides no specific facility sizing calculations. This demonstrates the project intent to implement Integrated Management Practices (IMPs) as required in Contra Costa County to comply with the Regional Municipal Stormwater Permit issued by the San Francisco Regional Water Quality Control Board. The memorandum correctly notes that the IMP Calculator should be used to provide facility sizing consistent with the C.3 Technical Guidance published by the Contra Costa Clean Water Program (or other recent facility sizing formulas that

account for differences in mean annual rainfall). The project approach for water quality management correctly anticipates treating the runoff from the entire project site using the IMPs since the project will replace over half of the existing impervious cover per the so-called “50% rule” and indicates that this will be done with a combination of gravity-flow and pumped facilities that utilize bioretention as the treatment mechanism. Stormwater management strategies of this type are now commonplace for higher-density projects in the greater Bay Area.<sup>1</sup>

- *Hydromodification Management.* Projects that create more than one acre of new impervious cover are generally required to include measures to address the potential for hydromodification impacts, unless they are located in areas that are exempt from such requirements. In this case, the memorandum is correct in noting that redevelopment projects that result in reduced impervious cover are exempt from hydromodification management requirements. Therefore, providing appropriately sized IMPs for treatment only will be sufficient to comply with the requirements of the Contra Costa Clean Water Program.
- *Peak Flow Controls.* The memorandum also appropriately notes that the reduction in overall impervious cover can reasonably be expected to result in reduced peak stormwater flow rates to the local storm drain system. That said, we were not able to review information regarding the existing connections to the City storm drain lines. Projects of this type typically strive to maintain comparable drainage areas at the connection points to off-site trunk lines and/or provide supporting calculations or modeling to demonstrate that any modification in site drainage patterns can be accommodated in the downstream system. There is no reason to believe that the final project plans would not be able to utilize either approach (or a combination thereof with limited on-site runoff detention storage) to avoid off-site impacts.

The above information would appear to address the main issues related to hydrology and water quality associated with the project and will hopefully facilitate your review of the project for compliance with the requirements of the California Environmental Quality Act. Of course, Balance staff will be readily available to provide additional clarifying information or answer questions as the process moves forward.

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<sup>1</sup> Another desirable stormwater management strategy, where practical, is on-site infiltration. However, soil mapping from the Natural Resources Conservation Service shows that the entire site is likely underlain by Botella clay loam soils. They characterize this soil type as having a saturated hydraulic conductivity on the order of 0.40 inches/hour, which is quite low and not conducive to the use of on-site infiltration approaches.



January 27, 2021  
Job No.: 3236-010

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## MEMORANDUM

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**TO:** Public Works Department, City of San Ramon

**FROM:** Ryan T. Hansen

**SUBJECT:** Preliminary Stormwater Treatment Plan and Hydrology Summary  
Bishop Ranch 6  
San Ramon, California

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The proposed development will be located at the existing Bishop Ranch 6 office space in the City of San Ramon. The project proposes to remove all existing buildings and construct 268 single-family and 136 multi-family units for a total of 404 residential units, in addition to 2.0 acre park.

Based on preliminary hydrology calculations per the Rational Method and Contra Costa County Flood Control District standards, the post development flows are expected be lower (34.5cfs) than the pre development flows (38.0 cfs). Given there is no increase in the post development stormwater runoff, hydromodification measures are not required to be implemented with these improvements. Further detailed calculations in addition to a hydrology report will be provided with the construction drawings.

Per the Contra Costa County (CCC) Stormwater C3 Guidebook, this project will be required to treat stormwater runoff prior to discharging to the existing public storm drain system. The County provided IMP calculator was used to determine the storage volume and bio retention area required to treat this project's stormwater runoff. A portion of the property abutting Norris Canyon Road and various landscape paseos including buildings, within the site, will gravity drain and be treated via bio-retention prior to connecting to an existing catch basin at the northern corner of the project frontage. The majority remainder of the property will drain to an underground cistern in the park. From the underground cistern, stormwater will then discharge to at grade bio retention via low flow treatment pumps for treatment prior to draining to the existing public storm drain system. This bio-retention area was sized appropriately due to the implementation of the cistern per the guidelines set forth in the CCC Stormwater C3 Guidebook. In the event of a large storm event, a bypass pipe has been provided to ensure no flooding will occur on site.