4.10 HYDROLOGY AND WATER QUALITY

This section describes hydrologic and flooding characteristics of the project site and vicinity and analyzes the potential for the project to impact water quality, groundwater, surface drainage, and flooding. Information regarding hydrology and water quality to provide a basis for the analysis of potential impacts was obtained through:

- Geotechnical Exploration, prepared by ENGEO in 2013 (see **Appendix I**)
- Preliminary Drainage Study, prepared by Aliquot Associates in August 2017 (see **Appendix N**)
- Walnut Creek Watershed Atlas
- California Environmental Protection Agency State Water Resources Control Board
- Contra Costa County Mapping Information Center
- Personal Communication with Brooks Ramsdell, Engineering Geologist, ENGEO
- *The Contra Costa County General Plan 2005-2020* (General Plan)
- Stormwater Control Plan, prepared by Aliquot Associates in March 2018

These reports are available for review at the Contra Costa County (County), Department of Conservation and Development, Community Development Division, 30 Muir Road, Martinez, California.

In response to the Notice of Preparation for this draft environmental impact report, the County received a comment from a local resident regarding inadequate drainage on the southeast corner of the project site, noting that added hardscape will worsen these conditions. This comment is addressed in the following sections.

4.10.1 EXISTING CONDITIONS

Regional Characteristics

The project site is located in Contra Costa County within a valley bound to the west by the East Bay Hills and to the east by the Mount Diablo range. Nearly all the County's creeks originate in the high elevations of these two mountain ranges before flowing down to the valleys and coastal plains. Approximately 1,350 miles of waterways run through the County's 31 watersheds and subwatersheds (Contra Costa County Community Development Department, 2004).

The project site is located within the San Ramon Creek Watershed, a subwatershed of the Walnut Creek Watershed. As San Ramon Creek flows north through the San Ramon Valley, it collects Bollinger Canyon Creek, Green Valley Creek, and Sycamore Creek as they drain the surrounding hillsides. Upon reaching the City of Walnut Creek, San Ramon Creek's main channel flows underground and intersects Las Trampas Creek to form Walnut Creek. Walnut Creek flows down flood control channels into the tidal Pacheco Slough (sometimes referred to as Lower Walnut Creek). Pacheco Slough passes through Concord Marsh, a 6,500 acre complex of tidal mashers that drains Peyton Creek, Walnut Creek, and Mount Diablo watersheds, before emptying into Suisun Bay (Walnut Creek Watershed Council, 2013).

Local Hydrology

The project site is a mostly undeveloped area at the toe of Las Trampas Ridge. Though the project site is fairly flat, it borders very steep terrain along the western adjacent open space area. Site elevations within the project site range from 350 to about 384 feet above mean sea level, and existing development contributes about 131,571 square feet of impervious surface,[1] or approximately 5 percent of the total project area (Aliquot Associates, 2018a). The principal hydrologic sources for the study area are direct precipitation, surface runoff from surrounding uplands, and channelized flow through the seasonal channels.

There are two creek drainages that convey seasonal runoff from open space land to the west through the project site. Drainage 1 cuts through the middle of the project site, as indicated in **Figure 4.10-1**. This feature is non-navigable, seasonal to relatively permanent, and extends for 1,364 linear feet. Drainage 2 is a seasonal channel that extends for approximately 217 linear feet along the southeastern border of the project site. It conveys a low volume of surface flow on an infrequent basis. Both drainages discharge into the storm drain system, which empties into San Ramon Creek (Mosaic Associates, 2016).

As shown in **Figure 4.10-1**, there are five areas of seasonal freshwater wetland within the project site:

- Wetland 1 is located west of the residence, and appears to be isolated.
- Wetland 2 is located in the eastern portion of the project site, and is associated with culverted discharge from Drainage 2. Wetland 2 may also be associated with a seep resulting from earthwork to create the office building pad.

[1] Impervious surface refers to materials and structures that cannot be penetrated by water. Examples include concrete streets, the roofs of buildings, and highly compacted soil.

- Wetland 3 is located just east of Wetland 2, and is situated in a low-lying portion of the project site next to a culvert that conveys runoff from this area into stormwater system beneath Camille Lane.
- Wetland 4 is located on East Bay Regional Park District (EBRPD) property southwest of the project area, situated immediately upstream and in the same channel as Drainage 2.
- Wetland 5 is located just west of Wetland 4, situated in an opening surrounded by eucalyptus trees.

Drainage and Stormwater

The majority of stormwater runoff on the project site currently percolates into the soil or collects in the on-site Drainages (Aliquot Associates, 2018b). Stormwater that does not infiltrate into the ground eventually drains via channelized and overland flow into a drainage system under Camille Avenue (Camille Avenue system), which ultimately delivers water to San Ramon Creek. Portions of the site also drain to a system at Hemme Avenue, which also delivers water to San Ramon Creek.

Three local drainage areas convey water from the eastern slope of Las Trampas Ridge through the project site before ultimately emptying into San Ramon Creek. These drainages are discussed in detail below and shown on **Figure 4.10-1.**

- **Drainage Area I** drains the northeastern 28.31 acres of the project site. Sheet flow commences at the western edge of the open space and passes through the site before entering a ditch, which intersects with a catch basin to a 30-inch stormwater pipe at Hemme Avenue that empties into San Ramon Creek.
- **Drainage Area II** extends 0.76 mile west to Las Trampas Ridge, encompassing 157.42 acres with an elevation difference of nearly 1,000 feet. Runoff flows from Las Trampas Ridge through EBRPD's land and the open space west of the project site. This water is conveyed through the project site within small, shallow, rock-lined stream (Drainage 1), which continues through the project site to the Camille Avenue system.

  The Camille Avenue system begins at a concrete headwall/drop structure. A 48-inch drain pipe exits the structure and expands to a 60-inch pipe at the intersection of Escondido Court and Camille Avenue before emptying into San Ramon Creek. The existing Camille Avenue storm drain system was designed in 1969 and assumed more intense development of the Drainage Area II (Aliquot Associates, 2018b).
- **Drainage Area III** consists of 27.28 acres that contribute stormwater through the site before entering Camille Avenue system at Escondido Court. A portion of this drainage site falls outside of the project boundary, but still contributes runoff to the site. Beginning in EBRPD lands, runoff flows into a small creek

(Drainage 2) along the southern border of the proposed residential area, than sheet flows to a 10-inch outlet pipe at the southeast corner of the project site. The drainage continues across Camille Lane through a series of pipes before entering the Camille Avenue system at the intersection of Escondido Court.

Flooding

A review of the Federal Emergency Management Agency (FEMA) Flood Zone Maps for the County indicates that the project site is not subject to flooding during a 100-year flood event (Federal Emergency Management Agency, 2009). The project site and immediate vicinity are designated as an unshaded "Zone X," delineating a minimal flood risk hazard according to FEMA. Such lands are considered outside areas where flooding could occur on a 500-year basis. The nearest floodway areas are San Ramon Creek and a flood zone located 750 feet northwest of the northern corner of the project site (Contra Costa County Mapping Information Center, 2015).

Groundwater

Groundwater was not encountered on the project site during a geotechnical investigation (ENGEO, 2013). Field expeditions occurred in late-July, early-August of 2008, and included excavating seven test pits, which ranged from 2.5 feet-10 feet deep, and a 218-foot-long exploratory trench that averaged 10 feet to 12 feet deep. The study acknowledged groundwater fluctuations may occur based on annual variations in precipitation, temperature, irrigation, and other seasonal factors.

The project site is lies within a priority basin in the California Statewide Groundwater Elevation Monitoring Program (CASGEM). This program is designed to track seasonal and long-term trends in groundwater elevations in California's groundwater basins. Within the CASGEM program, the basin below Alamo is designated with "very low" priority (California Department of Water Resources, 2014).

Water Quality

Pollutant sources discharging to creeks and other bodies of water may include both "point" and "nonpoint" discharges.

A point source is any discernible, confined, and discrete conveyance (e.g., a pipe discharge) of pollutants to a water body from such sources as industrial facilities or wastewater treatment plants. Point sources are subject to measures designed to protect the overall water quality of the creeks and San Francisco Bay, including water quality requirements, periodic monitoring, annual reporting, and prohibitions of the discharge of pollutants by regulatory agencies, as well as other requirements.

Nonpoint pollutant sources are sources that do not have a single, identifiable discharge point, but are rather a combination of many sources. A nonpoint source can be stormwater runoff from land that contains, for example, petroleum from

parking lots, pesticides from farming operations, or sediment from soil erosion. Section 303(d) of the Federal Clean Water Act requires that states develop a list of impaired water bodies that do not meet water quality standards. As of January 2017, the San Ramon Creek did not appear on the list of impaired streams prepared by the Regional Water Quality Control Board (RWQCB) (California Environmental Protection Agency State Water Resources Control Board, 2017).

4.10.2 REGULATORY SETTING

Federal

Clean Water Act

The Clean Water Act (CWA) was enacted by Congress in 1972 and amended several times since inception. It is the primary federal law regulating water quality in the United States, and forms the basis for several State and local laws throughout the country. Its objective is to reduce or eliminate water pollution in the nation's rivers, streams, lakes, and coastal waters. The CWA prescribed the basic federal laws for regulating discharges of pollutants as well as set minimum water quality standards for all "waters of the United States." Several mechanisms are employed to control domestic, industrial, and agricultural pollution under the CWA. At the Federal level, the CWA is administered by the U.S. Environmental Protection Agency (EPA). At the State and regional level, the CWA is administered and enforced by the State Water Resources Control Board (SWRCB) and the RWQCB. The State of California has developed a number of water quality laws, rules, and regulations, in part to assist in the implementation of the CWA and related federally mandated water quality requirements. In many cases, the Federal requirements set minimum standards and policies and the laws, rules, and regulations adopted by the State and regional boards exceed the Federal requirements.

Project Consistency Analysis

The project would include a storm water drainage and treatment system to convey runoff into San Ramon Creek. Bioretention facilities would serve as soil filtration and would treat the water to reduce water quality impacts to receiving waters.

The system will be designed per criteria in the C.3 Stormwater Technical Guidance Manual and the California Stormwater Best Management Practice Handbook to provide a level of treatment that meets or exceeds existing standards, as described elsewhere in this section. During construction, erosion control and stormwater pollution prevention plans would prevent construction-related pollution from contaminating downstream receiving waters consistent with the above mentioned documents. As such, the project would be consistent with the CWA.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act establishes the SWRCB and the RWQCB as the principal State agencies having primary responsibility for coordinating and controlling water quality in California. The Porter-Cologne Act establishes the responsibility of the RWQCBs for adopting, implementing, and enforcing water quality control plans (Basin Plans), which set forth the state's water quality standards (i.e., beneficial uses of surface waters and groundwater) and the objectives or criteria necessary to protect those beneficial uses.

National Pollution Discharge Elimination System (NPDES)

Water runoff quality is regulated by the Federal National Pollution Discharge Elimination System (NPDES) program (established by the Clean Water Act of 1972). The NPDES objective is to control and reduce pollutants to water bodies from non-point discharges. RWQCB administers this program throughout the state. The RWQCB issues NPDES point source permits for discharges from major industries and non- point source permits for discharges to water bodies in the Central Valley region for the municipality's other dischargers.

Additionally, improvement projects disturbing more than 1 acre of land during construction are required to file a Notice of Intent (NOI) to be covered under the State NPDES General Construction Permit for discharges of storm water associated with construction activity. A developer must propose control measures that are consistent with the State General Construction Permit. A Storm Water Pollution Prevention Plan (SWPPP) must be developed and implemented for each site covered by the state's General Permit. A SWPPP must include "Best Management Practices" (BMPs) designed to reduce potential impacts to surface water quality through the construction and life of the project.

Contra Costa County Provision C.3 Requirements

The County has the authority to uphold its NPDES permit, and currently exercises this authority in its adopted Provision C.3 requirements. The provisions require the installation of post-construction BMPs for new development as part of the Federal NDPES program, and have set standards for their implementation.

In compliance with Provision C.3 of the NPDES Permit and the County's Stormwater Management and Discharge Control Ordinance (Section 1014), projects creating and/or replacing (redeveloping) impervious area exceeding 10,000 square feet shall submit a Storm Water Control Plan (SWCP) for the review and approval of the Public Works Department. The SWCP is a separate document from the SWPPP. Provision C.3 requires these projects to treat storm water runoff with permanent storm water management facilities, and requires projects creating and/or redeveloping

impervious area exceeding 1 acre to design such facilities to control runoff rates and volumes (in addition to treatment).

To comply with these requirements, new developments are required to install water quality storm water runoff BMPs that filter or treat rainfall runoff generated from storm events up to approximately the 85th percentile rainfall event (or approximately the 1-inch storm event) before discharging into natural drainage systems. Additional hydrograph modification BMPs are also required so that post-project runoff does not exceed pre-project rates or durations, such an increase could contribute to erosion in receiving waters downstream from the project.

Project Consistency Analysis

Consistent with NPDES and Provision C.3 requirements, the proponent submitted a SWCP with its development application. Information from the SWCP is included in the impact analysis discussions below.

Local

Contra Costa County General Plan

The General Plan includes the following policies to manage water resources and flood risk, which are presented in Chapter 7, Public Facilities/Services and Chapter 8, Conservation of the General Plan.

Public Facilities/Services Element

7-23: The County shall cooperate with other regulatory agencies to control point and non-point water pollution sources to protect adopted beneficial uses of water.

7-26: The need for water system improvements shall be reduced by encouraging new development to incorporate water conservation measures to decrease peak water use.

7-45: On-site water control shall be required of major new developments so that no significant increase in peak flows occurs compared to the site's pre-development condition, unless the Planning Agency determines that off-site measures can be employed which are equally effective in preventing adverse downstream impacts expected from the development or the project in implementing an adopted drainage plan.

7-46: Regional detention basins shall be favored over smaller, on-site detention basins.

7-55: As appropriate and to the extent allowed by law, assess all new development projects at least $0.35 per square foot of impervious surface created. This drainage fee is to be collected through existing County Flood Control drainage area fee ordinances, newly adopted drainage area fee

ordinances, existing and new assessment districts, or other financial entities. The fee may be applied to the cost of any developer-sponsored regional flood control improvements on- or off-site which mitigate the project's flooding impacts. Regional facilities are defined as systems sized to handle at least 15 cubic feet per second and suitable for public agency maintenance, i.e., 24-inch diameter and larger storm drains.

Conservation Element

8-23: Runoff of pollutants and siltation into marsh and wetland areas from outfalls serving nearby urban development shall be discouraged. Where permitted, development plans shall be designed in such a manner that no such pollutants and siltation will significantly adversely affect the value or function of wetlands.

8-91: Grading, filling and construction activity near watercourses shall be conducted in such a manner as to minimize impacts from increased runoff, erosion, sedimentation, biochemical degradation, or thermal pollution.

Project Consistency Analysis

The project would include a stormwater drainage and treatment system to convey runoff to San Ramon Creek. Bioretention facilities would allow runoff to from permeable surfaces to filter through the soil, thereby reducing water quality impacts to receiving waters. The project would not introduce any untreated storm water into the emergent marsh or wetland areas, consistent with policy 8-23.

The system would be designed per criteria in the C.3 Stormwater Technical Guidance Manual and the California Stormwater Best Management Practice Handbook to provide a level of treatment that meets or exceeds existing standards, as described elsewhere in this section. During construction, erosion control and storm water pollution prevention plans would prevent construction-related pollution from contaminating downstream receiving waters consistent with the above mentioned documents. As such, the project would be consistent with policies 7-45, 8-23, and 8-27.

4.10.3 IMPACTS AND MITIGATION MEASURES

Significance Criteria

Appendix G of the California Environmental Quality Act (CEQA) Guidelines identifies environmental issues a lead agency can consider when determining whether a project could have significant effects on the environment. The project would have a significant impact if it would:

- Violate any water quality standards or waste discharge requirements.

- Substantially deplete groundwater supplies or interfere 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).
- 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.
- 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.
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional source of polluted runoff.
- Otherwise substantially degrade water quality.
- Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary of Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structure which would impede or redirect flood flows.
- Expose people or structure to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Result in risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

Discussion of No Impacts

Would the project place within a 100-year flood hazard area structure which would impede or redirect flood flows?

and

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

and

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

FEMA publishes maps showing areas of flood risk. FEMA maps 06013C0433F and 06013C0434F show that the project site is not within a 100-year or 500-year flood zone. Therefore, the project would not expose people or structures to risks associated with a 100-year or 500-year flood event. No impact would occur.

Would the project result in risk of loss, injury or death involving inundation by seiche, tsunami or mudflow?

The project site is separated from the San Francisco Bay shoreline by more than 11 miles and substantial intervening topography. Therefore, the possibility of damage from a tsunami is low. Similarly, the project site is separated by over 5 miles and substantial topographical features from the Lafayette reservoir and Upper San Leandro Reservoir. It is not located adjacent to any large body of fresh water that could be expected to overtop its banks during an earthquake, so it is not subject to inundation due to seiche.

There is not a significant potential for mudflow due to the low gradient of the drainage areas west of the site (Ramsell, 2015). In addition, corrective grading measures used to mitigate the landslide hazards will further reduce risk of mudflows (see **Section 4.7, Geology and Soils**). No impact would occur.

Would the project substantially deplete groundwater supplies or interfere 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)?

The project would not utilize groundwater for irrigation or drinking water, and would not therefore deplete groundwater. Water is provided to the project area by

East Bay Municipal Utility District (EBMUD). With respect to groundwater recharge, the project site contains 3.02 acres of impervious surfaces, or roughly 5 percent of the project site. Implementation of the project would add an additional 3.53 acres of impervious surface for a total of 6.55 acres of impervious surface, or approximately 10 percent of the project site. Although there is an increase in impervious surface, drainage flow, which travels over sloped ground under existing site conditions, would be partially retained on padded lots and in bioretention facilities decreasing surface flow rates in some cases and allowing water to infiltrate. Therefore, no impact would occur.

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

Wastewater generated on the project site would originate from residential sources and no industrial wastewater would be generated by the project. As a result, no specific changes to the wastewater treatment plan would be required to treat these flows. No impact would occur.

Discussion of Less-than-Significant Impacts

Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional source of polluted runoff?

The project site contains 3.02 acres of impervious surfaces, or roughly 5 percent of the project site. Implementation of the project would add an additional 3.53 acres of impervious surface for a total of 6.55 acres of impervious surface, or approximately 10 percent of the project site (Aliquot Associates 2018a). When rain falls on impervious surfaces, it washes away litter and chemicals present on the surface, such as petroleum products, paints and solvents, nutrients, pesticides and litter. Once mobilized by stormwater, these chemicals and litter could pollute the waterways on the project site and downstream into San Ramon Creek and the San Francisco Bay.

The Preliminary Drainage Study (**Appendix N**), which assumes development of the entire drainage basin, shows an increase in the 10-year flow rate post-project, and demonstrates that there is adequate capacity in downstream infrastructure for this additional flow. This preliminary analysis addresses potential flood control concerns, and does not account for the bioretention facilities which are designed to both treat the runoff and to provide hydromodification. Stormwater control facilities, including bioretention facilities, are included as project components and would regulate runoff into downstream facilities in compliance with applicable law. The project's SWCP, meanwhile, is designed to ensure capture and treatment stormwater on the project site. According to the SWCP, additional surface runoff

created by impervious surfaces resulting from the project would be managed in various Drainage Management Areas that encompass new impervious surfaces. Specifically, stormwater would be conveyed into self-retaining bioretention facilities. Bioretention areas are graded to capture stormwater and slowly pass it through a biologically active organic layer to filter contaminants. After this detention and percolation, the treated stormwater would be conveyed to proposed storm drain pipes within the right-of-ways for new access roads serving the project. These systems would intertie with existing stormwater facilities serving the project site along Camille Avenue and Hemme Avenue, which are adequately sized to carry post-project flows.[2]

As noted in the introduction to this section, the existing stormwater drainage system at Irongate Court is inadequate. Runoff from Drainage Area 1 currently drains to this system. The drainage system implemented with the project will reroute stormwater from Drainage Area 1 to the Camille Avenue system. Therefore stormwater runoff to the Irongate Court system will not increase. Additionally, the proposed drainage system has been designed to comply with NPDES and the Contra Costa County Public Works Department's C.3 requirements. Consistent with the above, the project's drainage system would comply with the hydromodification criteria developed by the San Francisco Bay Region Municipal Regional Stormwater NPDES Permit (MRP), where such criteria was developed to mitigate potential cumulative impacts from increased flow from new development. This criteria applies to projects with more than one acres of impervious surface and, because the project falls within this category, the project bioretention facilities comply with the MRP hydromodification criteria. Therefore, the quantity of runoff from the project site would not have any significant individual or cumulative impacts.

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?

Drainage Channel Modification

As displayed in **Figure 4.10-1**, two drainage channels travel through the project site. As discussed below, project implementation would substantially alter the pattern of both drainages.

Implementation of the project would fill approximately 168 linear feet of Drainage 1 surface channel and relocate it slightly to the south by creating approximately 185 linear feet of surface channel; replace an existing culvert with approximately 85 linear feet of creek channel; and replace 115 linear feet of surface channel with an

[2] Refer to **Section 4.17, Utilities and Service Systems**, for an analysis of the existing Camille Avenue and Hemme Avenue stormwater systems.

underground storm line extended from the Camille Avenue system. The "B" Court bridge would span Drainage 2, and not require filling the drainage channel. Ultimately, Drainage 1 would discharge directly into a storm drain extension from Camille Avenue. These modifications are shown in **Figure 4.10-2**.

Drainage 2 extends along the southeastern project border. This channel would be extended by 25 linear feet to discharge into a proposed stormwater drain that leads to an existing drainage system at Camille Lane. By discharging directly into this storm drain system, Drainage 2 would no longer contribute water to Wetlands 2 and 3. These wetlands would be filled to accommodate development on this portion of the site. Refer to **Section 4.4, Biological Resources**, for additional detail on these wetlands.

Modifications to the drainage channels allow the gradient of the channel to be lessened, thus reducing water velocity. The channel width will also be enlarged to increase capacity. Creek modifications would not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

Drainage Area Modification

In response to the Notice of Preparation, a local resident commented that the southeast corner of the project site is prone to flooding, which may be exacerbated by added impervious area resulting from the project. Currently, runoff from the 27.28 acres in Drainage Area III is channeled to Camille Lane before flowing under Escondido Court to the Camille Avenue system. With project implementation, drainage from the lower 5.97 acres of Drainage Area III would be rerouted directly to the Camille Avenue. Project modifications would redirect runoff flowing to this area, therefore alleviating flooding on the southeast corner of the project site. This change is shown in **Figure 4.10-2**. The development of the lots and homes would occur within the lower 5.97 acres of Drainage III. Thus, additional impervious surfaces resulting from the project would bypass the Camille Lane system and drain directly into the Camille Avenue system.

Implementation of the project would also reroute 27.07 acres of Drainage Area I to the Camille Avenue drainage system. As mentioned before, this drainage system was originally sized based on zoning that, at the time, planned for development of single-family homes in the entire 157-acre Drainage Area II. Since much this area is currently zoned as open space, the existing Camille Avenue drainage system is sufficient to carry post-project flows. The remaining 0.83 acres of Drainage Area I would maintain its pre-project flow pattern to the Hemme Avenue drainage system. Refer to **Appendix N** for further discussion of pre-development and post-development site drainage.

As described above, drainage modifications would not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site. This impact would be less than significant.

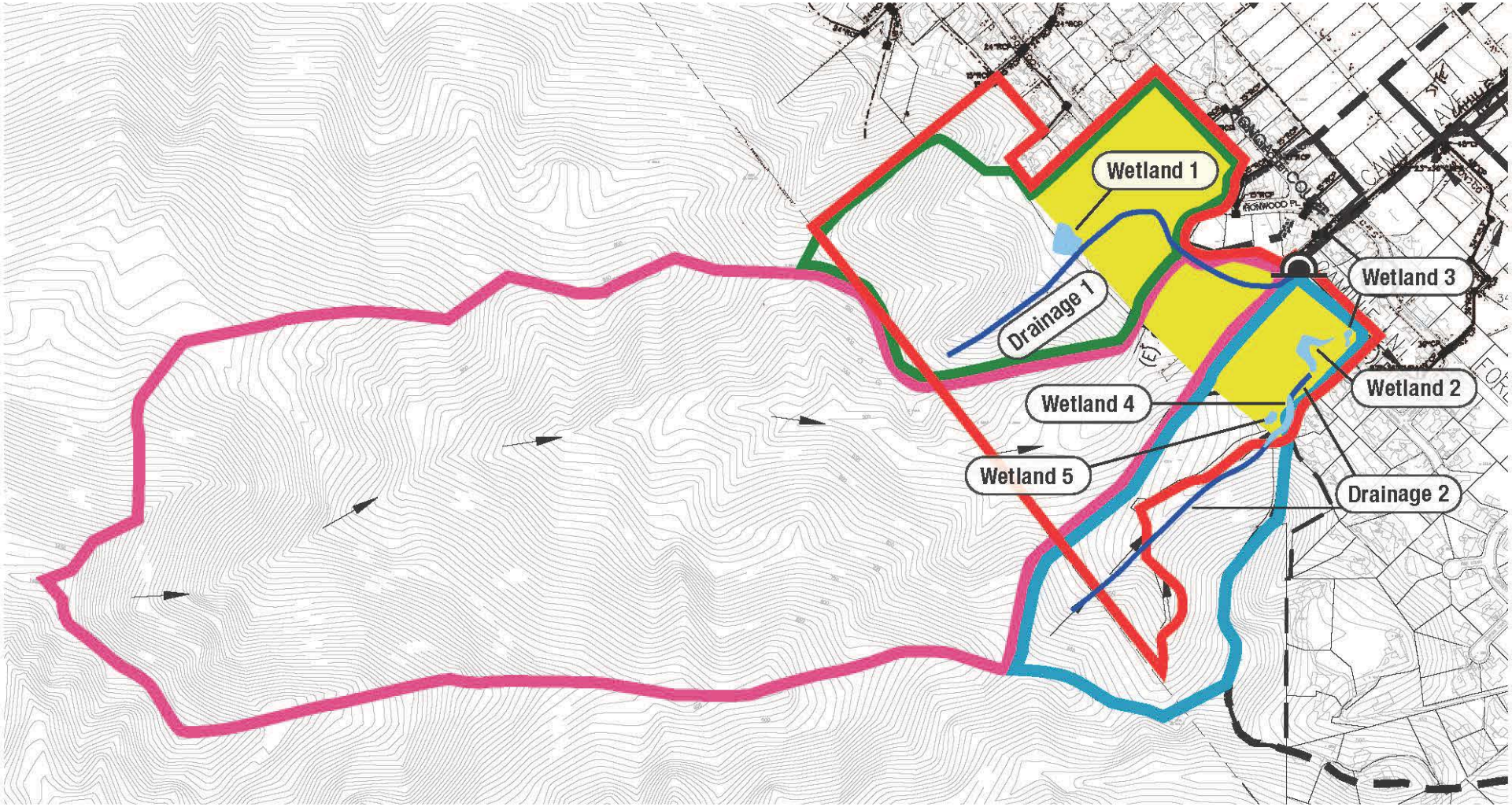
Discussion of Significant Impacts

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?

Impact HYD-1: Project construction activities could substantially alter the existing drainage pattern of the project site in a manner which would result in substantial offsite erosion or siltation (Less than Significant with Mitigation).

For the purposes of this draft environmental impact report, project construction is conservatively assumed to occur over a 30-month period, which includes grading, infrastructure installation (including streets and storm drain facilities), and the construction of the residential homes. However, actual construction of the single-family homes will be market driven, and may extend over a 10-year period.

Construction of the project would involve earthmoving activities such as excavation, grading, soil stockpiling, and filling as a result of site preparation and drainage channel relocation. Approximately 26,000 cubic yards of material would be excavated and balanced onsite. Disturbance of soil during construction activities could result in erosion that could temporarily degrade water quality in the nearby waterways, including the onsite drainages. Prior to the issuance of a grading permit, the Contra Costa County Public Works Department and/or the Contra Costa County Department of Conservation and development shall approve a SWPPP prepared by the project proponent (see **Mitigation Measure BIO-7**). This SWPPP shall comply with current RWQCB guidelines and shall adopt acceptable best management practices (BMPs) for control of sediment and stabilization of erosion in the project area. The SWPPP shall include acceptable BMPs for the protection of water quality during construction activities. In addition, the Preliminary Drainage Study includes an Erosion Control Plan outlining features to slow runoff, increase infiltration, and monitor the quality and efficacy of erosion control measures and throughout the 10-year construction period. With implementation of the SWPPP and Erosion Control Plan, this impact would be less than significant.



Legend

- Development Area
- Project Site
- Drainage Channel
- Wetlands
- Drainage Area I
- Drainage Area II
- Drainage Area III
- Enters Stormwater System
- Direction of Water Flow

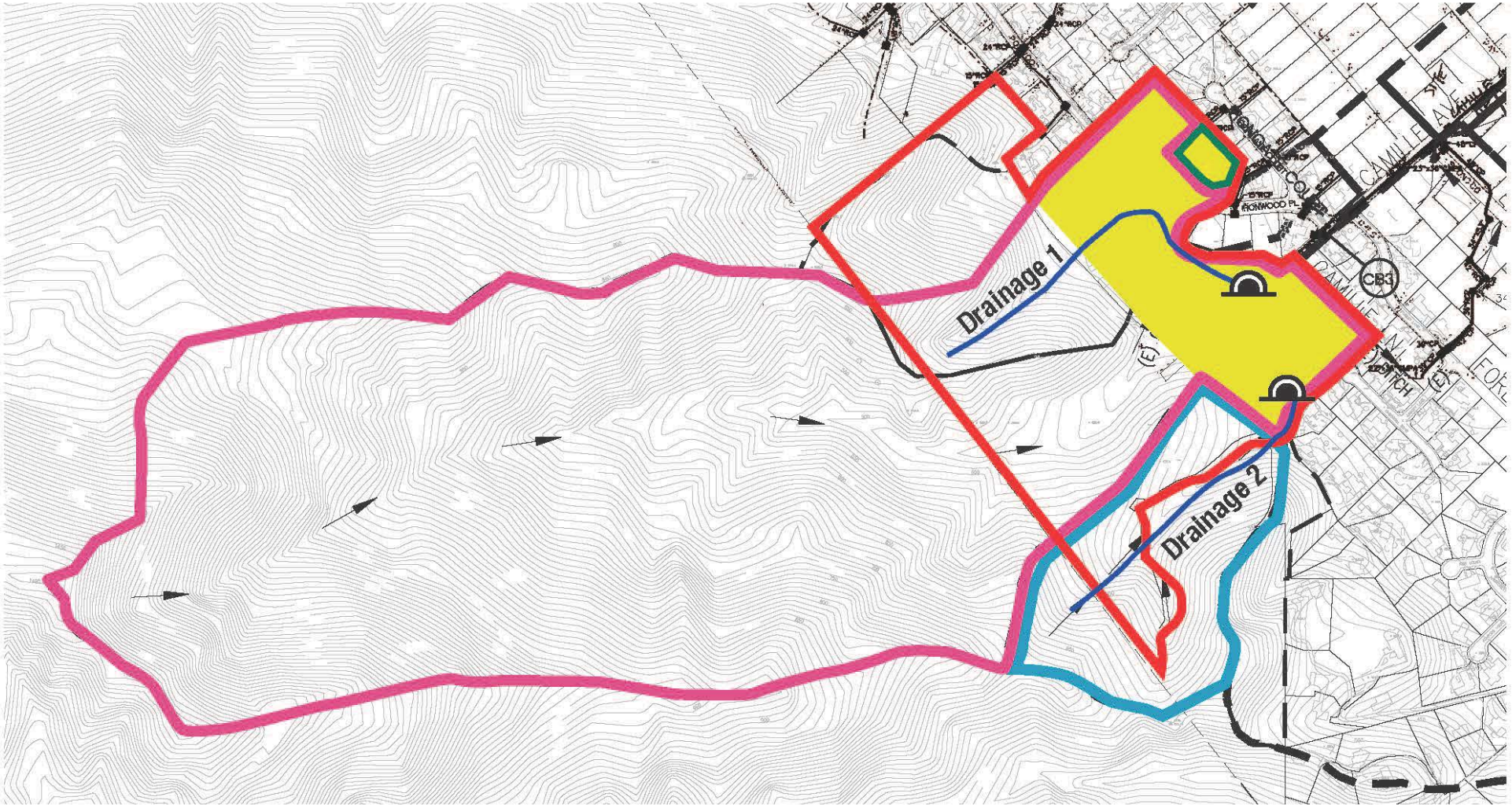
N

0 300 600 900
FEET

Pre-Development Drainage

Figure **4.10-1**

Source: Aliquot, 2016.



Post-Development Drainage

Figure **4.10-2**

Source: Aliquot, 2016.

Would the project otherwise substantially degrade water quality?

Impact HYD-2: Construction activities could substantially degrade water quality (Less than Significant with Mitigation).

Construction

The project would require the construction of roads, driveways, building pads and associated facilities. Construction and grading would remove some existing vegetation, leaving the soil barren and vulnerable to erosion. Eroded soil can be carried as sediment in surface runoff to be deposited in on-site drainages or downstream waterways. The SWPPP and Erosion Control Plan prepared for the project will include BMPs to minimize the potential for sediment input to the nearby waterways. The SWPPP would also outline practices to minimize the contact of fuels, waste products, building materials, and other potential construction period pollutants from surface water. Although the SWPPP would adequately reduce construction-period water quality impacts to a less-than-significant level, application of **Mitigation Measure BIO-6b** and **Mitigation Measure BIO-7** would provide additional procedures to further prevent adverse impacts to water quality.

Operation

Residential developments typically discharge pollutants from vehicles, landscape maintenance, and pest control into the storm drain system. Without proper water treatment, the project could contribute sediments, heavy metals, oils and greases, and pesticides into the on-site drainages or downstream waterways. These pollutants have the potential to degrade the water quality of local receiving waters.

As discussed above, bioretention facilities shall be implemented throughout the project site to catch and filter runoff from impervious surfaces. This proposed drainage system has been designed to comply with NPDES and the County's C.3 requirements. This impact would be less than significant.

As discussed in **Chapter 3.0, Project Description**, project operation will include vegetation management to maintain 100 feet of defensible space to reduce the risk of wildfires. Vegetation management activities include annual mowing, grazing, pruning lower limbs from trees and removing dead vegetation (with mowing permitted only insofar as the 100-foot buffer overlaps private backyards of project residents). The vegetation management activities contemplated for the project do not involve the disturbance of any soils, and would not have any potential to impact site hydrology. Woody debris would be removed from the site, while other detritus from implementation of this measure would remain to compost in place, which would not change run-off coefficients, thus Impacts are therefore deemed less than significant.

4.10.4 CUMULATIVE IMPACTS

The General Plan identified that an increase in urban runoff due to urban development would contribute pollutants and sediments to surface waters such as rivers and creeks.

The discharge of stormwater runoff from new development in California is highly regulated by local, State, and Federal laws specifically to ensure that they do not result in the gradual degradation of water quality. The General Plan includes policies that specifically reinforce these regulations by establishing the County's active role in water quality programs. Point sources of pollution are required to be identified and controlled in order to protect adopted beneficial uses of water. Implementation of these policies occur as part of the development review and construction permitting process.

The project hydrologic analysis, which assumes buildout of the drainage basin, demonstrates the adequacy of the downstream drainage infrastructure to carry the design discharge, thus complying with the County Ordinance, Title-9, Section 914-2.004 Offsite Collect and Convey. Consistent with the above, the project's drainage system would comply with the hydromodification criteria developed by the San Francisco Bay Region Municipal Regional Stormwater NPDES Permit (MRP), where such criteria was developed to mitigate potential cumulative impacts from increased flow from new development. Accordingly, the project will not make any considerable contribution to a significant cumulative impact. Separately, each of the projects considered under the cumulative scenario incorporate storm water control features that would retain storm water on site during rain events, thereby reducing the quantity and improving the quality of offsite flow to San Ramon Creek. These enhancements are in conformance with the County's C.3 guidelines. Thus, no cumulative impact would occur.

4.10.5 REFERENCES

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