## 3.2 Hydrology and Water Quality

The following section provides a Project-level analysis of the potential impacts related to hydrology and water quality that may result from implementation of the proposed Project. The potential impacts of the proposed Project related to hydrology and water quality are evaluated in detail in the Otay Ranch Resort Village Drainage Study and the Major Stormwater Management Plan (SWMP), which includes a Hydromodification Management Plan for the Project and portions of Otay Lakes Road that will be widened and realigned by the Project. Copies of the two reports are provided as **Appendix C-13 and C-14**, respectively, to this EIR.

The Otay Ranch PEIR, adopted in 1993, provided a program-level analysis of the existing conditions and potential impacts related to hydrology and water quality for the entire Otay Ranch area, including the Project site. The Otay Ranch PEIR included a Water Resources and Water Quality section and identified potential hydrologic impacts from inundation of Project features, changes in surface water flow rates, surface water quality, and groundwater quantity and quality. The PEIR identified as mitigation the preparation of a comprehensive drainage master plan with the first development project and preparation of detailed hydrologic and hydraulic studies with each phase of development. Implementation of an urban runoff system was required to prevent dry weather urban runoff from impacting the Otay Lakes. Impacts to the groundwater from a decrease in recharge from developed areas within the 23,088-acre Otay Ranch were determined to be partially mitigated by utilizing unlined natural channels and water quality basins wherever possible. This recharge system was intended to partially replace the Project impact of a 25 percent reduction in runoff being diverted from the Otay Lakes. The PEIR concluded that the potential hydrology and water quality impacts could be mitigated to less-than-significant levels with incorporation of site-specific mitigation measures into the design and construction of each project within Otay Ranch. The Otay Ranch PEIR is incorporated by reference in this EIR, and is available for public inspection and review at the County of San Diego, PDS, 5510 Overland Ave., San Diego, California.

### 3.2.1 Existing Conditions

#### 3.2.1.1 *Hydrologic Setting*

The Project site is located in the southwestern portion of the San Diego Basin. The San Diego Basin is divided into 11 hydrologic units and 54 hydrologic subunits, which are based primarily on surface water drainage basins. The Project site is located within the Savage Hydrologic Subarea, Dulzura Hydrologic Area, and Otay Hydrologic Unit of the San Diego Hydrologic Basin (Basin No. 910.31).

The Project site is currently undeveloped. The existing topography of the Project site is characterized by steep hills, incised canyons, and mostly natural vegetation, dominated by coastal sage scrub with substantial amounts of grassland and chaparral. Surface drainage of the Project site is to the south-southwest, toward Lower Otay Lake. The area analyzed by the Project's Drainage Study and SWMP includes the Project site and an approximately 4.2-mile

section of Otay Lakes Road that will be widened and realigned by the proposed Project. Runoff from the site and drainages upstream of Otay Lakes Road drains via 23[1] existing culverts under Otay Lakes Road to Lower Otay Lake. 16 of the 23 existing culverts are currently undersized for existing drainage conditions, which would result in potential roadway overtopping during a 100-year storm event. Accordingly, the existing culverts require upsizing to prevent roadway overtopping. Currently, no development exists in off-site areas that drain through the Project site or into culverts affected by the widening and realignment of Otay Lakes Road as a result of the Project.

Lower Otay Lake serves as both a drinking water reservoir approximately 50,000 acre-feet in volume (which is owned and operated by the City of San Diego Water Department) and the southern terminus of the San Diego County Water Authority (SDCWA) Second San Diego Aqueduct (which carries imported water to the San Diego area). Thus, water in Lower Otay Lake is a blend of water from the local watershed and water imported from the Colorado River and the California State Water Project. As discussed below, the City of San Diego has prepared Source Water Protection Guidelines (SWPG) to guide new development activities on properties that drain into reservoirs such as Lower Otay Lake.

#### 3.2.1.2 *Water Quality Setting*

The beneficial uses identified in the RWQCB Water Quality Plan for Lower Otay Lake and upstream unnamed tributaries include municipal and domestic supply, agricultural supply, industrial process supply, industrial service supply, recreational uses, cold and warm freshwater habitat, wildlife habitat, biological habitats of special significance (unnamed tributaries only), and rare species habitats (unnamed tributaries only).

The Project site and the associated watershed were compared to the current published federal Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segment (Section 303[d] List), which lists the surface waters that do not meet applicable water quality standards, required pursuant to Section 303(d) of the CWA. Lower Otay Lake has been identified on the Section 303(d) List as sensitive to color, iron, manganese, nitrogen, ammonia, and high pH. As a result, primary pollutants of concern consist of heavy metals and nutrients. Secondary pollutants of concern include sediment, organic compounds, trash and debris, oxygen-demanding substances, viruses and bacteria, oil and grease, and pesticides.

Additionally, under the City of San Diego SWPG, the highest priority pollutants of concern include nutrients (nitrogen and phosphorus), total organic carbon (TOC) derived from excess nutrients, decaying vegetation, algae growth, metabolic activities of living organisms or chemicals, and total dissolved solids (TDS). Primary sources for TDS in the drainage basin are residential development to the west of the Reservoir and agricultural runoff and leaching of soil contamination. The most common chemical constituents are calcium, phosphates, nitrates,

[1] A 24th culvert, (culvert #3), exists off-site underneath Otay Lakes Road to the west of the Project site. The culvert is a set of twin box culverts running underneath Otay Lakes Road that conveys flows from Upper Otay Lake to Lower Otay Lake. Although this culvert is not affected by drainage from the Project site, it would require lengthening as part of the widening of Otay Lakes Road in that area.

sodium, potassium, and chloride. For the purpose of this analysis, the adverse impact from TDS is also referred to as "salt loading".

### 3.2.1.3 *Regulatory Setting*

**Federal Regulations**

**FEMA Flood Plain Management Standards**

The Federal Emergency Management Agency (FEMA) is the primary federal agency with the responsibility of administering programs and coordinating with communities to establish effective flood plain management standards. FEMA is responsible for developing the Flood Insurance Rate Map (FIRM), which delineates Special Flood Hazard Areas and flood risk zones. State and local agencies are responsible for implementing regulations, ordinances, and policies in compliance with FEMA requirements to address floodplain management issues.

**Federal Clean Water Act**

The Federal Water Pollution Control Act, commonly known as the Clean Water Act (CWA), was adopted in 1972 and established basic guidelines for regulating discharges of pollutants into waters of the United States. The CWA set up a system of water quality standards, discharge limitations, and permits to protect the designated beneficial uses of water resources. The CWA also requires that states adopt water quality standards to protect public health or welfare, enhance the quality of water, and serve the purposes of the CWA.

The CWA was amended in 1987, which established the NPDES permit program, authorized by Section 402 of the CWA. Other relevant provisions of the CWA include Section 401, which requires that applicants for federal permits relating to the construction or operation of a facility that may result in the discharge of a pollutant obtain certification of those activities from the state in which the discharge originates. Section 404 of the CWA establishes a permitting program to regulate the discharge of dredged or filled material into waters of the United States, which is administered by the USACE and enforced by USEPA. In California, USEPA has authorized the State Water Resources Control Board (SWRCB) to implement the NPDES program.

**Federal Antidegradation Policy**

The federal antidegradation policy has been in existence since 1968. The policy protects existing uses, water quality, and national water resources. It directs states to adopt a statewide policy that includes the following primary provisions:

- maintain and protect existing instream uses and the water quality necessary to protect those uses;
- where existing water quality is better than necessary to support fishing and swimming conditions, maintain and protect water quality unless the state finds that allowing lower water quality is necessary for important local economic or social development; and

- where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, maintain and protect that water quality.

## State Regulations

### Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) was established to create a regulatory program to protect water quality and beneficial uses of the state's waters. Accordingly, the Act established the responsibilities and authorities of the SWRCB and the nine RWQCBs.

### State Water Resources Control Board

The SWRCB issues stormwater permits in accordance with the NPDES program, which requires regulated entities to obtain coverage under an NPDES stormwater permit and implement a storm water pollution prevention plan (SWPPP) or a storm water management plan (SWMP), and to utilize Best Management Practices (BMPs) to reduce or prevent the discharge of pollutants into receiving waters, as described further below.

### San Diego Regional Water Quality Control Board

The San Diego RWQCB is responsible for implementing and enforcing the laws and regulations regarding water quality in the San Diego region. With regard to storm water runoff, RWQCB requires compliance with RWQCB regulations and the applicable provisions of the federal CWA, including NPDES criteria and permitting. The RWQCB San Diego Basin Plan is the Water Quality Control Plan for the San Diego Basin and establishes the beneficial uses and water quality objectives for surface and groundwater resources. The beneficial uses for Lower Otay Lake are described above in Section 3.2.1.2.

The NPDES Storm Water Program addresses non-agricultural sources of storm water runoff that adversely affect the quality of the Country's waters. Under the NPDES Program, regulated entities must obtain coverage under an NPDES storm water permit and implement a SWPPP or a SWMP, and must utilize BMPs to reduce or prevent the discharge of pollutants into receiving waters. NPDES storm water permit regulations generally cover the following classes of storm water dischargers: operators of municipal separate storm sewer systems (MS4), operators of certain industrial facilities, and operators of construction activities that disturb 1 or more acre of land. Implementation of the proposed Project requires conformance with the NPDES Storm Water Program's Construction General Permit and the Municipal Permit, as defined and described below.

*Construction General Permit*

Dischargers whose projects disturb 1 or more acres of soil, or less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain

coverage under the SWRCB's Order 2012-0006-DWQ (amending Order 2009-0009-DWQ as amended by 2010-0014-DWQ), the Construction General Permit (SWRCB 2012). Construction and demolition activities subject to this permit include clearing, grading, grubbing, and excavation, or any other activity that results in a land disturbance equal to or greater than 1 acre.

Permit applicants are required to submit a Notice of Intent to the SWRCB and to prepare a SWPPP. The SWPPP must identify BMPs that are to be implemented to reduce construction impacts on receiving water quality based on potential pollutants. The SWPPP also must include descriptions of the BMPs to reduce pollutants in storm water discharges after all construction phases are completed at a site (post-construction BMPs).

The Construction General Permit includes several additional requirements (as compared to the previous Construction General Permit, 2009-0009-DWQ), including risk-level assessment for construction sites, a storm water effluent monitoring and reporting program, rain event action plans, and numeric action levels for pH and turbidity.

*San Diego County Municipal Storm Water Permit (R9-2013-0001)*

Under Phase I of its storm water program, USEPA published NPDES permit application requirements for municipal storm water discharges for municipalities that own and operate separate storm drain systems serving populations of 100,000 or more, or that contribute significant pollutants to waters of the U.S. The proposed project is subject to the San Diego Municipal Storm Water NPDES Permit (Municipal Permit) under Order R9-2013-0001. The proposed project design would have to comply with requirements and measures outlined in this municipal permit to minimize impacts to water quality and runoff hydrology for the construction and operational phases of the proposed project life.

The Municipal Permit requires that each copermittee covered under the permit (i.e., a variety from San Diego, Orange, and Riverside counties) prepare Water Quality Improvement Plans (WQIPs), establish action levels for non-storm water and storm water pollutants, monitor and assess program requirements, and update Jurisdictional Urban Runoff Management Plans (JURMPs). JURMPs address water pollution management for construction activities, development planning, and existing development management.

The local jurisdictions within the San Diego region regulate water quality through a variety of ordinances and guidelines, including but not limited to, jurisdictional urban runoff management programs and storm water standards. In accordance with the provisions of the Municipal Permit, the County of San Diego developed a Standard Urban Storm Water Mitigation Plan (SUSMP) (County of San Diego 2011a). The SUSMP identifies mitigation strategies required to protect storm water quality for new development and significant redevelopment within the San Diego region. Development within each respective County of San Diego municipality is subject to each respective SUSMP, accordingly.

## Local Regulations and Standards

### San Diego County General Plan

The Safety Element of the San Diego County General Plan includes goals and policies regarding flood hazards to minimize personal injury and property damage losses resulting from flood events; and to maintain adequate capacity in floodways and floodplains to accommodate flood events. Policy LU-6.5, Sustainable Stormwater Management, in the Land Use Element states: "Ensure that development minimizes the use of impervious surfaces and incorporates other Low Impact Development techniques as well as a combination of site design, source control, and stormwater best management practices, where applicable and consistent with the County's Low Impact Development (LID) Handbook."

### County of San Diego Flood Damage Prevention Ordinance

The Flood Damage Prevention Ordinance (County Code of Regulatory Ordinances Section 811.101-811.104) identifies Special Flood Hazard Areas throughout the County as having a special flood or flood-related erosion/sedimentation hazard and as being shown on a FIRM or on a County floodplain map. The ordinance also defines methods to reduce flood losses. By complying with the requirements of this ordinance, a project is considered to be in compliance with FEMA regulations.

### County of San Diego Grading Ordinance

The Grading Ordinance (County Code of Regulatory Ordinances sections 87.601-87.608) combines regulations affecting grading and land clearing with activities affecting watercourses.

### County of San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance

The San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance (WPO) defines the storm water management requirements that are legally enforceable by the County in the unincorporated areas. As referenced in Section 67.810 of the WPO, the County prepared a detailed Storm Water Standards Manual (SSM), which is a guidance document addressing the use of pollution prevention practices and BMPs for specific activities or facilities. The WPO also addresses connections for, and disposal of, storm water, and incorporates the County's LID Handbook, which is a guidance document that provides a comprehensive list of LID planning and storm water management techniques that emphasize storm water infiltration, conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic conditions.

### County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects

The County developed the Standard Urban Storm Water Mitigation Plan (SUSMP) for proposed land development and public improvement projects. The SUSMP is mandated for significant new development and redevelopment projects, including "Priority Projects," which are defined in the NPDES Municipal Permit to include residential development of ten or more dwelling units or commercial development greater than 1 acre. The proposed Project is classified as a Priority Project and, therefore, is subject to the SUSMP requirement to prepare a Major Stormwater Management Plan, which has been prepared for the proposed Project and is included as **Appendix C-14** of this EIR.

The County's SUSMP is focused on improving the quality of stormwater runoff through BMPs for project design and related post-construction activities. The SUSMP requires a project applicant to develop and submit a SWMP that complies with the requirements of the WPO and the SSM. The SWMP serves as the basis for long-term water quality improvements and the SUSMP requires that Priority Projects be designed to minimize, to the maximum extent practicable, the introduction of pollutants and creation of conditions that may result in significant impacts generated from site runoff to the stormwater conveyance system. Priority Projects also must control post-development peak stormwater runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion and to protect stream habitat. Thus, the proposed Project must implement site design, source control, and treatment control BMPs to address both water quality and hydrologic impacts.

### San Diego County Hydrology Manual

The San Diego County Hydrology Manual (County of San Diego 2003) provides uniform procedures for analyzing flood and stormwater conditions in the County. Specific elements of these procedures include methods to estimate storm flow peaks, volumes, and time distributions. These data are used in the design of stormwater management facilities to ensure appropriate dimensions and capacity (typically 100-year storm flow volumes), pursuant to applicable requirements in the San Diego County Drainage Design Manual (County of San Diego 2005).

### San Diego County Hydromodification Management Plan

San Diego Regional Water Board Order R9-2007-0001 requires that hydromodification and its influence on water quality be addressed through the implementation of a Hydromodification Management Plan (HMP) to manage increases in runoff discharge rates and durations (10% of Q2 to Q10 rainfall events) from priority development projects. The HMP is required to identify increased frequencies and durations of runoff that could 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 must establish standards to control flows and avoid erosion. Supporting analyses must be based on continuous hydrologic simulation modeling. Consistent with this directive, the County has prepared the San Diego County HMP.

The Final HMP (County of San Diego 2011c) exempts certain project discharges to Lower Otay Lake from the County's hydromodification management requirements. However, this exemption only applies to outfalls with a proposed invert elevation below the lake's high water level of 490.7 feet AMSL at the spillway with gates closed. Based on this threshold, the Project has nine (9) Points of Compliance requiring hydromodification analysis. Four outfall locations along Otay Lakes Road (culverts 1a, 1b, 19, and 20), one along Wueste Road, and four internal outfalls along Strada Piazza, proposed by the Project are subject to hydromodification analysis since they are designed with culvert outlet elevations above this level.

**City of San Diego Source Water Protection Guidelines**

The City of San Diego, which owns and operates Lower Otay Lake as a public water supply reservoir, has conditioned development projects upstream of the reservoir to protect it from stormwater pollution through a non-degradation policy with regard to TDS. The City also has developed Source Water Protection Guidelines to guide future activities, including development projects, in San Diego County watersheds that drain into drinking water reservoirs. The guidelines provide a simplified BMP selection process to ensure that preferred source water protection BMPs are considered. Although use of these guidelines is voluntary, the water quality protection principles included in the guidelines are intended to ensure project consistency with state and local stormwater permit requirements.

**Otay River Watershed Management Plan**

The Otay River Watershed Management Plan (Otay River Watershed Management Plan Joint Exercise of Powers Agreement Public Agencies 2006) was prepared pursuant to a Joint Exercise of Powers Agreement between the County, the cities of San Diego, Chula Vista, and Imperial Beach, and the San Diego Unified Port District. The purpose of the plan is to provide a comprehensive framework management plan to guide on-going watershed uses; source water protection; and other resource protection, enhancement, and restoration activities. To achieve that purpose, the plan does the following: (1) characterizes the watershed's various natural resources and land uses; (2) identifies key goals; (3) assesses and prioritizes threats to existing beneficial uses and natural resources; (4) identifies strategies for the protection, enhancement, and restoration of beneficial uses and natural resources in the watershed, including source water protection and a water quality monitoring strategy; (5) provides adaptive management strategies and objectives to monitor and evaluate the effectiveness of the strategies and proposes potential remedial actions; and (6) prepares the plan so that it can be easily updated to reflect changes in physical, biological, chemical, land use, and regulatory conditions.

The Otay River Watershed Management Plan is not a regulatory document. Rather, it is a policy document intended to be consistent with the regulatory requirements under the NPDES Municipal Permit, applicable local general plans, and local resource plans and programs. As such, it is designed to serve as a programmatic advisory document for decision makers to use as a tool. The strategies outlined in the plan are only recommendations that may need to be refined by each jurisdiction.

**San Diego Integrated Regional Water Management (IRWM) Plan, including Appendix 7-B (Integrated Flood Management Planning Study)**

The San Diego IRWM Plan was prepared under the direction of a Regional Water Management Group consisting of the San Diego County Water Authority, the County of San Diego, and the City of San Diego. The IRWM Plan builds on local water and regional management plans within the San Diego Region and is aimed at developing long-term water supply reliability, improving water quality, and protecting natural resources. The Statewide IRWM Program is supported by bond funding provided by the California Department of Water Resources (DWR) to fund competitive grants for projects that improve water resources management.

The goals of the IRWM Plan include the following:

- Improve the reliability and sustainability of regional water supplies;
- Protect and enhance water quality;
- Protect and enhance our watersheds and natural resources, and
- Promote and support sustainable integrated water resource management.

Appendix 7-B of the IRWM Plan, Integrated Flood Management Planning, is a guidance document aimed to facilitate an integrated water resources approach to flood management. The planning document defines general applicable strategies and approaches, as well as provides planning level tools, to guide flood management decision making on a watershed basis. The focus of integrated planning is a balance between community flood management needs with environmental constraints and watershed resources to ensure an acceptable solution with the flexibility to adapt to future changes.

**Construction Dewatering Permit**

Construction dewatering discharges must be permitted either by the San Diego RWQCB under the general Order 2001-96 (NPDES No. CAG919002) for construction dewatering discharge to surface waters or authorized to discharge to local publicly owned treatment works (i.e., industrial or sanitary sewer system of municipal wastewater treatment plants). Discharge via either of these mechanisms must meet applicable water quality objectives, constituent limitations, and pretreatment requirements.

### 3.2.2 Analysis of Project Effects and Determination as to Significance

Guidelines for the Determination of Significance

Hydrology

A project will generally be considered to have a significant effect if it proposes any of the following, absent specific evidence to the contrary. Conversely, if a project does not propose any of the following, it will generally not be considered to have a significant effect on hydrology, absent specific evidence of such effect:

- The project will 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 that would result in substantial erosion or siltation on- or off-site.
- The project will increase water surface elevation in a watercourse within a watershed equal to or greater than 1 square mile by 1 foot or more in height, and, in the case of the San Luis Rey River, San Dieguito River, San Diego River, Sweetwater River, and Otay River, 2/10 of a foot or more in height.
- The project will result in increased velocities and peak flow rates exiting the Project site that would cause flooding downstream or exceed the stormwater drainage system capacity serving the site.
- The project will result in placing housing, habitable structures, or unanchored impediments to flow in a 100-year floodplain area or other special flood hazard area, as shown on a FIRM, a County Flood Plain Map, or County Alluvial Fan Map, which would subsequently endanger health, safety, and property due to flooding.
- The project will place structures within a 100-year flood hazard or alter the floodway in a manner that would redirect or impede flow resulting in any of the following:
    - Alter the Lines of Inundation resulting in the placement of other housing in a 100-year flood hazard; or
    - Increase water surface elevation in a watercourse with a watershed equal to or greater than 1 square mile by 1 foot or more in height and, in the case of the San Luis Rey River, San Dieguito River, San Diego River, Sweetwater River, and Otay River, 2/10 of a foot or more in height.

Rationale for Selection of Guidelines

The significance guidelines for hydrology are from the County of San Diego Guidelines for Determining Significance for Hydrology, dated July 30, 2007.

Water Quality

A project will generally be considered to have a significant effect if it proposes any of the following, absent specific evidence to the contrary. Conversely, if a project does not propose any of the following, it will generally not be considered to have a significant effect on water quality, absent specific evidence of such effect:

- The project is a development project, as defined in the WPO, County of San Diego Code of Regulatory Ordinances (Regulatory Ordinances) Section 67.803, and does not comply with the standards set forth in the County SSM or the Additional Requirements for Land Disturbance Activities set forth in the WPO, Regulatory Ordinances Section 67.811.
- The project would drain to a tributary of an impaired water body listed on the Clean Water Act Section 303(d) List, and will contribute substantial additional pollutant(s) for which the receiving water body is already impaired.

- The project would drain to a tributary of a drinking water reservoir and will contribute substantially more pollutant(s) than would normally run off from the Project site under natural conditions.
- The project will contribute pollution in excess of that allowed by applicable state or local water quality objectives or will cause or contribute to the degradation of beneficial uses.
- The project does not conform to applicable federal, state, or local "Clean Water" statutes or regulations including, but not limited to, the federal Water Pollution Control Act, California Porter-Cologne Water Quality Control Act, and the County WPO.

Rationale for Selection of Guidelines

The significance guidelines for water quality identified above are based on the County of San Diego Guidelines for Determining Significance for Surface Water Quality, dated July 30, 2007.

### 3.2.2.1 *Hydrology*

Guideline for the Determination of Significance

A significant impact to hydrology would occur if the project would do the following:

1. 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 that would result in substantial erosion or siltation on- or off-site.

Analysis

Development of the Project, including the widening and realignment of an approximately 4.2-mile section of Otay Lakes Road from Lake Crest Drive in the City of Chula Vista to the Project's eastern boundary, would not divert drainage to or away from Lower Otay Lake, however, it would result in alterations to drainage patterns and drainage areas as compared to the existing drainage patterns on the Project site and along Otay Lakes Road as shown in **Figure 3.2-1** (Existing) and **Figure 3.2-2** (Proposed).

Under existing conditions, all runoff from the proposed Project drains to Lower Otay Lake via 23 existing culverts located under Otay Lakes Road. Some of the existing culverts are undersized, resulting in overtopping of Otay Lakes Road during peak runoff events. A 24$^{th}$ culvert, a set of twin box culverts denoted as Crossing #3, exists under Otay Lakes Road to the west of the Project site that would be upgraded by the widening and realignment of Otay Lakes Road, however the drainage area for this culvert would not be affected by these road improvements or development of the Project site. The locations of the 24 culverts can be seen in **Figure 3.2-3.**

Development of the Project would internally alter the course of drainage areas, but not in a manner that would result in a substantial increase in erosion or siltation on- or off-site. The Project would consolidate 23 existing culverts under Otay Lakes Road into 14 new upgraded culverts sized to convey the 100-year storm event and extend an existing set of twin box culverts

(Crossing #3) with the widening of Otay Lakes Road. The locations of the 14 new upgraded culverts and the set of extended twin box culverts (Crossing #3) can be seen in **Figure 3.2-4**. Of the 14 culverts in the proposed condition, 10 culverts would discharge below the high water surface elevation of 490.7 feet for the Reservoir. Therefore, the erosion potential at these submerged points would be minimal to non-existent. Out of the 795 total acres of developed/disturbed area for the Project, runoff from approximately 771.3 acres (97%) would be tributary to these 10 culverts. In other words, 97% of the Project's disturbed/developed area would be effectively discharging treated runoff directly into Lower Otay Lake at these 10 culverts which are at the high water mark of the Reservoir. Of the 771.3 acres of the Project's development runoff, 659.9 acres would be treated in bioretention basins, 63.8 acres would be treated at a storm drain inlet treatment control device (e.g., Filterra Unit or equivalent inlet treatment device), and the remaining 47.5 acres would be "self-treating" irrigated landscaped slopes with typical manufactured slope drainage control.

The remaining 23.7 acres (3%) of the Project's developed/disturbed area would contribute runoff to one of the four culverts along Otay Lakes Road (1a, 1b, 19, and 20) that are above Lake's high water mark and/or culverts internal to the Project site and, therefore, were analyzed for the potential to create downstream erosion. In addition to the four culverts along Otay Lakes Road, four additional culverts proposed along Strada Piazza (internal to the Project site), and an off-site area along the future realignment of Wueste Road—nine "Points of Compliance" (POCs) in total—have outlets that are above the reservoir's high water surface elevation. As such, these areas were analyzed to comply with hydromofication requirements. The locations of these areas are shown in **Figure 3.2-5A** and **3.2-5B**.

For these nine POCs, the San Diego Hydrology Model (SDHM) was used, along with requirements within the County of San Diego Final HMP, to run a continuous simulation model of the pre-Project and post-Project conditions. The post-Project SDHM model is required to demonstrate that post-Project discharge rates and durations at each Point of Compliance (POC) will not exceed the pre-Project discharge rates and durations by more than 10 percent for the range of storm events beginning with a 2-year event and up to a 10-year event.

The drainage areas that contribute runoff to culverts 19 and 20, the remaining two of the four culverts under Strada Piazza, and the area at Wueste Road (POC's 1, 2, 5, 6, and 9), all decrease in size as a result of the proposed Project improvements and, therefore, reduce the erosion potential at these outfalls. Hydromodification analysis conducted for these five POCs showed that the proposed frequency and duration curves would not exceed the existing conditions and, therefore, hydromodification measures are not required for these areas of the Project.

In the remaining four locations (1a and 1b along Otay Lakes Road and two of the culverts under the Project's internal backbone street "Strada Piazza", POCs 3, 4, 7, and 8, respectively), comprising approximately 11.5 acres in total, the Project would increase the impervious surface of the drainage area, and, therefore, would be subject to hydromodification requirements. Appropriate water quality/hydromodification basins in the form of vegetated roadside bioretention swales with flow-control outlet devices have been designed for these areas which would prevent erosion from occurring downstream of the outfalls for these basins.

The Project's bioretention basins, vegetated roadside bioretention swales, and Filterra Units constitute the Project's storm water capture and treatment BMPs (***Treatment Control BMPs***). The locations of these BMPs can be seen in **Figure 3.2-6**. Internally, the Project's proposed drainage system and storm water capture and treatment BMPs for onsite areas and the improvements to Otay Lakes Road are designed to prevent a substantial increase in erosion on-site. Under the developed condition, the Project's streets are designed to drain directly into the Project's storm drain system. The storm drain system is designed to capture runoff from the developed portions of the Project area, including graded homesites/building pads and impervious surfaces such as rooftops, roads, and parking lots and direct that runoff into the Project's storm water capture and treatment BMPs. Prior to discharge, most of the Project's runoff is directed into bioretention basins and the remainder of the Project's runoff is directed into vegetated roadside swales or storm drain inlet treatment control devices (e.g., Filterra Units or equivalent inlet treatment devices) prior to discharge into the Reservoir or into natural drainages feeding the Reservoir. By directing runoff from developed areas directly into the Project storm drain system and capturing and treating that runoff in storm water BMPs prior to discharge, the proposed Project will prevent any significant increase in erosion on-site.

As discussed above, a small percentage of the Project site and portions of Otay Lakes Road would discharge treated storm water runoff above the high water mark of the reservoir and are, therefore, subject to hydromofication requirements. Runoff at these locations would be directed into vegetated roadside swales for treatment and hydromodification attenuation. The vegetated roadside swales will be outfitted with flow control devices to control the rate of discharge out of the basin for those higher frequency storms subject to hydromodification requirements (10% of Q2 up to Q10) to prevent the downstream erosion and scouring that tends to occur without hydromodification attenuation upstream during these storm events. The outlet devices will ensure that post-development flows will not exceed pre-development flows for those higher frequency storms, thereby preventing downstream erosion and scouring.

The treatment and detention of storm water runoff by the Project would ensure that flows from developed areas, including those widened and realigned portions of Otay Lakes Road, receive pollutant treatment and removal and, where applicable, hydromodification attenuation before discharging runoff into onsite and offsite drainages and ultimately into Lower Otay Lake. The Project's storm water treatment system would also trap any sediment, trash, and debris in the runoff from the developed areas, thereby preventing these pollutants from entering Lower Otay Lake. Finally, it is important to note that runoff from the 4.2-mile section of Otay Lakes Road to be widened and realigned will be subject to water quality treatment in vegetated roadside swales and storm drain treatment control devices (e.g., Filterra Units). Currently, runoff from the road flows directly into Lower Otay Lake or nearby drainages without any treatment or hydromodification attenuation. Thus, the proposed Project would result in a substantial decrease in the amount of pollutants entering the Reservoir today in runoff from the existing Otay Lakes Road.

While the proposed Project would alter the existing drainage pattern of the Project site and certain offsite areas affected by the widening and realignment of Otay Lakes Road, runoff from 97% of the Project's developed/disturbed area will be discharged below the high water mark of the Reservoir, thereby minimizing any potential to cause erosion off-site, and runoff from those

four areas of the Project that would be discharged above the high water mark of the Reservoir would be subject to hydromodification attenuation, thereby preventing any increased in erosion on- or off-site at these locations. The Project's drainage system and storm water capture and treatment system (BMPs) are designed to prevent any significant increase in erosion on-site.

As is the case with erosion potential, the Project is also designed to prevent a substantial increase in siltation on- or off-site. As stated above, the Project's storm drain system would isolate and direct runoff into the Project's water quality basins (bioretention basins and vegetated roadside swales) or, in some cases, storm drain inlet treatment devices (e.g., Filterra Units or equivalent inlet treatment devices). The Project's water quality basins and storm drain inlet treatment devices are designed to trap and remove sediment in runoff from the developed areas of the Project.

In most cases, natural runoff from the undeveloped areas of the Project site would continue to drain directly to Lower Otay Lake and would not mix with untreated runoff from the developed areas until downstream of the proposed basins. In some cases however, to avoid duplication of storm drain piping, runoff from contributing natural areas upstream of developed areas, comprising approximately 338 acres in total, would be collected by the Project's storm drain system and directed to a bioretention basin with Project runoff. In such cases, the Project's proposed basins are designed to be large enough to treat the Project runoff as well as the additional volume of runoff from the contributing natural areas. Accordingly, runoff from these natural areas draining into the basins would undergo sediment removal prior to discharge into Lower Otay Lake, providing an additional benefit to the Reservoir. According to San Diego County SUSMP (Sept. 2012), water quality basins (bioretention basins and vegetated roadside swales) have a high pollutant removal efficiency for coarse and fine sediment/particles and Filterra Units have a high pollutant removal efficiency for coarse sediments and a medium pollutant removal efficiency for fine sediment/particles. Thus, the incorporation of bioretention basins, vegetated roadside swales, and Filterra Units (or equivalent inlet treatment control device) to capture and treat runoff from the developed areas as well as runoff from some natural areas would prevent any substantial increase in siltation on- or off-site and ultimately into Lower Otay Lake.

It is important to note that, with the reduction in the number of culverts, peak storm flows at individual culverts would increase, however the internal diversion between the culverts is not significant because all proposed culverts would be sized to safely convey the 100-year peak storm flows with the Project in its developed state. Rip-rap improvements would be required at all culvert discharges as a standard condition of development, further reducing the erosion potential at the outfall of these structures. The locations of the new upsized culverts are shown on **Figure 3.2-4**. **Table 3.2-2** shows the 100-year peak flow discharge velocities at the culverts under the existing condition and with full development of the proposed Project and lists the existing and proposed Project culvert sizes needed to accommodate the increased volume of runoff from the Project.

As shown in **Table 3.2-1**, when all of the individual post-development peak flows are combined, the Project would increase 100-year peak flow by an estimated 617 cubic feet per second (cfs) from approximately 2,900 cfs in the pre-development condition to 3,517 cfs in the post-

development condition. In addition, alterations to the internal drainage pattern would result from development of the Project site through the conversion of natural surfaces to impervious surfaces and through activities such as grading, excavation, and construction. However, the proposed Project would not result in a change to the overall drainage area draining into Lower Otay Lake and many potentially erodible reaches of intermittent creeks would be reduced as a consequence of development of the Project. Therefore, some erosion that may be taking place under existing conditions would not occur in post-development conditions.

The proposed Project would also incorporate design considerations, such as construction and post-construction BMPs, as detailed in the SWMP prepared for the proposed Project and as discussed further below, which would avoid or reduce erosion and sedimentation associated with the increase in stormwater runoff.

In summary, the proposed Project would not substantially alter the existing drainage pattern of the site or the area in manner that would cause substantial erosion or siltation on- or off-site. The proposed Project would result in alterations to the internal drainage pattern of the Project site or portions of Otay Lakes Road to widened and realigned that have the potential to result in erosion, however, as discussed above, 97% of the Project's developed/disturbed areas will be discharging below the high water mark of the Reservoir, those areas of the Project discharging above the high water mark will be directed into vegetated roadside swales to prevent hydromodification/erosion downstream, and the Project's drainage system and storm water capture and treatment BMPs are designed to comply with all applicable regulations, including the standards in the County's Drainage Design Manual and SSM, to prevent onsite erosion. As set forth in the SWMP, Treatment Control BMPs (bioretention basins, vegetated roadside swales, and storm drain inlet treatment devices such as Filterra Units) which have a high to medium removal efficiency for sediment, as well as source control BMPs would be incorporated into the proposed Project design (described further below) to capture sediment and other pollutants prior to runoff being discharged from the Project site. Finally, the 14 new culverts would be sized to safely convey 100-year peak flows and rip rap would be required at the outlet of all culverts to prevent downstream erosion. Therefore, the alterations in the drainage pattern as a result of the proposed Project are not likely to result in substantial erosion or siltation on-site or off-site, and impacts related to this issue are considered ***less than significant***.

Guideline for the Determination of Significance

A significant impact to hydrology would occur if the project would do the following:

2. The project will increase water surface elevation in a watercourse within a watershed equal to or greater than 1 square mile by 1 foot or more in height, and, in the case of the San Luis Rey River, San Dieguito River, San Diego River, Sweetwater River, and Otay River, 2/10ths of a foot (0.2 foot) or more in height.

Analysis

As discussed above, development of the Project site would internally alter certain drainage areas discharging into the culverts located under Otay Lakes Road. After flowing under Otay Lakes

Road, runoff would discharge to Lower Otay Lake, which is a man-made drinking water reservoir managed by the City of San Diego Public Utilities Department. The reservoir collects and stores water from upstream areas totaling 98 square miles, including the Project site (approximately 2.95 square miles) and operates under conditions of fluctuating water levels. However, as shown in **Table 3.2-1**, and as discussed above and further below, the proposed Project would not substantially alter the drainage pattern or substantially increase the overall amount of runoff draining into Lower Otay Lake. Moreover, the capacity of Lower Otay Lake is sufficient to convey any potential peak flow increases, due to the ability of the reservoir operators to fluctuate water levels through the use of the spillways as well as outletting water to the City's water treatment plant. Thus, the proposed Project would not have an adverse effect on the water surface elevation in Lower Otay Lake and impacts related to this issue are considered ***less than significant***.

Guideline for the Determination of Significance

A significant impact to hydrology would occur if the project would do the following:

3. The project will result in increased velocities and peak flow rates exiting the project site that would cause flooding downstream or exceed the stormwater drainage system capacity serving the site.

Analysis

As discussed above and as shown in **Figure 3.2-6**, the proposed Project would implement a storm drain system and treatment control BMPs to capture and treat runoff from the developed areas of the Project site. Much of the runoff from those areas of the Project site to remain undeveloped/natural would be conveyed directly to Lower Otay Lake. A portion of runoff from natural areas would be captured by the Project's storm drain system and detained and treated in conjunction with runoff from developed areas by the Project's bioretention basins. As discussed above, the proposed Project would replace the existing 23 culverts with 14 new upgraded culverts and extend a set of existing twin box culverts (Crossing #3). The new and upgraded culverts would be sized to accommodate 100-year peak flows so that overtopping of the roadway is eliminated.

**Table 3.2-2,** shows that 10 of 23 discharge locations affected by development of the Project would have increased peak flows that would require upgrading of the existing culverts, with only four of those having significantly increased peak flow rates. However, under existing conditions, as stated above, peak flow rates at some existing culverts exceed the capacity of these culverts to accommodate these peak flows, which causes the elevation of the water at the inlet to the culvert to eventually exceed that of Otay Lakes Road, resulting in runoff either overtopping the road or sheet flowing on top of the road to the next low point, where it eventually flows into Lower Otay Lake. The upgraded culverts would eliminate the overtopping and the excessive erosion associated with overtopping by being sized and designed to safely discharge all 100-year peak flows.

In addition, as detailed in **Table 3.2-1**, the proposed Project would result in an approximately 21 percent increase (617 cfs net increase in peak flows) in the combined 100-year event peak flows

into Lower Otay Lake in comparison to the pre-development condition. The existing 100-year peak flow from the total contributing watershed to Lower Otay Lake is approximately 20,000 cfs. The Project's overall increase in flow rates would not impact the capacity of Lower Otay Lake as it has sufficient volume to accept the peak flow increases. Lower Otay Lake has a capacity of 49,850 acre-feet when full and the City of San Diego Long-Range Planning and Water Resources Division has provided data that the average volume of water storage in Lower Otay Lake between 1980 and 2010 was 40,300 acre-feet (City of San Diego 2012). In addition, the maximum water surface elevation is 490.7 feet in a high rainfall year. To accommodate increased winter and spring storm runoff, by October 1 of each year the reservoir's water surface elevation is lowered to at least 484.2 feet through the use of the spillways, which have a capacity of 49,400 cfs. Therefore, due to the large storage volume provided by Lower Otay Lake and the ability of the City of San Diego to control the volume of the reservoir through the use of its spillways, the potential for flooding downstream of the Project site is considered to be minimal, eliminating the need for flood control detention facilities for this Project.

In summary, while development of the Project site would increase design flow rates as compared to pre-development conditions, the increases would not cause downstream flooding or exceed the stormwater drainage system capacity serving the site. The increased flow rates would be accommodated by the substantial runoff capacity and built-in flood control of the Lower Otay Reservoir eliminating a need for flood control for the Project. Furthermore, the increased flow rates would be further accommodated by implementing the Project's BMPs, by increasing the capacity of the culverts under Otay Lakes Road to accommodate the 100-year storm event and eliminate overtopping of the roadway during major storm events, and by installing erosion control in the form of rip-rap at all culvert discharges. Therefore, implementation of the proposed Project would not result in increased velocities or peak flow rates that would cause flooding downstream or exceed the stormwater drainage system capacity serving the Project site. The proposed Project would also eliminate the localized roadway flooding along Otay Lakes Road caused by the existing, undersized culverts under Otay Lakes Road. Therefore, impacts related to increased velocities and flow rates are considered ***less than significant***.

Guidelines for the Determination of Significance

A significant impact to hydrology would occur if the project would do the following:

4. Result in placing housing, habitable structures, or unanchored impediments to flow in a 100-year floodplain area or other special flood hazard area, as shown on a FIRM, a County Flood Plain Map, or County Alluvial Fan Map, which would subsequently endanger health, safety, and property due to flooding.

5. Place structures within a 100-year flood hazard or alter the floodway in a manner that would redirect or impede flow resulting in any of the following:

    - Alter the Lines of Inundation resulting in the placement of other housing in a 100-year flood hazard; or

    - Increase water surface elevation in a watercourse with a watershed equal to or greater than 1 square mile by 1 foot or more in height and, in the case of the

San Luis Rey River, San Dieguito River, San Diego River, Sweetwater River, and Otay River, 2/10 of a foot or more in height.

Analysis

The Project site is located outside any FEMA floodplain boundaries, as depicted in **Figure 3.2-7**, and would not place housing within a 100-year flood hazard area. In addition, prior to recordation of final maps, 100-year flood lines would be established for any lot encumbered by a drainage channel conveying a watershed area in excess of 25 acres. Any such drainage channel floodplain boundary would be clearly delineated on the non-title information sheet of the final maps. Therefore, the impacts related to these issues are considered ***less than significant***.

### 3.2.2.2 *Water Quality*

Guideline for the Determination of Significance

A significant impact to water quality would occur if the project would do the following:

- The project is a development project, as defined in the WPO, County of San Diego Code of Regulatory Ordinances (Regulatory Ordinances) Section 67.803, and does not comply with the standards set forth in the County SSM or the Additional Requirements for Land Disturbance Activities set forth in the WPO, Regulatory Ordinances Section 67.811.

Analysis

Compliance with the SSM and Additional Requirements for Land Disturbance Activities set forth in the WPO ensures that the proposed Project complies with all applicable state and federal laws that protect surface water quality. The SSM sets out, in detail by project category, the requirements for a discharger to comply with the WPO so as to minimize impacts to surface water quality to a less-than-significant level. The SSM addresses the use of pollution prevention practices and BMPs for specific activities or facilities, and connections for, and disposal of, stormwater. The proposed Project design is consistent with the applicable standards presented in the SSM and the Additional Requirements for Land Disturbance Activities set forth in the WPO.

A SWMP has been prepared for the proposed Project that describes the implementation of the BMPs required by the WPO. Specifically, as required by the SSM and WPO, and as detailed in the SWMP, the proposed Project would implement the following BMPs.

Construction-Phase BMPs

These BMPs would include silt fence, fiber rolls, street sweeping and vacuuming, protection of open graded slopes, storm drain inlet protection, stockpile management, solid waste management, stabilized gravel construction entrance/exit with steel shaker plates, vehicle and equipment maintenance areas, gravel bag berms, material delivery and storage areas, and best practices for spill prevention and control, concrete waste management, water conservation, and paving and grinding operations. These BMPs are proposed to prevent sediment and non-

stormwater pollutants through the use of erosion control, sediment control, waste management, and good housekeeping measures.

*Site Design Measures and LID BMPs*

The proposed Project is a Priority Project and must be designed to minimize, to the maximum extent practicable, the introduction of pollutants generated from site runoff to the stormwater conveyance system. Site design components can significantly reduce such impacts. In addition, LID components may also be incorporated into a project to significantly reduce the impact of the project on the environment. LID is an innovative stormwater management approach that focuses on infiltrating a portion of the stormwater runoff into the Project site to reduce off-site stormwater runoff, recharge groundwater, and clean runoff naturally through infiltration into landscape areas or other pervious surfaces. The principle behind LID is to manage rainfall runoff at the source using uniformly distributed decentralized micro-scale controls. The goal of LID is to mimic a site's pre-development hydrology by using design practices and techniques that effectively capture, filter, store, evaporate, detain, and infiltrate runoff close to its source. Following is a list of the LID principles from the County's LID Handbook and a description of how the Project would comply with the design principle:

- ***Conserve natural resources that provide valuable natural functions associated with controlling and filtering stormwater.***

  The Project includes the on-site preservation of 1,089 acres (approximately 60 percent of the Project site) of undisturbed natural open space, including the preservation of natural drainages, wetland habitat, and upland habitat.

- ***Minimize and disconnect impervious surfaces.***

  The Project includes 795 acres of disturbed/developed areas, approximately 321 acres (40%) of which are considered impervious surfaces (e.g., rooftops and pavement). This equates to an overall impervious area of approximately 16.75 percent of the 1,917-acre Project area. Where it is safe and appropriate and would not damage or cause adverse impacts to any existing or proposed structures, slopes, pavements, or other Project features, prior to discharging to the storm drain system, the Project would minimize directly connected impervious areas where landscaping is proposed and direct runoff from rooftops, impervious parking lots, sidewalks, walkways, and patios into adjacent landscaping or pervious/natural drainage swales.

- ***Direct runoff to natural and landscaped areas conducive to infiltration.***

  The Project uses distributed small-scale controls or Integrated Management Practices (IMPs) to mimic the site's pre-project hydrology. These IMPs include vegetated roadside swales, bioretention basins, and, where appropriate, directing runoff from impervious areas into adjacent vegetation or pervious/natural drainage swales.

- ***Stormwater education leads to pollution prevention.***

  Stormwater capture and treatment BMP's would be located throughout the Project site and would be an integral and visible part of the Project's infrastructure. Clean water ("No Dumping") notices would be stenciled on storm drain entrances as a reminder to residents that dumping pollutants, trash, waste water, etc., into storm drains is strictly prohibited. New homebuyers would be provided with educational material on the stormwater treatment, control, and infiltration infrastructure both on their lot and throughout the Project. This educational material would also include information on the clean water regulations that apply to all owners, residents, and visitors. The HOA and Covenants, Conditions, and Restrictions (CC&R's) for the Project would further restrict owners, residents, and visitors from removing or modifying stormwater treatment, control and infiltration infrastructure, including on their own property; and the CC&R's would include strict prohibitions on releasing pollutants, trash, and wastewater into the stormwater conveyance system. The CC&R's would also incorporate by reference the clean water regulations that all owners, residents, and visitors must follow.

In addition to the measures above, the Project would include the following design features and grading and construction techniques that advance the design principles of LID:

- The proposed Project would minimize soil compaction in landscaped areas by scarifying the topsoil layer at least 6 inches in areas disturbed by construction prior to installation of the final landscape palette. If upper layers of topsoil exist or are imported, these topsoil materials would be incorporated to avoid stratified layers.

- The Project site has been designed to protect slopes and channels for purposes of energy dissipation and erosion control. Methods of accomplishing this goal include the use of natural drainage systems to the maximum extent practicable, stabilizing permanent channel crossings, planting native or drought-tolerant vegetation on slopes, and using energy dissipaters, such as rip-rap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels. All Project site slopes would be stabilized by erosion-control measures. All outfalls would be equipped with an energy dissipation device and/or rip-rap pad to prevent high-velocity erosion.

- The proposed Project would incorporate a rural swale system, urban curb swale system, or a dual drainage system for private roads. Residential driveways and guest parking on residential lots would be designed so that runoff would drain to landscaping or pervious/natural drainage swales prior to being discharged to the Project's drainage system. Steep hillsides that are disturbed by Project development would be landscaped with deep-rooted, drought-tolerant, and/or native vegetation selected for erosion control. These design features would be installed/implemented and maintained by the contractor until the homeowner's association is established.

*Source Control BMPs*

Source control BMPs would be incorporated into the proposed Project, including storm drain inlet stenciling and signage, use of alternative methods other than use of pesticides for proposed

landscaping, drought-tolerant landscaping and weather-based irrigation controls to minimize irrigation runoff, and providing regular street sweeping.

The proposed Project would incorporate storm drain inlet stenciling and signage, such as concrete stamping or the equivalent, for all storm drain inlets within the Project site using prohibitive language. In compliance with the County Model Landscape Ordinance, the Project would include drought-tolerant low water use landscaping in all common areas, parkways, and, where feasible, in public and community spaces. All common area landscaping will be controlled by weather-based irrigation controllers to minimize overwatering and water waste. Compliance with the County's Model Landscape Ordinance will ensure that irrigation runoff onto impervious surfaces, which contains pollutants, is minimized.

Integrated Pest Management (IPM) is an ecosystem-based pollution-prevention strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitation manipulation, modification of cultural practices, and/or the use of resistant plant varieties. Pesticides are used only after monitoring indicates that they are needed to be applied according to established guidelines. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment. IPM includes planting pest-resistant or well-adapted plant varieties such as native plants, discouraging pests by modifying site and landscape design, and distributing educational materials to future residents.

Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris, debris from pressure washing shall be collected to prevent entry into the storm drain system, and any washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not to the Project's storm drain system.

All proposed source control BMPs would be installed and maintained by the developer/builder and a homeowner's association would be established and responsible for ongoing maintenance of the Project's private improvements for the life of the Project.

*Storm Water Capture and Treatment Control BMP Design*

The proposed Project's BMP design would include both flow-based and volume-based BMPs and certain landscaped areas/pervious surfaces that are either self-treating or provide treatment for impervious surfaces such as parking lots and roofs. Flow-based BMPs are designed to decrease the maximum flow rate of runoff produced from a storm event having rainfall intensity of 0.2 inch per hour. Flow-based BMPs are designed to treat up to the peak flow rate, while volume-based BMPs treat up to the peak volume of the storm. As discussed above under Source Control BMPs, landscape areas will be subject to the County's Model Landscape Ordinance to minimize runoff as well as IMP practices to minimize the application of pesticides and ensure the long-term survival of landscape areas.

As described in Section 3.2.2.1 and in greater detail in the Project's Major SWMP, the proposed Project would implement a system of treatment control BMPs that would consist of bioretention basins, vegetated roadside swales for hydromofication attenuation and water quality purposes,

and hi-rate biofilters (e.g., Filterra Units or equivalent storm drain inlet treatment control devices). The Project's proposed basins and storm drain inlet treatment control devices are depicted in **Figures 3.2-6**. Design details and the maintenance and operational protocols for the basins and inlet devices are provided in the Major SWMP in this EIR, **Appendix C-14**.

The proposed Project would include fifteen (15) water quality BMPs comprising seven (7) volume-based bioretention basins and eight (8) vegetated roadside bioretention swales that treat 671.4 acres (84.5%) of the Project's 795 acres of developed/disturbed area. Volume-based BMPs are designed to settle the runoff volume produced from the 85th percentile storm event, between 24 and 96 hours. The 85th percentile rainfall has been calculated for the Project site to be 0.65 inch of rain in a 24-hour period. This volume would be stored below the basin spillway elevation (riser, weir, etc.). The runoff volumes contained below the overflow elevation of the basin riser would be slowly discharged from the treatment control basin via low-flow orifice(s) in the basin riser. After passing through the riser, an outlet pipe would discharge runoff to the receiving storm drain.

Runoff would be detained in the water quality basins and treated during the time it takes to drain completely. Treatment would include the settling of pollutants within the basins and filtering through the heavy vegetation at the bottom of each basin. A trash and debris rack would be fitted to the base of each structure to prevent clogging of the low-flow orifices. In this way, stormwater pollutant, trash and debris removal would occur prior to discharge into Lower Otay Lake. Outlet structures at each basin would be sized and designed to convey runoff from the 100-year storm event.

Due to topographic constraints that make water quality basins infeasible, runoff from the remainder of the Project's developed/disturbed area (63.8 acres or 15.5% of the total 795 acres) including runoff from certain portions of Otay Lakes Road and Strada Piazza would be treated via Filterra Units or equivalent storm drain inlet treatment control devices and then discharged into natural drainages conveying flows into Lower Otay Lake. A Filterra Unit is flow-based storm drain inlet treatment control device that is a stand-alone system that accepts surface sheet flow from both streets and parking lots. A standard Filterra Unit treats the 85$^{th}$ percentile rainfall event and includes a bypass structure for higher flows.

The Project's water quality basins (bioretention basins and vegetated roadside swales), treating 84.5% of the Project's developed/disturbed area, provide a high removal efficiency for course sediment, trash and debris, a high removal efficiency for pollutants that tend to associate with fine particles during treatment including fine sediment, undissolved nutrients, heavy metals, organic compounds, oxygen demanding substances, bacteria, oil and grease, and pesticides, while providing medium pollutant removal efficiency for dissolved nutrients. The Project's high-rate biofilters, treating another 8.0% of the Project's developed/disturbed area, provide a high removal efficiency for course sediment, trash and debris, a medium pollutant removal efficiency for pollutants that tend to associate with fine particles during treatment including fine sediment, undissolved nutrients, heavy metals, organic compounds, oxygen demanding substances, bacteria, oil and grease, and pesticides, and low pollutant removal efficiency for dissolved nutrients. Finally, the remaining 7.5% of the Project's developed/disturbed areas consisting of vegetated and irrigated slopes within the Project's development footprint that will

not receive runoff from the project's streets and roads and will be self-treating and natural landscaped slopes.

In summary, as a result of implementation of the proposed BMPs discussed above, the proposed Project would comply with the standards set forth in the County SSM or the Additional Requirements for Land Disturbance Activities set forth in the WPO. Therefore, impacts related to this issue are considered ***less than significant***.

Guideline for the Determination of Significance

A significant impact to water quality would occur if the project would do the following:

- Drain to a tributary of an impaired water body listed on the Clean Water Act Section 303(d) List, and will contribute substantial additional pollutant(s) for which the receiving water body is already impaired.

Analysis

As discussed above, runoff from the proposed Project would drain to Lower Otay Lake, which is identified on California's 2010 List of Water Quality Limited Segments as impaired for color, iron, manganese, nitrogen, ammonia, and high pH.

Additionally, under the City of San Diego SWPG, the highest priority pollutants of concern for the City's drinking water reservoirs include nutrients (nitrogen and phosphorus), Total Organic Compounds (TOCs), and Total Dissolved Solids (TDS). Accordingly, the following pollutants are considered primary pollutants of concern under the CWA Section 303(d) List and the SWPG: nutrients, TDS, Total Organic Compounds (TOCs), and heavy metals. Secondary pollutants of concern include sediments, trash and debris (except leaves and decaying vegetation), oxygen-demanding substances, bacteria, oil and grease, and pesticides.

The Project area, including those portions of Otay Lakes Road to widened and realigned, is a 1917-acre area that contributes runoff into Lower Otay Lake from the 2,491-acre watershed shown in **Figure 3.2-2**. An analysis of urban runoff, including TDS, into Lower Otay Lake was conducted for the proposed Project (Dexter Wilson Engineering, Inc. 2012). Approximately 1,009.5 acres of the proposed Project site would be tributary to the Project's proposed water quality basins, of which approximately 671.4 acres are proposed for development and 338.1 acres would be natural open space (see **Table 3.2-3**). The Project's stormwater BMPs (bioretention/water quality basins, Filterra units, source control BMPs, Site Design & LID BMPs, etc.) have been selected and designed in accordance with the City's SWPG.

As discussed in more detail above, runoff from the majority of the developed portions of the site (84.5%) would receive treatment in water quality basins (bioretention basins and vegetated roadside swales). Runoff from certain portion of Stradda Piazza and Otay Lakes Road would be treated by storm drain inlet inserts such as Filterra Units or an equivalent flow-based treatment device. Finally, four outfalls of the project area were determined to be subject to hydromodification attenuation. Vegetated roadside swales that provide water quality treatment

and hydromodification attenuation are proposed for these four areas. The locations of the proposed bioretention basins, storm drain inlet inserts, and vegetated roadside swales are shown in **Figure 3.2-6**.

The bioretention basins are volume-based treatment facilities that would detain and treat the 85$^{th}$ percentile storm flow rate to ensure that solids have adequate time to settle out within the basins before being discharged into Lower Otay Lake. The bioretention basins have a high pollutant removal efficiency for heavy metals and TOCs (two of the four primary pollutants of concern), a high removal efficiency for all of the secondary pollutants of concern identified above, and a medium pollutant removal efficiency for dissolved nutrients and TDS (the remaining two primary pollutants of concern). The vegetated swales are also volume-based water quality basins sized to detain and treat the 85$^{th}$ percentile storm flow rate as well as perform hydromodification attenuation. The vegetated swales have a high pollutant removal efficiency for heavy metals and TOCs (two of the four primary pollutants of concern), a high removal efficiency for all of the secondary pollutants of concern identified above, and a medium pollutant removal efficiency for dissolved nutrients and TDS (the remaining two primary pollutants of concern).Finally, the Filterra Units are flow-based treatment devices and do not perform any detention, however the Filterra Units have a medium pollutant removal efficiency for heavy metals and TOCs (two of the four primary pollutants of concern), a high removal efficiency for sediments and trash and debris (two of the six secondary pollutants of concern), a medium removal efficiency for oxygen demanding substances, bacteria, oil and grease, and pesticides (the remaining four secondary pollutants of concern), and a low pollutant removal efficiency for dissolved nutrients and TDS (the remaining two primary pollutants of concern).

Finally, implementation of the proposed Project would reduce certain impacts occurring without the Project. Runoff from Otay Lakes Road in its current condition receives no pollutant removal treatment prior to it entering Lower Otay Lake. The proposed widening and realignment of Otay Lakes Road with implementation of the Project would result in Treatment Control BMPs (vegetated roadside swales and Filterra Units) being implemented for roadway runoff, resulting in a substantial reduction in pollutants entering the Lake from Otay Lakes Road with the proposed Project. Additionally, the proposed Project would capture and treat runoff from approximately 338 acres of land to remain undeveloped in its bioretention basins. While these lands are not a significant source of pollutants, the bioretention basins have a high removal efficiency for course sediment and will, therefore, reduce sediment impacts to the Lake from these lands when compared to the sediment contribution these lands have on the Lake today.

In conjunction with the Project's *Treatment Control BMPs* (water quality basins and Filterra Units) discussed above, the Project would also implement the BMPs described above under Construction-Phase BMPs, *Site Design Measures and LID BMP*s, and *Source Control BMPs* to reduce the amount of primary and secondary pollutants of concern entering the storm drain system and thereby requiring treatment by the Project's *Treatment Control BMPs*. As discussed above, the Project's water quality basins (bioretention basins and vegetated roadside swales) and Filterra Units have a high to medium pollutant removal efficiency for the primary and secondary pollutants of concern with exception of TDS and dissolved nutrients. The Project's BMPs have a medium to low pollutant removal efficiency for TDS and dissolved nutrients. Accordingly, a separate analysis of urban runoff into Lower Otay Lake was performed for these types of

pollutants to determine whether the Project would have a significant effect on the Lake as a drinking water reservoir.

The analysis of urban runoff into Lower Otay Lake, included as Appendix 3 to the Major SWMP (**Appendix C-14**) conducted for the Project utilized the City's SWPG as the guidance document to evaluate what effects the Project might have on TDS, nitrogen, and phosphate levels in the Lake as a drinking water reservoir. The analysis evaluated the potential impacts of the Project under three scenarios: when the reservoir is full, when the reservoir is at an average storage elevation, and when the reservoir is at its 30$^{th}$ percentile storage volume (low). The analysis indicates that the full development of the Project would increase the average yearly runoff into Lower Otay Lake by 251.1 acre-feet and would constitute less than 1% of the total volume of water entering the reservoir. In an average year, the increased level of salt in this runoff would be approximately 594,750 pounds per year (lb/yr). Although the increased runoff from the Project would reduce the amount of water that needs to be imported into the reservoir, thereby resulting in a reduction in the salt loading from the imported water, an overall increase in salt loading would still occur. The net increase in salt loading as a result of the Project would be approximately 253,787 lb/yr. This amount of salt represents an approximately 0.4 percent increase in the amount of salt in Lower Otay Lake when the reservoir is full, a 0.5 percent increase when the reservoir is at its average storage level, and a 0.6 percent increase when the reservoir is at its 30$^{th}$ percentile storage level (Dexter Wilson Engineering, Inc. 2012).

The urban runoff analysis also evaluated the potential impacts to Lower Otay Lake from the presence of nitrogen and phosphate in stormwater runoff from the Project. The results of the analysis indicate that the increased nitrogen loading from Project runoff would be 1,608 lb/yr. As with salt loading, offsetting the imported water with Project runoff would result in a net increase in nitrogen loading as a result of the Project of approximately 1,403 lb/yr or an approximately 2.3 percent increase in the amount of nitrogen in Lower Otay Lake when the reservoir is full, a 2.8 percent increase when the reservoir is at its average storage level, and a 3.1 percent increase when the reservoir is at its 30$^{th}$ percentile storage level. For phosphate, imported water contains a negligible amount of this inorganic chemical and no data were available on the existing phosphate levels in the reservoir. The increased phosphate loading from Project runoff would be 58 lb/yr (Dexter Wilson Engineering, Inc. 2012) and the effect of this additional phosphate in the Project runoff is anticipated to have a negligible impact on the reservoir's phosphate concentration.

The results of the Project's salt and nutrient loading analysis have been reviewed by the City of San Diego Long-Range Planning and Water Resources Division. Their analysis evaluated the volume of salt and nitrogen loading based on the average volume of water storage in Lower Otay Lake from 1980 through 2010 of 40,300 acre-feet and the 30$^{th}$ percentile storage volume during this same period of 37,200 acre-feet. The results of the City's analysis, which is included as Appendix 3 to the Storm Water Management Plan (**Appendix C-14**) showed that the percentage increase in salt and nitrogen loading from Project runoff would be 0.5 percent and 2.8 percent, respectively, at average storage volume in Lower Otay Lake, and 0.6 percent and 3.1 percent at the 30th percentile of storage volume (City of San Diego 2012). A comparison of these findings is shown in **Table 3.2-4**.

The proposed Project site drains to Lower Otay Lake, which is an impaired water body listed on the CWA Section 303(d) List as well as a drinking water reservoir subject to the City of San Diego's SWPGs. As described above and in compliance with the County's SSM, the Project would implement *Site Design Measures and LID BMPs*, *Source Control BMPs*, and *Treatment Control BMPs*, the latter of which have a high to medium pollutant removal efficiency for both primary and secondary pollutants of concern with the exception of dissolved nutrients and TDS. Implementation of the Project's *Treatment Control BMPs* would also substantially reduce certain water quality impacts occurring today as a result of untreated runoff from Otay Lakes Road entering Lower Otay Lake and from undeveloped land on the Project site contributing sediment to the Lake. In the case of dissolved nutrients and TDS, the analysis above and included as Appendix 3 to the Project's Major SWMP demonstrates that, despite the low pollutant removal efficiency of the Project's *Treatment Control BMPs* for dissolved nutrients and TDS, the Project would not result in a significant increase in salt or nutrient levels within the Reservoir. Therefore, with implementation of the Project's BMPs, the Project would not contribute substantial additional pollutant(s) for which the receiving water body is already impaired and impacts related to this issue are considered ***less than significant***.

Guideline for the Determination of Significance

A significant impact to water quality would occur if the project would do the following:

- Drain to a tributary of a drinking water reservoir and will contribute substantially more pollutant(s) than would normally run off from the project site under natural conditions.

Analysis

Runoff from the Project site drains into Lower Otay Lake, a drinking water reservoir. However, as discussed above, runoff from the proposed Project would be subject to a comprehensive set of BMPs, including *Construction-Phase BMPs*, *Site Design Measures and LID BMPs*, *Source Control BMPs*, and *Treatment Control BMPs* to remove potential pollutants from the Project's storm water runoff prior to the runoff entering the Reservoir. Furthermore, as discussed in the previous section addressing the Project's runoff to a CWA Section 303(d)-listed impaired water body, the proposed Project would not contribute substantially more pollutant(s) than would normally run off from the Project site to Lower Otay Lake under natural conditions and, therefore, impacts related to this issue are considered ***less than significant***.

Guideline for the Determination of Significance

A significant impact to water quality would occur if the project would do the following:

- Contribute pollution in excess of that allowed by applicable state or local water quality objectives or will cause or contribute to the degradation of beneficial uses.

Analysis

As stated above, the beneficial uses identified in the RWQCB San Diego Basin Plan for Lower Otay Lake and upstream unnamed tributaries (Basin No. 910.31) include municipal and domestic supply, agricultural supply, industrial process supply, industrial service supply, recreational uses, cold and warm freshwater habitat, wildlife habitat, biological habitats of special significance (unnamed tributaries only), and rare species habitats (unnamed tributaries only). The Basin Plan also sets forth water quality objectives for the Otay Hydrologic Unit.

The proposed Project is expected to add pollutants to runoff from urban development. The addition of these pollutants to Lower Otay Lake could violate water quality objectives required to sustain the beneficial uses without a properly designed water quality treatment system. Runoff from the developed portion of the Project site would be subject to a comprehensive set of BMPs including *Construction-Phase BMPs*, *Site Design Measures and LID BMPs*, *Source Control BMPs*, and *Treatment Control BMPs* as discussed in detail above to reduce and remove potential pollutants from the Project's runoff. As described above, with incorporation of these BMPs, the proposed Project would not contribute substantially more pollutants than would normally run off from the Project site to Lower Otay Lake under natural conditions. Thus, development of the Project site would not degrade potential beneficial uses of downstream water bodies as designated by RWQCB and impacts related to this issue are considered ***less than significant***.

Guideline for the Determination of Significance

A significant impact to water quality would occur if the project would do the following:

- Not conform to applicable federal, state, or local "clean water" statutes or regulations including, but not limited to, the federal Water Pollution Control Act, California Porter-Cologne Water Quality Control Act, and the County WPO.

Analysis

According to the City of San Diego Source Water Protection Guidelines (SWPG), the Project is considered a Tier 3 project, which requires the highest level of pre-treatment and post-treatment BMPs to enhance the effectiveness of the Project's pollutant treatment controls. All proposed BMPs for this Project were designed according to the Tier 3 BMP recommendations, as is shown within the SWPG worksheet in Attachment I of the Major SWMP for Otay Ranch Resort Village (**Appendix C-14** of this EIR).

Implementation of the proposed Project would include construction-related activities such as grading and other earth-moving activities. These activities would generate sediment and dust that could affect water quality. In addition, the proposed Project would result in an increase in post-construction pollutants related to development of the property and the effects of automobile use. Runoff from paved surfaces may contain both sediment in the form of silt and sand, and a variety of pollutants transported by the sediment. Landscape activities by homeowners would be an additional source of sediment and pollutants. To reduce the potential impacts to water quality,

the proposed Project would be required to comply with the SWRCB Construction General Permit and the NPDES Municipal Permit, as described above.

To be covered under the Construction General Permit, a Notice of Intent must be filed with the SWRCB. Compliance with the permit requires that a SWPPP be prepared and implemented for the proposed Project, and that construction BMPs, post-construction BMPs, inspections, sampling, and monitoring for water quality be addressed. A SWPPP must be prepared and submitted to the SWRCB and a Waste Discharge Identification Number (WDID) must be received prior to construction.

To address post-construction water quality impacts during operation of the Project from pollutants related to urban development, automobile use, and landscaping activities, the proposed Project would be required to comply with the requirements of the Municipal Permit, and the County's WPO and SUSMP requirements pursuant to the Municipal Permit.

The RWQCB, County of San Diego, and City of San Diego require treatment of the 85th percentile runoff at the Project site prior to discharge into Lower Otay Lake. To address this requirement, as discussed above, the proposed Project would divert runoff from the developed portions of the Project site for treatment via bioretention basins, vegetated roadside swales, and storm drain inlet water quality treatment devices (e.g., Filterra Units or equivalent treatment control devices). Runoff in excess of the 85th percentile, which is considered to be clean water, would overtop the basin risers within the water quality basins, and drain to Lower Otay Lake through the proposed storm drain system. The Project's vegetated swales are designed to attenuate flows for up to a 10-year rainfall event to prevent downstream erosion and scouring (hydromofication).

In summary, the proposed Project has been designed to comply with all applicable water quality standards and guidelines for storm water runoff. As discussed above, the Project includes a comprehensive set of *Construction-Phase BMPs*, *Site Design and LID BMPs*, *Treatment Control BMPs*, and *Source Control BMPs*. These applicable BMPs are in compliance with the standards set forth in the NPDES permit requirements, the County SUSMP requirements, and the City of San Diego Source Water Protection Guidelines (SWPG). Thus, implementation of the Project's BMPs conforms to applicable federal, state, and local water quality statutes and regulations and, therefore, impacts related to this issue are considered ***less than significant***.

### 3.2.3 Cumulative Impact Analysis

The proposed Project is located within the Otay Hydrologic Unit (Basin No. 910.31), and runoff from this unit, including the proposed Project site, drains to Lower Otay Lake. Therefore, the scope of the cumulative impacts analysis area includes all development within the Otay Hydrologic Unit that drains into Lower Otay Lake.

Implementation of the proposed Project would increase the amount of soil disturbance and the impervious surfaces within the Project area, thereby increasing the amount of runoff from the Project area. Without BMPs and compliance with County, state and federal regulations, these effects could potentially cause a substantial increase erosion, runoff, flooding hazards, and

pollutant concentrations within the Otay Hydrologic Unit. However, as discussed above, the Project's drainage system and storm water capture and treatment system would be designed to meet the County's Drainage Design Manual and Stormwater Standards Manual design requirements as well as applicable state and federal water quality and flood control regulations. Furthermore, 97% of the Project area would discharge runoff below the high water mark of Lower Otay Lake and the remaining 3% of the Project area would be subject to hydromodification attenuation to prevent downstream erosion. The Project's BMPs are designed to trap sediment and minimize downstream sedimentation. The capacity of Lower Otay Lake in conjunction with its spillways is sufficient to accommodate any peak flow increases as a result of the Project and prevent any downstream flooding, and the Project site is outside any FEMA floodplain boundaries and would not place housing within a 100-year flood hazard area. Thus, it was determined that the Project's direct hydrology impacts would be less than significant.

The Project impact as a contributor to Lower Otay Lake is addressed under the second water quality guideline in Section 3.2.2.2 of this EIR. Under the City of San Diego SWPG, the highest priority pollutants of concern in runoff to Lower Otay Lake are nutrients, TOC, and TDS. The Lake is also listed on the CWA Section 303(d) List as being impaired for heavy metals and nutrients. In the case of nutrients and TDS, an analysis of urban runoff was conducted for the Project by Dexter Wilson Engineering and the results of the Project's salt and nutrient loading analysis have been reviewed by the City of San Diego Long-Range Planning and Water Resources Division. Their analysis showed that the percentage increase in salt and nitrogen loading from Project runoff would be 0.5 percent and 2.8 percent, respectively, at the average storage volume in Lower Otay Lake (City of San Diego 2012). In the case of heavy metals and other pollutants of concern, the Project's *Treatment Control BMP*s have a high to medium removal efficiency these pollutants. Furthermore, as discussed above, as part of the proposed Project, the widening and realignment of Otay Lakes Road would result in *Treatment Control BMPs* being installed to treat the runoff from the road that is not currently receiving any treatment, resulting in a substantial reduction of pollutants entering the Reservoir from those improved portions of Otay Lakes Road. Thus, with implementation of the Project's BMPs and in light of the analysis demonstrating that the Project's TDS and nutrient contributions to the Reservoir would have a less than significant impact on the levels of these pollutants in the Reservoir, it was determined that the Project's direct water quality impacts to Lower Otay Lake would be ***less than significant***.

As shown in **Figure 3.3-2** in the Land Use and Planning section of this EIR, the majority of the adjacent properties that drain to the Otay Lakes are designated by the Otay Community Plan as either Open Space (Conservation) or Public Agency Lands; and the nearest adjacent private lands within the Project boundary and lands adjacent to the east are designated Rural Lands (RL-80), which permits 1 dwelling unit per 80 acres. As with the proposed Project, all related cumulative projects in the unincorporated County area would also be required to implement the federal, state, and local regulatory requirements, including the Construction General Permit, the Municipal Permit, and the related County ordinances and standards outlined above. Specific requirements include BMPs to treat and detain runoff from the 85$^{th}$ percentile design storm event, to, where applicable, design detention facilities or basins to attenuate flows to prevent hydromodification, to prevent downstream flooding, erosion, and siltation, and to reduce the volume of post-development runoff containing pollutant loads that cause or contribute to an

exceedance of water quality objectives in the receiving waters to the maximum extent practicable. In addition, urban runoff management plans to reduce runoff and contaminant discharges to the maximum extent practicable would also be required and implemented as watershed-based strategies for other land development projects within the local Project area and the region. BMPs for the cumulative projects would be consistent with regional surface water, stormwater, and groundwater planning and permitting processes that have been established to improve the overall water quality in County watersheds.

Therefore, adherence to all applicable flood-control and storm water regulatory requirements by all development Projects within the Otay Hydrologic Unit that drains into Lower Otay Lake minimizes the cumulative impacts to hydrology and water quality resulting from multiple projects. As a result, no cumulatively considerable hydrology or water quality impacts have been identified. Thus, the proposed Project, in conjunction with other related cumulative projects, would not cause cumulatively considerable runoff or degradation of water quality in the Otay Hydrologic Unit subarea and ***the cumulative Project impact would be less than significant***.

### 3.2.4 Significance of Impacts Prior to Mitigation

With implementation of the BMPs discussed above, as required by federal, state, and local regulations, the proposed Project is not expected to result in significant Project-related or cumulative impacts.

### 3.2.5 Mitigation

No mitigation measures are proposed because the proposed Project design (i.e., *Construction-Phase BMPs*, *Site Design and LID BMPs*, *Treatment Control BMPs*, and *Source Control BMPs*) avoids all potentially significant Project-related impacts associated with hydrology and water quality. BMPs would be implemented by the proposed Project and other related cumulative projects in accordance with applicable laws and regulations to avoid significant hydrology and water quality impacts during construction and operation.

### 3.2.6 Conclusion

The proposed Project would implement BMP's as required to comply with applicable NDPES Permit requirements and RWQCB regulations, as well as County and City of San Diego procedures, standards, and regulations. As described above, compliance with these requirements would reduce potential Project-related and cumulative impacts to ***less than significant levels***.

**Table 3.2-1**
**Summary of Pre- vs. Post-Development Flows to Lower Otay Lake**

| Condition | Tributary Area (acres) | 100-Year Peak Flow (cfs) |
|---|---|---|
| Pre-Developed | 2,461.8 | 2,871.4 |
| Post-Developed | 2,486.5 | 3,516.9 |
| **DIFFERENCE** | **+ 24.7*** | **+ 645.5** |
| Adjusted Pre-Development | 2,486.5 | 2,900.2 |
| **DIFFERENCE (after adjustment)** | **0** | **+ 616.7** |

Source: Otay Ranch Resort Village Drainage Study, Hunsaker & Associates
* Areas do not match because small changes in alignment and section of Otay Lakes Road and pre-development area draining to culvert 3 not considered in the analysis. Pre-development peak flow proportional to the area in the adjusted area.
cfs = cubic feet per second

**Table 3.2-2**
**Summary of Pre-Development and Post-Development 100-Year Peak Culvert Flows and Upgrades at Otay Lakes Road**

| Culvert # | 100- Year Existing Peak Flow (cfs) and Discharged Velocity (ft/s)* | 100- Year Developed Peak Flow (cfs) & Discharged Velocities (ft/s)** *** **** | Existing Culvert size | Proposed Culvert Size |
|---|---|---|---|---|
| 1A ^ | 43.9 / 11.6 | 46.9 / 10.4 / 11.5 / 10.0 | 24” CMP pipe | 30” RCP pipe |
| 1B ^ | 11.1 / 9.3 | 14.5 / 7.6 / 7.6 / 6.3 | 24” CMP pipe | 24” RCP pipe |
| 2 ^ | 53.7 / 14.7 | 47.97 / 10.3 / 6.8 / 6.8 | 24” CMP pipe | 36” RCP pipe |
| 3 * | Not affected by Development | Not affected by Development | 2 – 10’ x 10’ boxes | Extension of the 2 – 10’ by 10’ boxes |
| 4 ^ | 172.0 / 11.9 | 48.22 / 10.3 / 6.8 /6.8 | 24” CMP pipe | 36” RCP pipe |
| 5 | 48.4 / 13.1 | 0 (diverted to 4) | 24” CMP pipe | none |
| 6 ^ | 194.9 / 13.6 | 436.3 / 17.0 / 15.4 / 15.4 | 24” CMP pipe | 72” RCP pipe |
| 7 ^ | 568.6 / 20.3 | 937.9 / 20.4 / 15.2 / 14.5 | 36” RCP pipe | 8’x10’ Box |
| 8 | 34.4 / 5.2 | 0 (diverted to 7) | 12” CMP pipe | none |
| 9 ^ | 121.9 / 15.6 | 199.9 / 14.1 / 13.8 / 13.3 | 24” RCP pipe | 54” RCP pipe |
| 10 | 18.8 / 8.3 | 0 (diverted to 12) | 21” CMP pipe | none |
| 11 | 10.9 / 10.5 | 0 (diverted to 12) | 18” CMP pipe | none |
| 12 ^ | 22.1 / 15.5 | 20.4 / 8.1 / 8.1 / 7.5 | 18” CMP pipe | 24” RCP pipe |
| 13 | 14.9 / 13.7 | 0 (diverted to 14) | 18” RCP pipe | none |
| 14 ^ | 20.4 / 13.6 | 30.2 / 9.1 / 8.9 / 7.6 | 18” RCP pipe | 30” RCP pipe |
| 15 ^ | 296.5 / 14.5 | 256.3 / 4.8 / 1.2 / 1.5 | 18” RCP pipe | Contech 23A6 |
| 16 ^ | 97.8 / 11.2 | 223.3 / 14.9 / 11.4/ 11.4 | 24” CMP pipe | 60” RCP pipe |
| 16A | 14.2 / 11.6 | 0 (diverted to 16) | 18” CMP pipe | none |
| 17 | 30.6 / 9.8 | 0 (diverted to 16) | 24” CMP pipe | none |
| 17A | 11.0 / 12.6 | 0 (diverted to 16) | 15” PVC pipe | none |
| 18 ^ | 896.5 / 18.7 | 1,198.5 / 14.3 / 11.6 / 9.8 | 66” CMP pipe | Contech 23A6-6 |
| 18A | 16.5 / 7.6 | 0 (diverted to 18) | 18” HDPE pipe | none |
| 19 ^ | 85.4 / 13.4 | 11.7 / 7.4 / 7.1 / 5.8 | 24” CMP pipe | 24” RCP pipe |
| 20 ^ | 86.9 / 10.3 | 44.8 / 10.1 / 9.6 / 8.1 | 9’x5’ Box | 36” RCP pipe |

cfs: cubic feet per second; ft/s: feet per second; CMP: corrugated metal pipe; RCP: reinforced concrete pipe; HDPE: high-density polyethylene

*- Not included in the 23 culverts described under the first hydrology significance guideline that receive runoff from the project site.

^- One of the 14 culverts that would be upgraded by the project described under the first hydrology significance guideline.

**Table 3.2-3**
**Salt Loading Calculations from Urban Runoff to Lower Otay Lake**

| Post-Development Description | Total Area[1] | Pre-Development Condition | | | | | Post-Development Conditions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Type | Area[1] | Avg Year Runoff[2] | TDS Loading[3] | TDS Loading[4] | Type | Area[1] | Avg Year Runoff[2] | TDS Loading[3] | TDS Loading[4] |
| Natural Area not tributary to WQ basin | 1,343 | Natural | 1,343 | 50.5 | 200 | 27,429 | Natural | 1,343 | 50.5 | 200 | 27,429 |
| Natural Area tributary to WQ basin | 333 | Natural | 333 | 12.5 | 200 | 6,789 | Natural | 333 | 12.5 | 200 | 6,789 |
| Developed Area not tributary to WQ basin | 132 | Otay Lakes Rd | 13 | 7.9 | 800 | 17,164 | Pervious | 66 | 6.7 | 800 | 14,556 |
| | | Natural | 119 | 4.5 | 200 | 2,444 | Not Pervious | 66 | 40.0 | 800 | 86,904 |
| Developed Area tributary to WQ basin | 683 | Natural | 683 | 25.7 | 200 | 13,959 | Pervious | 341.5 | 34.9 | 800 | 75,824 |
| | | | | | | | Not Pervious | 341.5 | 207.6 | 800 | 451,032 |
| **TOTAL** | **2,491** | **---** | **2,491** | **101.1** | **---** | **67,785** | **---** | **2,491** | **352.2** | **---** | **662.534** |
| **INCREASE** | | | | | | | | | **251.1** | | **594,749** |
| **OFFSET IMPORTED WATER SUPPLY** | | | | | | | | | **251.1** | **500** | **340,962** |
| **NET EFFECTIVE INCREASE** | | | | | | | | | **251.1** | | **253,787** |

[1] acres
[2] acre-feet (af)
[3] milligrams/liter (mg/l)
[4] pounds

**Table 3.2-4**
**Comparison of Project Percentage of Salt and Nitrogen Loading in Otay Reservoir**

| | Increased Load to Otay Reservoir | Dexter Wilson Engineering, Inc. | City of San Diego[1] | |
|---|---|---|---|---|
| | | 49,850 acre-feet[2] | 40,300 acre-feet[3] | 37,200 acre-feet[4] |
| **Salt (TDS)** | 254,000 lb/yr | 0.4% | 0.5% | 0.6% |
| **Nitrogen** | 1,400 lb/yr | 2.3% | 2.8% | 3.1% |

[1] Per Memorandum from Long-Range Planning and Water Resources Division (February 13, 2012)
[2] Volume of water in reservoir when full
[3] Volume of water in reservoir at average storage from 1980 to 2010
[4] Volume of water in reservoir at 30th percentile storage

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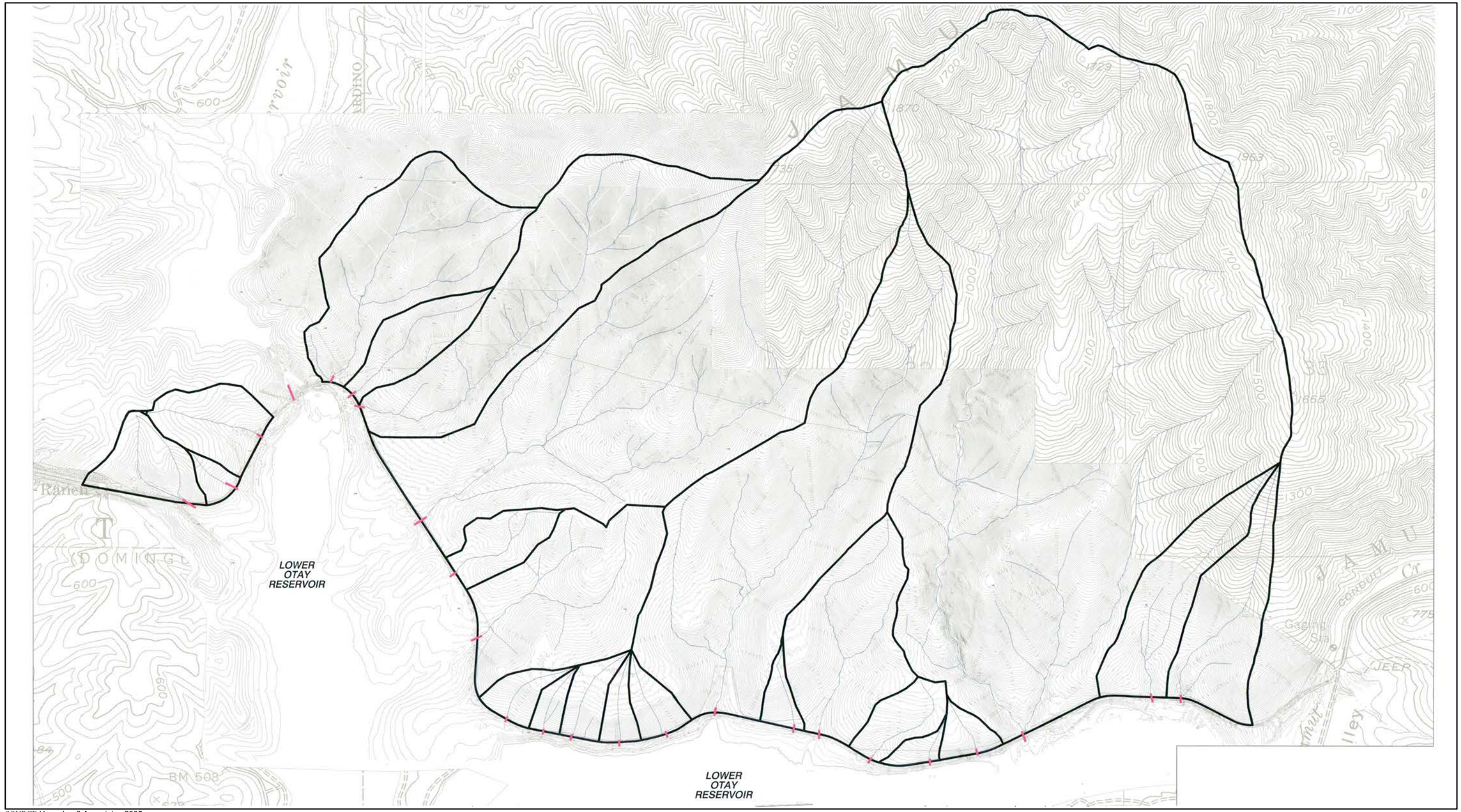


SOURCE:Hunsaker & Associates 2005

No Scale

**Figure 3.2-1**
**Existing Conditions Watershed Map**

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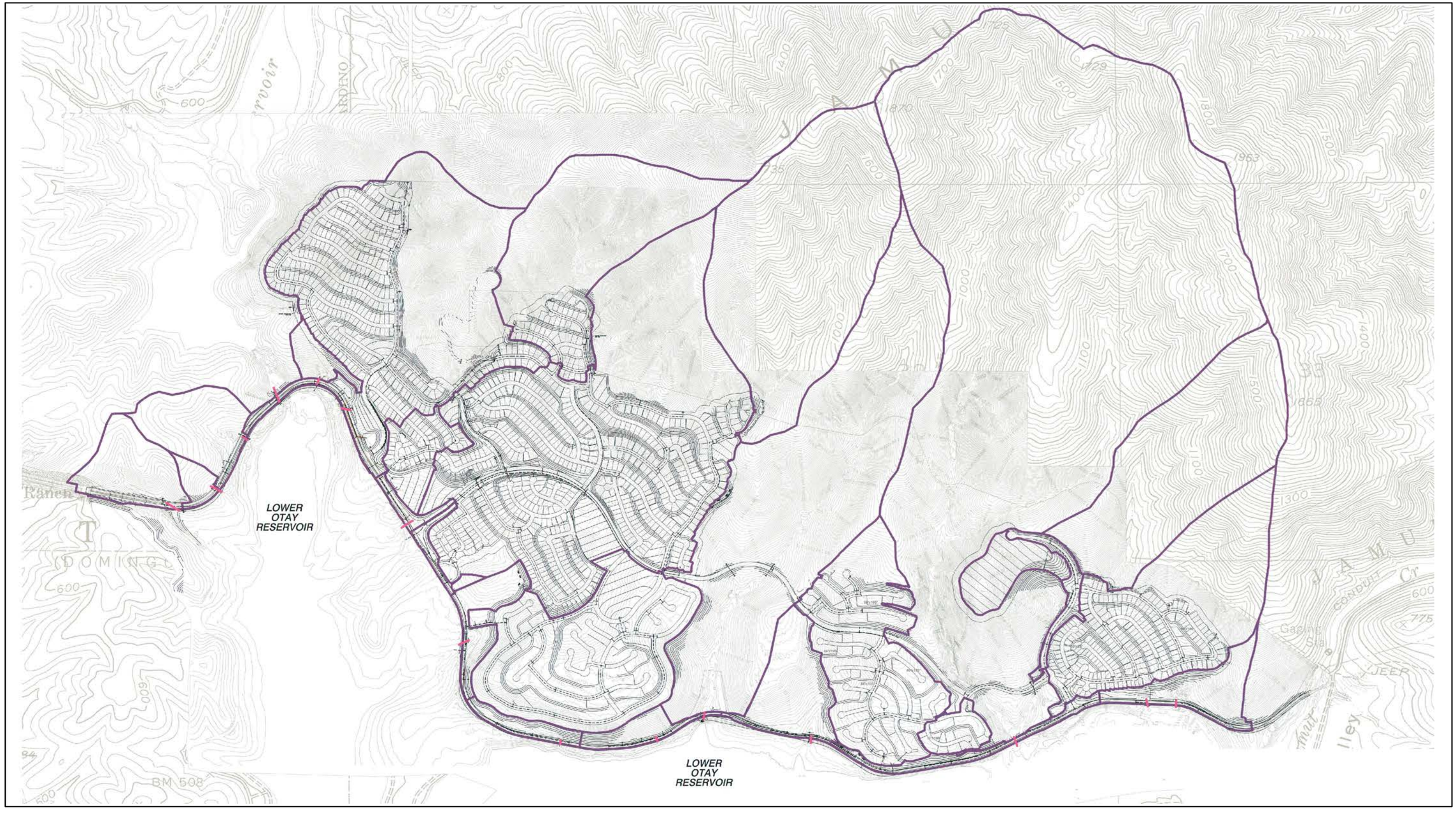


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**Figure 3.2-2**
**Proposed Drainage Areas and Patterns**

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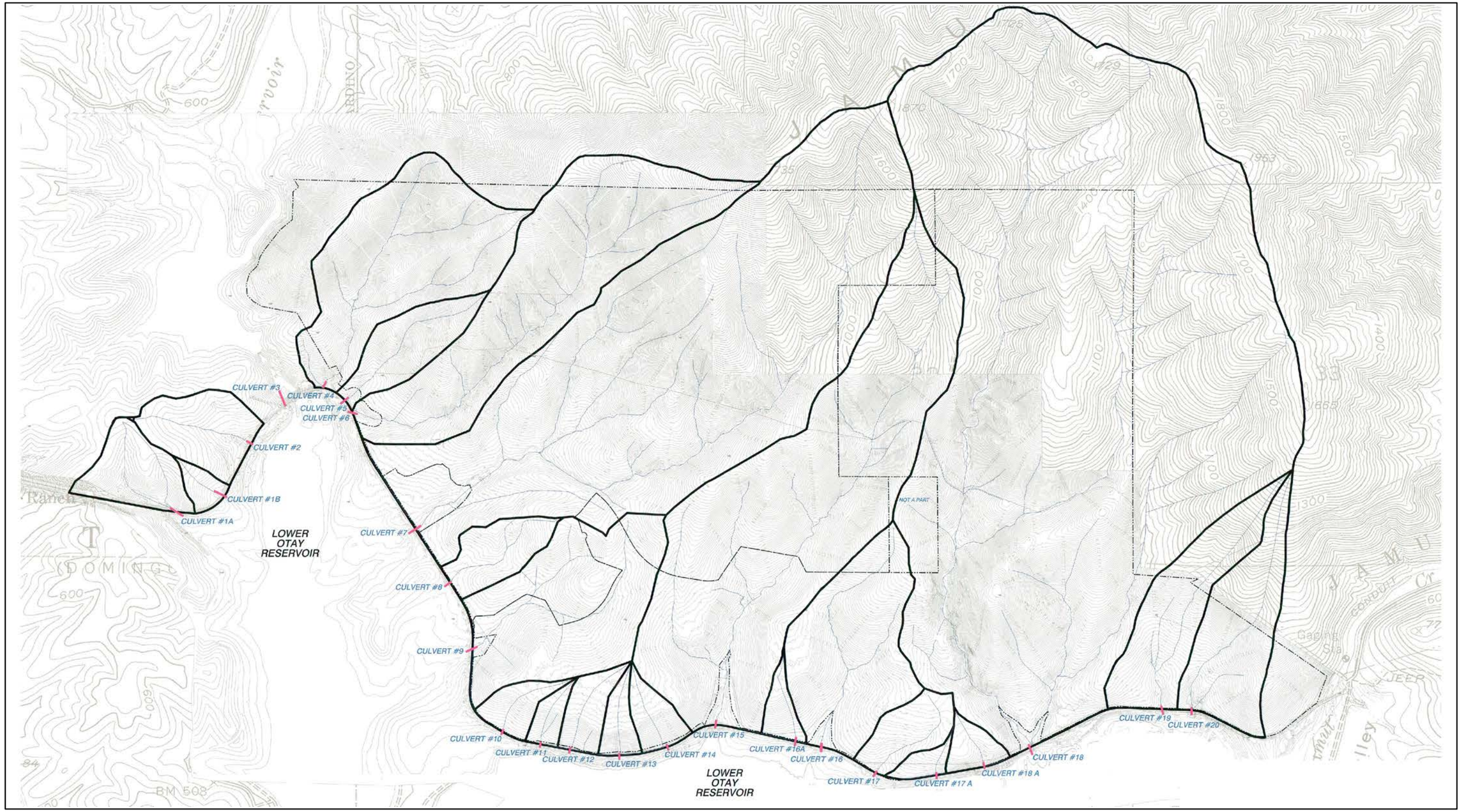


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**Figure 3.2-3**
**Existing Culvert Locations**

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**Figure 3.2-4**
**Proposed Culvert Locations**

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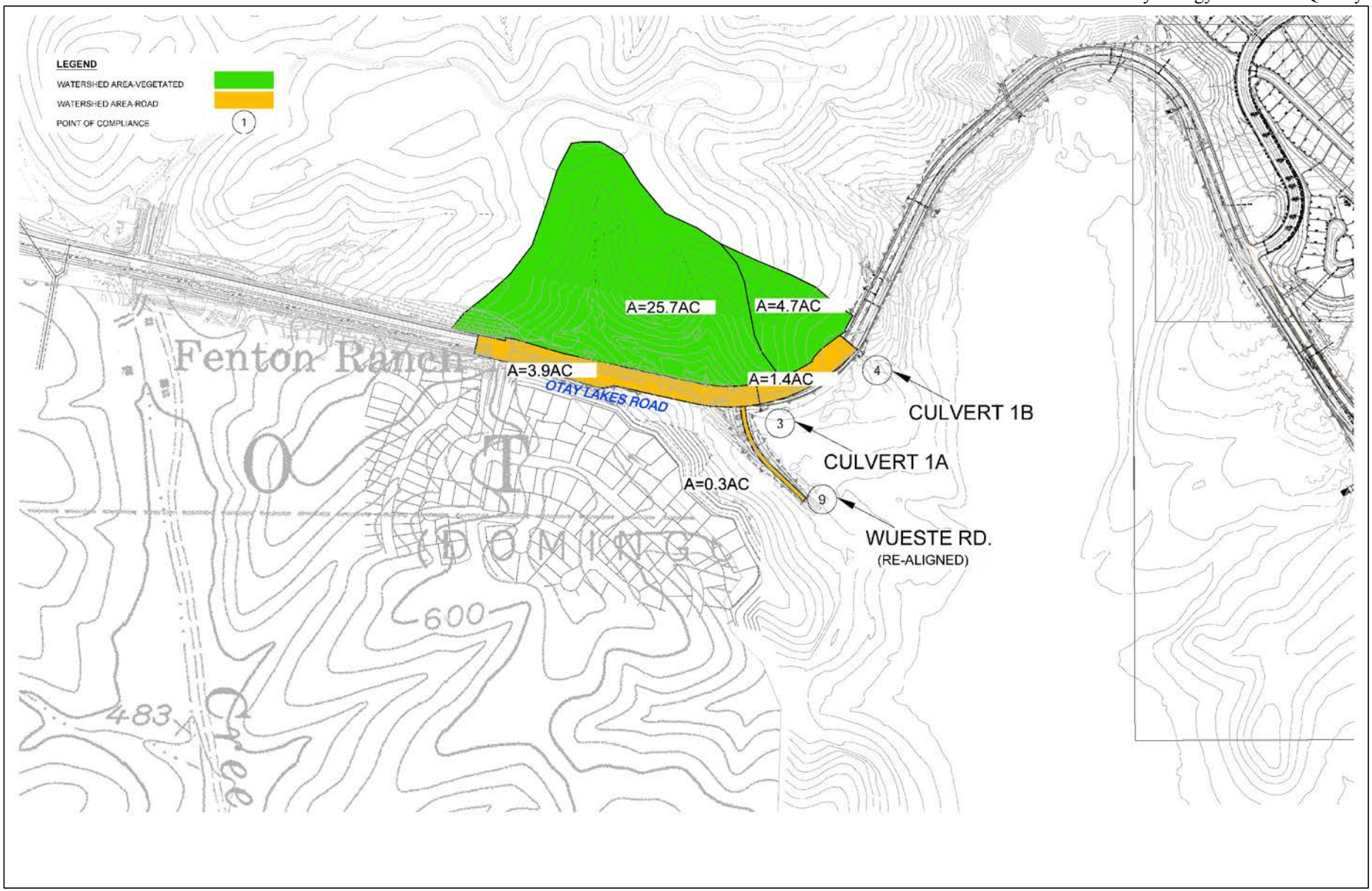
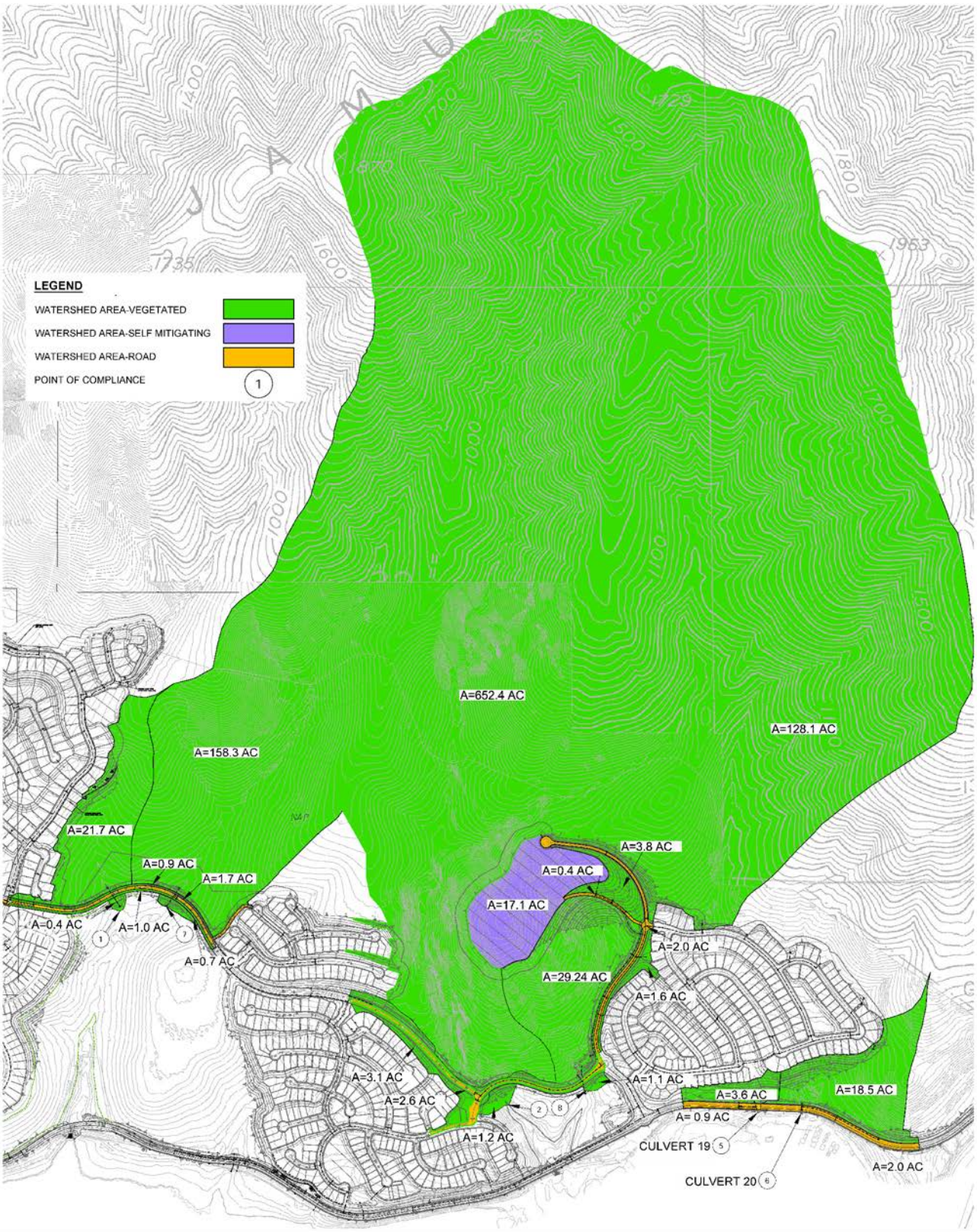



**SOURCE:** Hunsaker & Associates 2014

No Scale

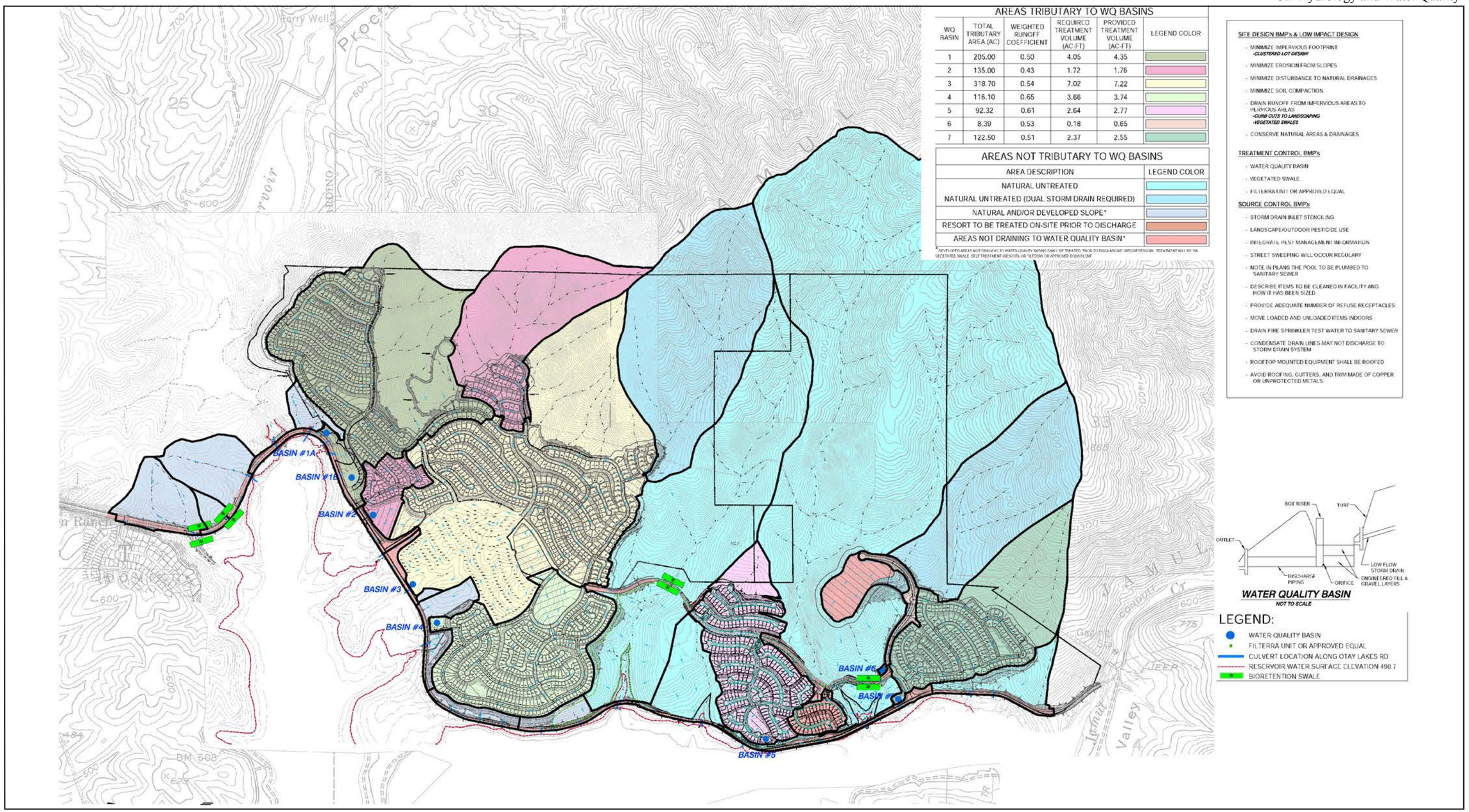
**Figure 3.2-5A**
**Hydromodification Points of Compliance**




**SOURCE:** Hunsaker & Associates 2014

No Scale

**Figure 3.2-5B**
**Hydromodification Points of Compliance**




AREAS TRIBUTARY TO WQ BASINS

| WQ BASIN | TOTAL TRIBUTARY AREA (AC) | WEIGHTED RUNOFF COEFFICIENT | REQUIRED TREATMENT VOLUME (AC-FT) | PROVIDED TREATMENT VOLUME (AC-FT) | LEGEND COLOR |
|---|---|---|---|---|---|
| 1 | 205.00 | 0.50 | 4.05 | 4.35 | |
| 2 | 135.00 | 0.43 | 1.72 | 1.76 | |
| 3 | 318.70 | 0.54 | 7.02 | 7.22 | |
| 4 | 116.10 | 0.65 | 3.66 | 3.74 | |
| 5 | 92.32 | 0.61 | 2.64 | 2.77 | |
| 6 | 8.39 | 0.53 | 0.18 | 0.65 | |
| 7 | 122.50 | 0.51 | 2.37 | 2.55 | |

AREAS NOT TRIBUTARY TO WQ BASINS

| AREA DESCRIPTION | LEGEND COLOR |
|---|---|
| NATURAL UNTREATED | |
| NATURAL UNTREATED (DUAL STORM DRAIN REQUIRED) | |
| NATURAL AND/OR DEVELOPED SLOPE* | |
| RESORT TO BE TREATED ON-SITE PRIOR TO DISCHARGE | |
| AREAS NOT DRAINING TO WATER QUALITY BASIN* | |

* NEVER-DIPPED AREAS NOT DRAINING TO WATER QUALITY BASINS SHALL BE TREATED PRIOR TO DISCHARGE INTO DEPRESSION. TREATMENT WILL BE VIA VEGETATED SWALE, SELF TREATMENT (DESOTO), OR TERRA OR APPROVED EQUIVILENT

SITE DESIGN BMPs & LOW IMPACT DESIGN

- MINIMIZE IMPERVIOUS FOOTPRINT
  *-CLUSTERED LOT DESIGN*
- MINIMIZE EROSION FROM SLOPES
- MINIMIZE DISTURBANCE TO NATURAL DRAINAGES
- MINIMIZE SOIL COMPACTION
- DRAIN RUNOFF FROM IMPERVIOUS AREAS TO PERVIOUS AREAS
  *-CURB CUTS TO LANDSCAPING*
  *-VEGETATED SWALES*
- CONSERVE NATURAL AREAS & DRAINAGES

TREATMENT CONTROL BMPs

- WATER QUALITY BASIN
- VEGETATED SWALE
- FILTERRA UNIT OR APPROVED EQUAL

SOURCE CONTROL BMPs

- STORM DRAIN INLET STENCILING
- LANDSCAPE/OUTDOOR PESTICIDE USE
- INTEGRATE PEST MANAGEMENT INFORMATION
- STREET SWEEPING WILL OCCUR REGULARY
- NOTE IN PLANS THE POOL TO BE PLUMBED TO SANITARY SEWER
- DESCRIBE ITEMS TO BE CLEANED IN FACILITY AND HOW IT HAS BEEN SIZED
- PROVIDE ADEQUATE NUMBER OF REFUSE RECEPTACLES
- MOVE LOADED AND UNLOADED ITEMS INDOORS
- DRAIN FIRE SPRINKLER TEST WATER TO SANITARY SEWER
- CONDENSATE DRAIN LINES MAY NOT DISCHARGE TO STORM DRAIN SYSTEM
- ROOFTOP MOUNTED EQUIPMENT SHALL BE ROOFED
- AVOID ROOFING, GUTTERS, AND TRIM MADE OF COPPER OR UNPROTECTED METALS

**SOURCE:** Hunsaker & Associates 2005

**Figure 3.2-6**
**Treatment Control BMPs**

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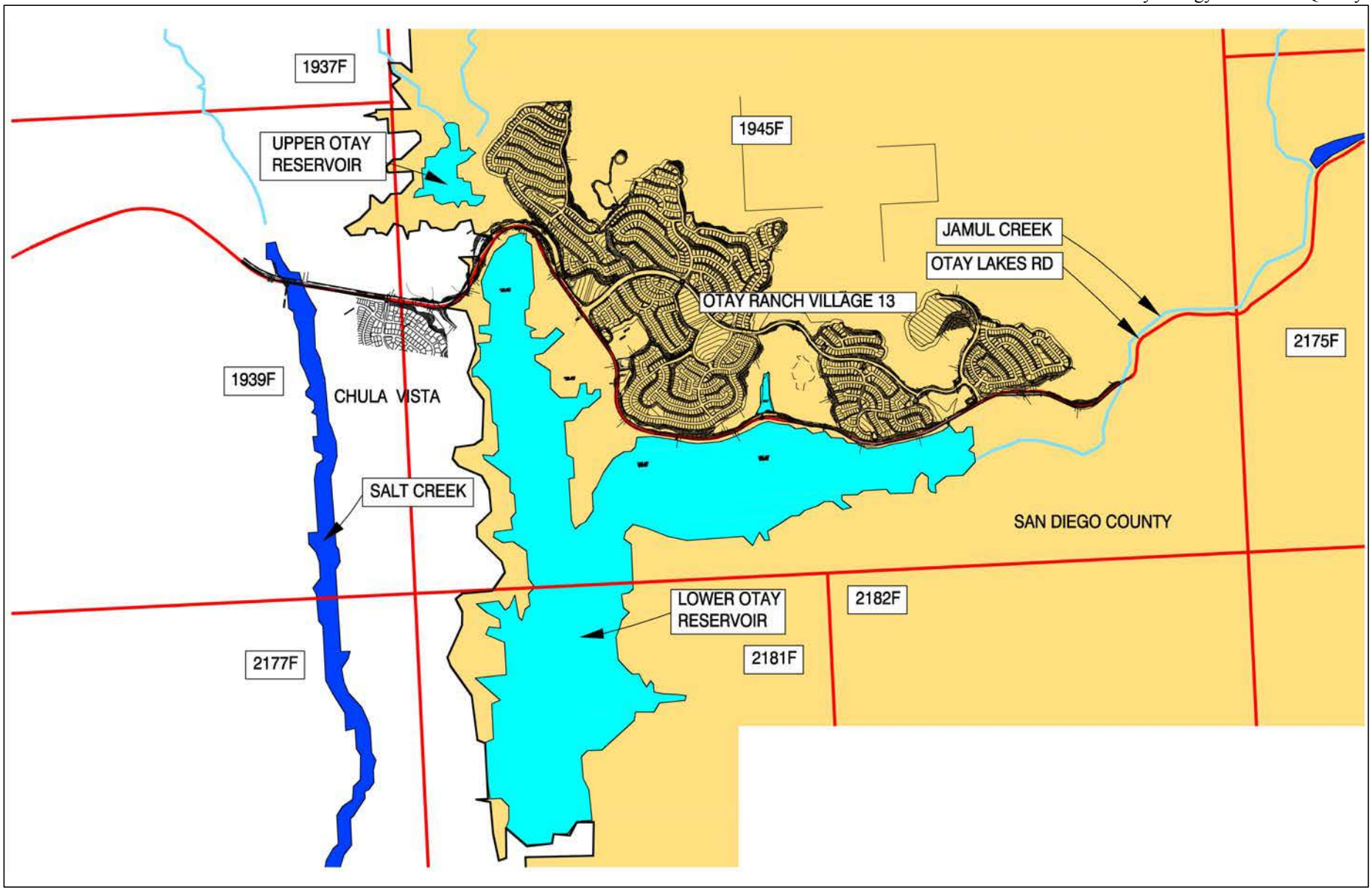


**SOURCE:** Hunsaker & Associates 2005

No Scale

**Figure 3.2-7**
**FEMA Floodplain Map**

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