

6.1 Runoff Management Plan

6.1.1 Existing Conditions

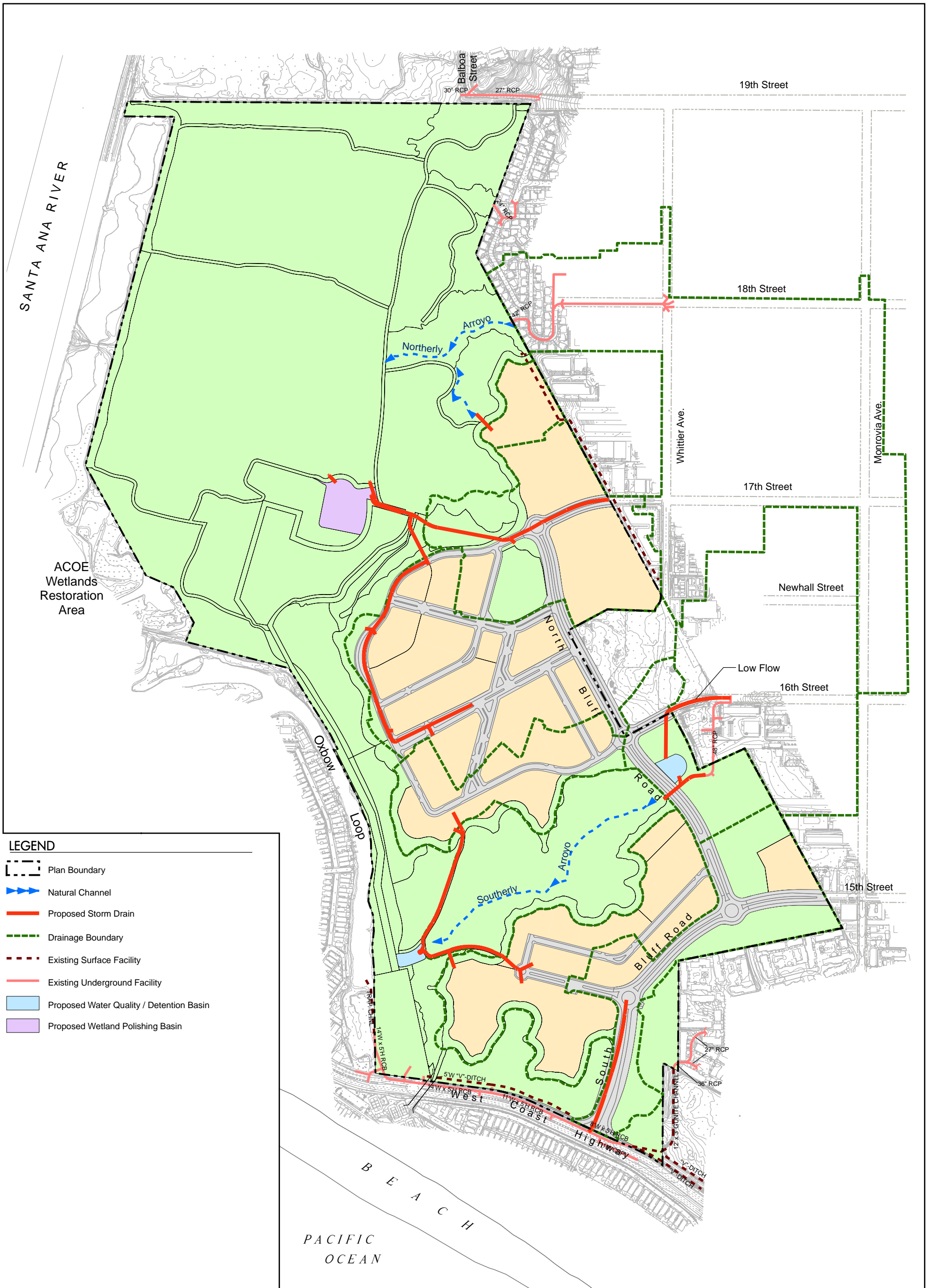
The Site currently receives “run-on” storm flow from the primarily industrial/commercial areas to the east of Newport Banning Ranch. The majority of off-site flow cross the Property in a public storm drain and enters two eroded channels. The upland areas on the Site are tributary to these “gullies,” the adjoining Lowland, and West Coast Highway to the south. The Site currently passes all of its “run off” storm flow overland to these off-site areas, and is consequently subject to erosion, sediment build-up, and debris-laden flows.

6.1.2 Overview

The goal of the Runoff Management Plan is to develop a new drainage and flood control system that will reduce potential downstream flooding impacts, preserve the existing hydrologic conditions of the natural drainage corridors, and provide treatment of low-flow runoff for habitat sustainment.

As illustrated in Exhibit II.6-1, Master Drainage Plan, the Runoff Management Plan accomplishes the following drainage, flood control, and water quality objectives:

1. Reduce existing flow rates and volumes to the Oxbow Loop to reduce the flooding potential within the area of existing development;
2. Match existing project discharge rates into the West Coast Highway storm drain system to minimize impacts downstream;
3. Maximize the routing of storm flows to the lowlands to offset increases in development runoff discharges and volumes to the Large Arroyo and Oxbow Loop;
4. Minimize development runoff to the smaller medium Arroyo to preserve its existing functionality;
5. Provide for treatment of off-site runoff for water quality improvements and reduction of high flow discharges;
6. Implement low-impact development features, infiltration strategies, and integrated water-quality measures into the Project infrastructure and buffer zones to treat water and direct flows to sustain habitat areas;
7. Preserve the existing bluff/slope faces and structure by directing runoff away from them; and
8. Collect and convey existing off-site run-on along the Project’s easterly property line, consistent with existing recorded drainage acceptance agreements.



- LEGEND**
- Plan Boundary
 - Natural Channel
 - Proposed Storm Drain
 - Drainage Boundary
 - Existing Surface Facility
 - Existing Underground Facility
 - Proposed Water Quality / Detention Basin
 - Proposed Wetland Polishing Basin

6.2 Water Quality Management Plan

6.2.1 Existing Condition

The Site currently has no comprehensive or specific water quality measures in place, although the existing oil extraction operates with associated local erosion control and site runoff control. The urban runoff from the existing neighborhoods on the east is delivered to the Site untreated at the east property line.

6.2.2 Overview

As shown in Exhibit II.6-2, Water Quality Management Plan, the Project will deploy a “Treatment Train” approach that focuses specialized features and Best Management Practices in three sequential zones of development: the interior “core” neighborhoods, the transitional zones in the streets and along the perimeter, and the buffer zones along the lowland.

As explained below, the Water Quality Management Plan is divided out into three zones:

- Interior Development Zone;
- Transitional Zone; and
- Edge Buffer Zone.

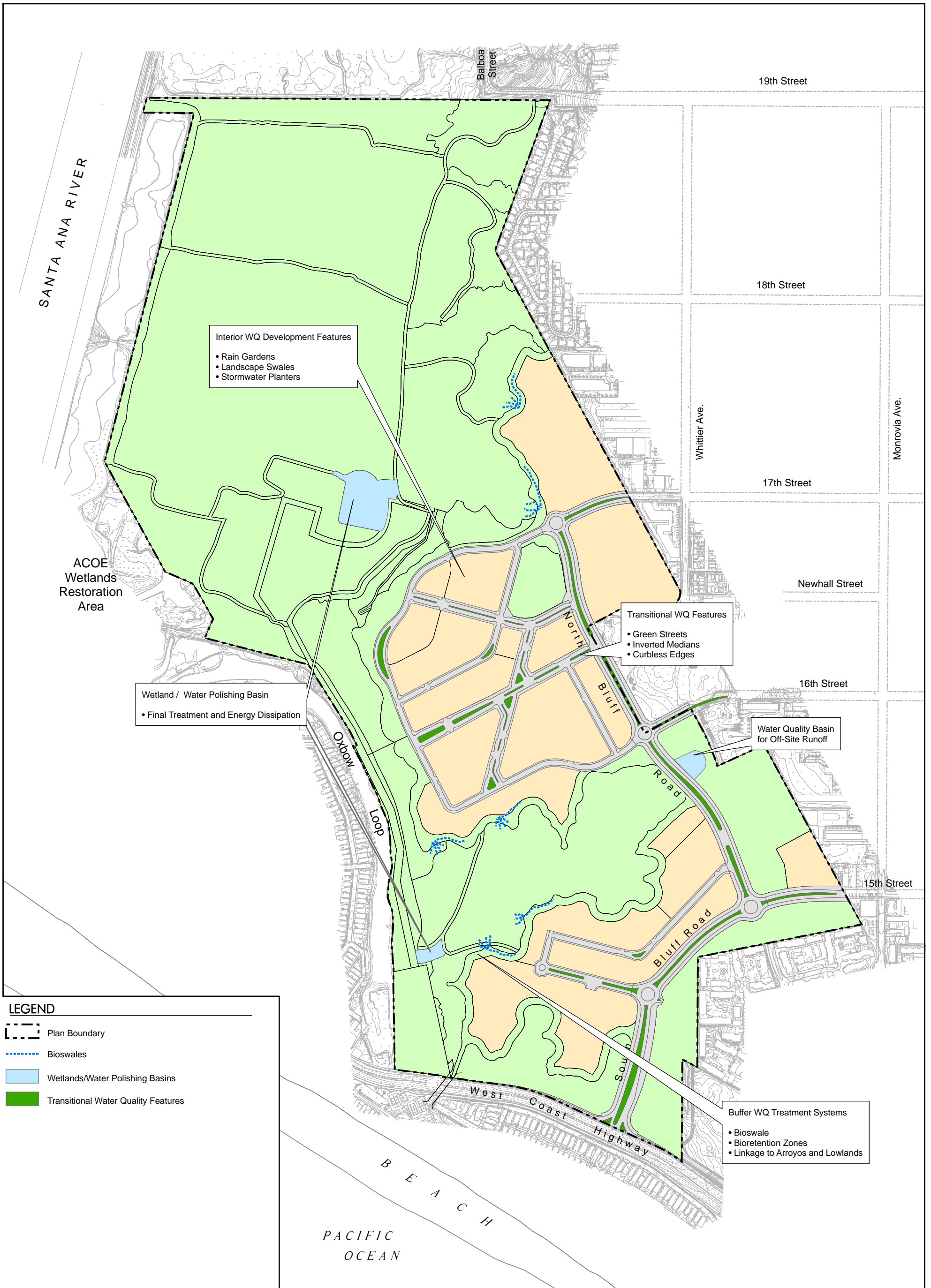
6.2.3 Interior Development Zone

The first stage of water quality protection will begin within the interior of the Project development areas to initiate treatment directly at the source of the runoff. Techniques will include pocket rain gardens, porous/permeable paving integration with traditional impermeable paved areas and landscaped storm water planters. Primary benefits will include runoff reduction for small, more frequent storm events relying on soil-based infiltration processes. The specific details and locations of these measures will be implemented during the design phase and accounted for in the Project-level WQMPs.

6.2.4 Transitional Zone

The transitional zone refers primarily to the streets, walkways, and open spaces that lead into and out of the core residential, resort, and multi-use development areas. Integrating multi-stage pollution controls in the built travelways will reduce the ecological footprint of the Project by providing cleaner water, higher biological value, and greater ecological resilience.

The primary water quality measures deployed here will include the use of curbless edge conditions, bio-swales, hybrid paving surfaces, and infiltration zones within the landscape setback areas, medians and paving sub-surface areas. These “Green Streets” will provide significant water quality treatment flow generated from the streets themselves as well as yards, parks, and open spaces that adjoin them.



6.2.5 Edge Buffer Zone

The last stage of water quality treatment and protection will occur along the development fringes within carefully located buffer zones where a final “polishing through natural processes” occurs. The water quality features planned for these wetland restoration areas include specially planted bio-swales and bioretention zones to further treat runoff previously treated by the interior or transitional water quality features. These systems will include native habitat for water quality pollutant removal and sub-surface designs to mimic natural infiltration processes. Flows will be delivered to these areas through parallel low-flow drainage systems, and treated flows will be collected by sub-drain systems for discharge into local habitat areas or returned to the backbone storm drain systems for delivery to the lowlands and the arroyos.

These systems will combine to serve as the final treatment stage before either discharging into one of the existing drainage corridors or into off-site drainage facilities.

6.2.6 Hydrologic Linkage to Habitat Preservation and Enhancement

The primary focus of the drainage and water quality design is to sustain the long-term channel stability and habitat of the existing drainage corridors and the lowlands. The drainage concept is designed to match flows to existing drainage corridors and receiving water bodies, and to reduce tributary drainage area and flows for those areas where impacts from erosion and flooding have been observed. The water quality concept is designed to distribute treated runoff to restored or protected habitat areas, and to help sustain natural hydrologic flow regimes to these drainage corridors based on site-specific water balance budgets.

6.2.7 Off-Site Runoff Treatment

The water quality design concept incorporates the design and implementation of water quality features to provide treatment of approximately 40 acres of off-site urban (residential and commercial) flows prior to entering the southern Large Arroyo. The treatment and controlled release of these flows represents a significant improvement compared to the current untreated condition.