
3.7 HYDROLOGY

3.7.1 Existing Conditions

Regional Hydrology

The San Diego region has diverse topography predominantly made of a series of mountains, mesas, canyons and valleys that provide for the creation of bays, lagoons, lakes, reservoirs, streams, and rivers. A watershed is considered to be all the area above and below ground that drains into a particular water body. Watershed boundaries follow the major ridgelines around river channels and meet where the water flows out of the watershed, usually the mouth of a stream or river. They come in all shapes and sizes and cross jurisdictional, municipal, county, state, and national boundaries. While watersheds can be large or small, every stream, tributary, or river has an associated watershed.

In San Diego County, there are eleven major watersheds west of the Peninsular Range Mountains. These watersheds all ultimately drain to the Pacific coast. Of the eleven major watersheds, seven are within the jurisdiction of the City of San Diego (**Figure 3.7-1**). They are the San Dieguito, Los Peñasquitos, San Diego, Pueblo, Sweetwater, Otay and Tijuana.

City of San Diego Hydrology

Urbanization within the City of San Diego has required modification of the natural hydrology. This modification has been done predominantly in response to flood risk. A storm water conveyance system has been developed to direct storm water into natural, man-made, or partially modified features. This system of drainage is referred to as the Multiple Separate Storm Sewer System (MS4). Water from rain events within the City of San Diego are carried into the MS4, which then drain into receiving waters such as rivers, reservoirs or bays. The MS4 also directs water into the Pacific Ocean (**Figure 3.7-2**).

The hydrology of San Diego is directly affected by absorption rates, drainage patterns, and the rate of surface runoff. An absorption rate is the time required for pervious ground to absorb rain water. Drainage patterns are the footprint of travel of unabsorbed rain water from high elevations to lower elevations. The rate of surface runoff is how quickly water that is not absorbed travels within a drainage system to receiving water. Urbanization increases surface runoff rates by creating more impervious surfaces such as pavement and buildings. These surfaces do not allow percolation of the water down into the soil. Water is instead forced directly into streams, where erosion and siltation can be major problems, as well as increased flood risks.

Increased runoff also increases water pollution because pathogens that normally would be filtered by soils are also drained to receiving waters, which degrades aquatic habitat. As San Diego becomes an increasingly urbanized area, the management of storm water hydrology becomes essential to maintaining a healthy aquatic ecosystem. In addition, effective storm water

management reduces flood risks and provides for increased health, safety and welfare for the residents of San Diego.

Surface/Receiving Waters

The major receiving waters within the City of San Diego include the Pacific Ocean, San Diego Bay, Mission Bay, the San Dieguito River, Los Peñasquitos Creek, the San Diego River, the Otay River and the Tijuana River. Major reservoirs within or managed by the City include Barrett, El Capitan, San Vicente, Hodges, Miramar, Murray, Lower Otay, Upper Otay, and Sutherland. Additionally there are minor receiving waters made up of creeks, channels, streams and lagoons (**Figure 3.7-2**).

Regulatory Setting

Hydrologic resources are protected under the mandates of numerous federal, state and local jurisdictional laws, regulations, and ordinances and these must be considered in the early planning stages of any project. Future projects implemented under the General Plan will be required to adhere to the requirements of these regulations.

Federal

Clean Water Act of 1972. This Act is the principle law governing pollution control and water quality of the Nation's waterways. The objective of this Act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters (33 U.S.C. 1251). **Section 402** of the Clean Water Act controls water pollution through the National Pollutant Discharge Elimination System (NPDES), by regulating point sources that discharge pollutants into waters of the U.S. Implementation of the act is the responsibility of the Environmental Protection Agency (EPA), which has delegated much of that authority to state and regional agencies.

Executive Order 11988, Floodplain Management. The major requirements of this federal order are to avoid support of floodplain development; to prevent uneconomic, hazardous, or incompatible use of floodplains; to protect and preserve the natural and beneficial floodplain values; and to be consistent with the standards and criteria of the National Flood Insurance Program.

The basic tools for regulating construction in potentially hazardous floodplain areas are local zoning techniques. Proper floodplain zoning can be beneficial in the preservation of open space, retention of floodplains as groundwater recharge areas, and directing of development to less flood-prone areas. No further construction without engineered flood protection has been permitted in the area since July 1976, when the City of San Diego was certified as a participant the National Flood Insurance Program.

State of California

State Water Resources Control Board Construction General Permit, 99-08-DWQ.

Construction activities that disturb one or more acres of land that could impact hydrologic

resources must comply with the requirements of this permit. To be in compliance, the applicant for a construction permit must file a complete and accurate Notice of Intent with the state Water Resources Control Board. Compliance requires conformance with applicable best management practices (BMPs) and development of a Storm Water Pollution Prevention Plan. These prevention plans are to contain a site map(s) which shows the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project.

Local

San Diego County Hydrology Manual. The purpose of this manual is to provide a uniform procedure for flood and stormwater analysis within San Diego County. It provides a guide for policies and procedures based upon the science and data available to attain reasonable standardization of hydrology studies throughout the county.

San Diego County Drainage Design Manual. This manual establishes design standards and procedures for storm water drainage and flood management facilities in San Diego County. These design standards and procedures provide guidance for jurisdictions in the selection, design, construction, and maintenance of storm water drainage and flood management facilities.

City of San Diego Drainage Design Manual. This manual is an appendix to the City of San Diego Land Development Manual. It provides a guide for designing drainage and drainage-related facilities for developments within the City of San Diego.

San Diego Regional Water Quality Control Board (Water Board) Order No. R9-2007-0001, NPDES Permit No. CAS0108758. In February of 2001, under the authority of the Clean Water Act amendments and federal Pollutant Discharge (NPDES) Permit regulations, the Water Board issued the order to the 18 cities within San Diego County, and the Port of San Diego. (This order requires that all jurisdictions within the San Diego region prepare Jurisdictional Urban Runoff Management Plans). Each of these jurisdictional plans must contain a component addressing construction activities and a component addressing existing development.

City of San Diego Jurisdictional Urban Runoff Management Program. This document is a total account of how the City of San Diego plans to protect and improve the water quality of rivers, bays and the ocean in the region in compliance with the Water Board permit referenced above. The document describes how the City incorporates storm water best management practices into land use planning, development review and permitting, City capital improvement program project planning and design, and the execution of construction contracts.

City of San Diego Storm Water Standards Manual. This manual requires that urban runoff pollution issues be specifically addressed in development planning for public and private projects. In addition to considering alternative site design approaches and instituting source controls (i.e. methods to keep pollutants out of contact with storm water), structural treatment devices or storm water Best Management Practices are required.

3.7.2 Thresholds of Significance

A significant impact could occur if implementation of the General Plan:

- Results in changes in absorption rates, drainage patterns, or the rate of surface runoff.

3.7.3 Impact Analysis

Could the implementation of the Draft General Plan result in changes in absorption rates, drainage patterns, or the rate of surface runoff?

Generally, absorption rates, drainage patterns, or the rate of surface runoff has already been modified or established as a result of urbanization throughout the City of San Diego's history of development. In the past, the pattern of development in San Diego has occurred on large vacant tracks of land. Currently, vacant land considered to be developable accounts for 3.6 percent or 6,756 acres of the City's total acreage. Due to the limited amount of vacant land, much of the City's future growth will be in the form of infill and redevelopment. The Draft General Plan calls for future growth to be focused into mixed-use activity centers. Implementation of the Plan would result in infill and redevelopment occurring in selected built areas, which would be identified through the community plan update/amendment process. The Draft General Plan would also guide the development of remaining developable vacant land.

Redevelopment and infill development could have impacts on existing absorption rates, drainage patterns, or the rate of surface runoff. As future development occurs, projects will be evaluated based on their conformance with the updated General Plan, the appropriate community plan and established development regulations. If during redevelopment, the density of the area is intensified, natural vegetated pervious ground-cover could be converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots. Unlike natural vegetated soils, pavement and concrete cannot absorb rainwater. The introduction of new or expanded impermeable surface areas can potentially affect absorption rates, drainage patterns, or the rate of surface runoff.

The General Plan Village Propensity Map identifies areas that already exhibit village characteristics, and areas that may have a propensity to develop as villages due to existing or community plan designated multifamily housing, parks, schools, fire stations, and higher frequency transit routes. Although actual village locations will be determined by forthcoming community plan updates and have not been determined at this time, the Propensity Map identifies areas where village designations are more likely to occur. The Village Propensity map identifies areas of high propensity in the following watersheds: San Dieguito, Los Peñasquitos, San Diego River, Pueblo, Otay, and Tijuana.

Within the Draft General Plan Conservation Element there is policy language calling for management of floodplains to address their multi-purpose use, including natural drainage, habitat preservation, and open space and passive recreation, while also protecting public health and safety. This policy will help avoid impacts by establishing the importance of conserving natural drainage features, and limiting the alteration of existing watersheds. Development, as a result of

plan implementation, will also have to comply with all existing regulations pertaining to existing absorption rates, drainage patterns, or rates of surface runoff. Any development that could potentially alter absorption rates, drainage patterns, or rates of surface runoff would be required to implement design measures to maintain pre-construction flow patterns. Developments that would divert the flow of water from one basin onto another would be required to utilize detention basins that would capture the water from the impacted basin. The detention basin would then slowly release this water into the new drainage basin at a velocity that would be low enough to avoid erosion in the drainage courses of that drainage basin.

Development projects are subject to review by the Development Services Department. Under their review, all projects will be required to be sited and designed to minimize adverse effects on absorption rates, drainage patterns, and rates of surface runoff. In addition, any project that causes impacts to hydrologic resources will be subject to mitigation measures in accordance with the requirements of the City of San Diego and other appropriate agencies. This will be accomplished prior to approval of any discretionary permit. Although the City will work extensively to ensure compliance from all public and private projects, strict enforcement of all applicable regulations may not always be achieved. Therefore, there is potential for significant unavoidable impacts to occur within the project area.

3.7.4 Mitigation Framework

Goals, policies, and recommendations enacted by the City combined with the federal, state, and local regulations described above provide a framework for developing project level hydrological resource protection measures for future discretionary projects. The City's process for the evaluation of discretionary projects includes environmental review and documentation pursuant to CEQA as well as an analysis of those projects for consistency with the goals, policies and recommendations of the General Plan. Future projects must be sited and designed to minimize impacts to absorption rates, drainage patterns, and rates of surface runoff in accordance with City requirements and other appropriate agencies including the San Diego Regional Water Quality Control Board. Such siting and design may include implementation of the mitigation framework measures identified in **Section 3.17.4** (see Water Quality section).

In general, implementation of the above policies and compliance with the federal, state, and local regulations would preclude hydrology impacts. Compliance with the standards is required of all projects and is not considered to be mitigation. However, it is possible that for certain projects, adherence to the regulations may not adequately avoid or reduce impacts, and such projects would require additional measures. These additional measures would be considered for each future discretionary project requiring mitigation (i.e., measures that go beyond what is required by existing regulations). Site-specific measures will be identified that reduce significant project-level impacts to less than significant or the project level impact may remain significant and unavoidable where no feasible mitigation exists. Where mitigation is determined to be necessary and feasible, these measures will be included in a Mitigation Monitoring and Reporting Program (MMRP) for the project.

The generalized Hydrology and Water Quality mitigation measures provided in the EIR may be updated, expanded and refined when applied to specific future projects based on project-specific design and changes in existing conditions, and local, state, and federal laws.

3.7.5 Significance of Impact with Mitigation Framework

At this time, no specific projects have been proposed, and therefore it is not possible to propose feasible mitigation measures to reduce project-level impacts, it is infeasible in this program level EIR to provide specific mitigation that would reduce any future impacts to a less than significant level. As such, significant unavoidable impacts related to absorption rates, drainage patterns, or rates of surface runoff remain.

Notes and References

City of San Diego.

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