

**FACULTY AND FAMILY STUDENT HOUSING,
OPEN SPACE PLAN, & LRDP AMENDMENT EIR**

4.3 HYDROLOGY AND WATER QUALITY

Section 4.3

4.3.1 Introduction

Hydrology
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This section of the EIR describes the existing hydrology and water quality conditions on the University campus and analyzes the potential for implementation of the proposed project to violate any water quality standards or waste discharge requirements, deplete groundwater supplies or interfere with groundwater recharge, alter the existing drainage pattern of the area that would result in substantial erosion or siltation, increase the rate or amount of surface runoff which would result in flooding on or offsite, create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, place housing or other structures within a 100-year flood hazard area, or to expose people or structures to risk of loss, injury, or death involving flooding. Discussion of impacts related to water supply and wastewater treatment is included in Section 4.15 (Public Services) of this EIR.

Information in this section is based on previous reports such as the University North Campus Erosion and Sedimentation Control Plan, the EIR for the North and West Campus Housing LRDP Amendment (Wallace, Roberts, and Todd, 1997), and the Campus Wetlands Management Plan (Davis et al., 1990). This information has been updated with more recent publications and sources, as listed in the References section of this EIR (Section 9.0), as well as air photo interpretation, GIS work, and confirmatory fieldwork performed during July and August 2003. Full bibliographic entries for all reference materials appear in Section 4.3.6 (References) of this EIR.

Seven comment letters and six verbal comments related to hydrology/water quality were received in response to the NOP circulated for the proposed project, including the California Department of Fish and Game (CDFG). The NOP, comments on the NOP, and a summary of issues raised during scoping are included in Appendices A and B of this EIR. The CDFG letter expresses opposition to the elimination or channelization of watercourses. The letter also states that a streambed agreement is required for modification of watercourses.

Additional comments on the NOP included suggestions that the EIR address: 1) siltation and erosion; 2) the potential for floods and tsunamis in the project area and the location Sierra Madre faculty housing in a flood prone area; 3) the effects on drainage resulting from increased density in the area; 4) the viability of underground parking in an area with an extremely high water table; 5) the manner in which construction can be performed as to not increase runoff or any non-point pollution; 6) changes to the water flow through Phelps Ditch (El Encanto Creek) into Devereux Creek and Slough; and 7) public notification as to who is responsible for implementation of runoff measures, grading ordinances, and inspection/ enforcement.

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Section 4.3 **4.3.2 Existing Setting**

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4.3.2.1 Regional Overview of Water Resources and Flooding

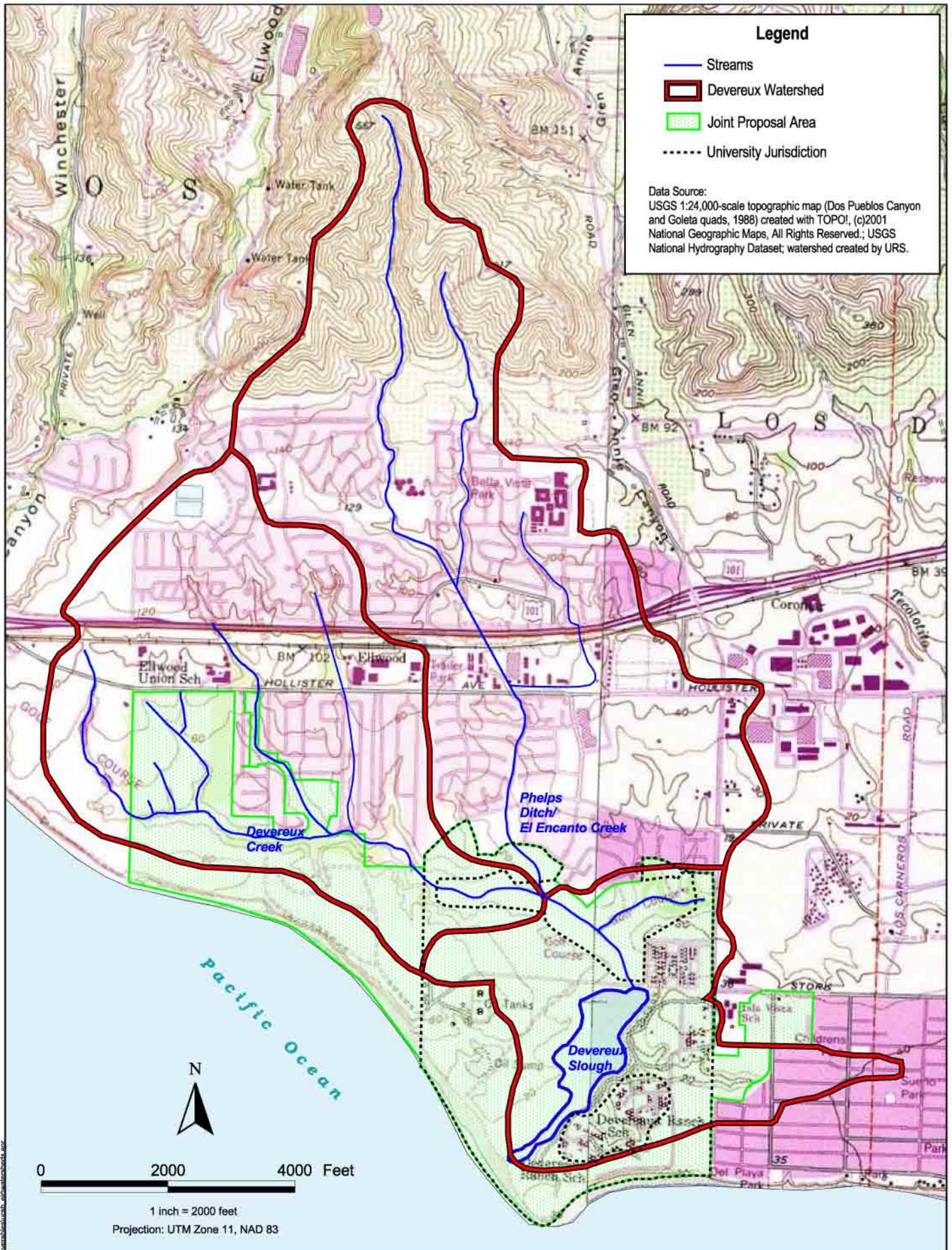
Hydrologic features in the project area include Devereux Creek, which spans the entire area from west to east; tributaries to Devereux Creek that flow from outside the project area (including Phelps Ditch); drainage channels that originate within the Open Space Plan area including a series of man-made drainage channels that flow into Devereux Slough from the University's North Campus South Parcel; the Devereux Slough; extensions of the Devereux Slough near the University's West Campus; and dune ponds within the COPR. In addition, numerous wetland features are present in the project area; wetland features are more fully discussed in Section 4.4 (Biological Resources) of this EIR. This section is based on a review of existing documents with varying levels of detail and confirmatory field observations.

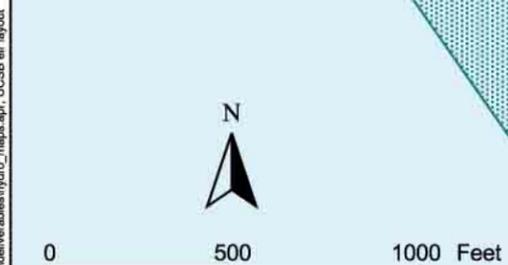
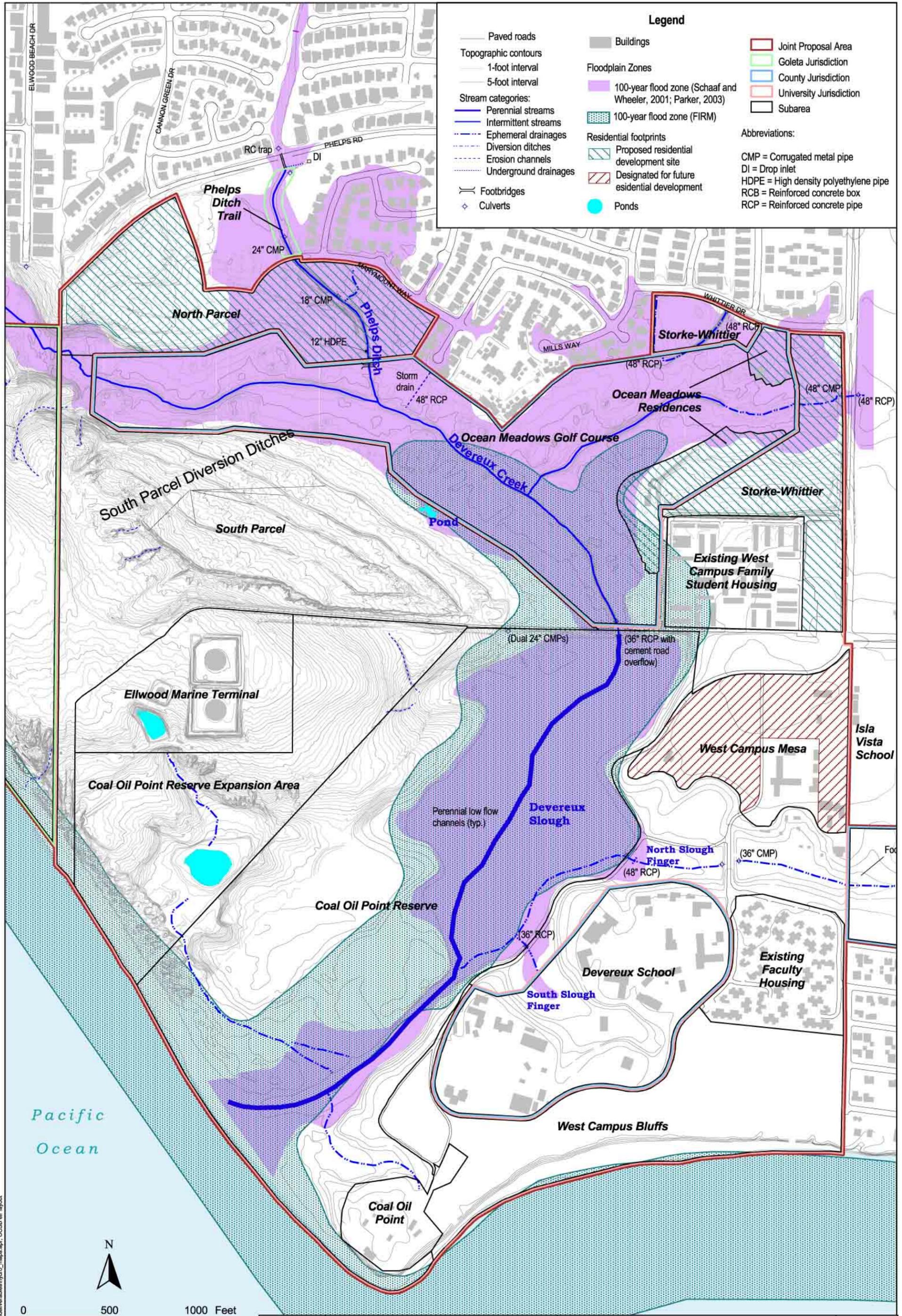
4.3.2.1.1 Devereux Creek Watershed. The project area is in the Devereux Creek Watershed, which is bounded by the foothills of the Santa Ynez Mountains to the north, Storke Road and Isla Vista to the east, the Pacific Ocean to the south, and Ellwood Canyon to the west. Figure 4.3-1 shows the Devereux Creek Watershed areas and the main tributaries to Devereux Creek. The Devereux Creek/Slough Watershed encompasses 2,240 acres, and watershed elevations range from sea level to 580 feet above mean sea level. Lower areas of the watershed generally are urbanized, and the upper reaches consist primarily of native coastal sage scrub and chaparral vegetation and agricultural lands. Approximately 60 percent of the watershed has been developed. Although rainfall averages approximately 15.5 inches near Devereux Slough, the basinwide average is nearly 18 inches. Natural average runoff was approximately 480 acre-feet; however, volume has increased with urban development and exceeds 690 acre-feet per year (Davis et al., 1990).

Within the watershed, stormwater drains from the foothill area downstream toward U.S. Highway 101 through natural tributaries of Devereux Creek. Storm drains convey water under U.S. Highway 101 and the Southern Pacific Railroad through culverts. South of Hollister Avenue, storm flows pass through Sandpiper Golf Course and residential developments through natural drainage channels that flow to the main east-west branch of Devereux Creek. Devereux Creek drains through Santa Barbara Shores, Ellwood Mesa, Ocean Meadows Golf Course, and COPR sub-areas of the Joint Proposal area.

South of the Ocean Meadows Golf Course, Devereux Creek empties into Devereux Slough. The 45-acre Devereux Slough is on land controlled primarily by the University's COPR, with two fingers extending east onto West Campus Mesa and Devereux School. Remnant habitats of a formerly much larger lagoon are located upstream along Devereux Creek.

Figure 4.3-2 shows the hydrologic features in the project area, including 100-year flood hazard areas.





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Section 4.3 Hydrology and Water Quality

Watershed Health. Since the late 1920s, coastal development and industrialization has led to significant decline in general ecosystem health (California Coastal Conservancy, 2001; McGinnis, 2002; National Park Service, 2003). Coastal wetland and estuarine habitats were often seen as a dumping area or a breeding ground for disease-carrying mosquitoes. Federal, state, and local policies to drain, fill, or somehow convert wetlands to more “productive” agricultural and urban land uses were the norm, resulting in widespread direct destruction of wetland habitat. Significant ecological impacts to wetlands continue from historical filling, hydrologic modification including flood control and water supply projects, pollution from point and non-point sources, and introduction of invasive exotic species (California Coastal Conservancy, 2001).

When human activity fragments and severs the connection between coastal watersheds, wetlands, and the marine system, the biological, physical, and chemical processes of fragile wetlands and the marine ecosystems are affected (NOAA, 1999). As these biophysical and chemical processes are changed by coastal developments and other land-use activities, the general health of coastal wetlands, which are considered the nurseries of the sea, is degraded to the point where animals, such as shorebirds, plants, and fishes, decline in abundance and distribution. The U.S. Department of the Interior (Noss, LaRoe and Scott, 1997) notes that every coastal ecosystem of the California coast is either threatened or endangered. Coastal dune habitats, native grasslands, vernal pools, and other coastal habitats are increasingly rare along the south coast.

Notable examples of wetland types that largely have been eliminated in southern California include (California Coastal Conservancy, 2001; National Park Service, 2003):

- Estuarine wetlands (i.e., salt marshes) as an entire subsystem at 75 to 90 percent
- “The riparian community” at 90 to 95 percent
- Vernal pools at 90 percent

Precipitation. Annual precipitation in the project area averages 15.5 inches, with 95 percent falling between November and April. Surface flows can become erosive during the months of January through March when average precipitation rates can reach 3 inches monthly.

Flood Conditions. Extended periods of heavy rainfall from storms originating over the Pacific Ocean can produce floods that are characterized by a rapid rise in stream flow and a recession that is almost as rapid. Streams in the region may be out of their banks for only a few hours or for several days. During winter months, a series of storms or a single, stalled storm has produced large floods, which have damaged property by erosion, flotation, inundation, and depositing debris against bridges and on downstream properties.

As shown on Figure 4.3-2, according to the National FIRM, areas subject to flooding during a 100-year storm include the beach, portions of the Devereux Slough, and the lower reach of Devereux Creek within Ocean Meadows Golf Course. According to the currently adopted

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Section 4.3 FIRM, the 100-year flood inundation area extends approximately 1,200 feet north of the Ellwood Marine Terminal access road to a point approximately 200 feet south of the confluence of Devereux Creek and Phelps Ditch. There are no designated 500-year flood hazard areas in the Joint Proposal area.

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The Federal Emergency Management Agency (FEMA) Floodway map for the site area (1985) shows only the shoreline as a flood hazard area. The County of Santa Barbara (U.S. Army Corps of Engineers, 1979) designates all streams as potential flood areas. Devereux Creek high-water marks for recent years suggest that 2 to 3 feet of runoff water is present during an average rainfall event. Tsunami inundation elevations in the Santa Barbara area are approximately 5.5 feet for a 100-year event and approximately 11 feet for a 500-year event (Houston and Garcia, 1974).

At the request of Santa Barbara County, FEMA commissioned a study of flood conditions in the lower Devereux Creek watershed (Parker, 2003). The 2001 study, performed by Schaaf and Wheeler, used the HEC-2 model to predict 100-year flood conditions in the study area. The results of this study are still under FEMA review and have not been finalized. A creek restoration project in the Ocean Meadows Golf Course section of Devereux Creek, conducted in 2002, has improved drainage in the area and reduced flooding (Penfield and Smith, 2003). These drainage improvements are not accounted for in the Schaaf and Wheeler study. Based on comparisons with other flood inundation studies in the project area (Penfield and Smith, 1996) and field observations, the updated information from the Schaaf and Wheeler study, as well as data from the existing FEMA and FIRM maps, is presented on Figure 4.3-2 for CEQA planning purposes.

Groundwater Setting. The following discussion is a brief summary of regional and site groundwater information based on limited available site data. The Devereux Creek Watershed is on the south limb of a large anticline exposing a thick section of strata of Tertiary age. The strata consist largely of marine sandstone, siltstone, and shale, but beds of terrestrial origin also occur in the section. The chief aquifers presently utilized are the alluvium of Quaternary age and the Monterey Shale, Vaqueros Formation, and Sespe Formation of Tertiary age. In the older undifferentiated formation of Tertiary age, groundwater occurs chiefly in fractures and in beds of loosely cemented sandstone (Miller and Rapp, 1968).

Groundwater recharge to the watershed is derived primarily from the deep infiltration of rainfall. Some recharge, however, is derived by seepage from streams during floodflows and by infiltration of water imported to the area for irrigation.

Groundwater from the mountainous area moves generally southward in the watershed toward the coast at a steep hydraulic gradient. At the barrier formed by the impermeable mudstone of the Rincon Shale unit, groundwater is forced to the surface seasonally and discharges into upstream tributaries (e.g., El Encanto Creek) of Devereux Creek. Groundwater is an important source of seasonal flow to the Devereux Slough, Dune Ponds, and Dune Seep in the COPR.

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Most of the available groundwater data in the project vicinity has been compiled for the Ellwood Mesa area, west of the University's North Campus North Parcel and South Parcel site (Upson, 1951; Hoover and Associates, 1989; County of Santa Barbara, 2000). The groundwater immediately beneath Ellwood Mesa is not part of the Goleta Basin. This groundwater is shallow in depth and locally recharged. Of the 80 test pits, borings, trenches, and hydraulic push borings that have been dug at this site over the past 13 years, the shallow, unconsolidated terrace deposits do not contain groundwater. A monitoring well (MW-1) was drilled in the stream alluvium adjacent to Devereux Creek. The well contained a thin saturated zone perched above the shale bedrock at an elevation of 1 foot above sea level and 19 feet below the local ground surface. In addition to the alluvium, groundwater is also present in the Monterey Shale. The first measurable water produced during well drilling was 120 to 450 feet below the ground surface. The Monterey Shale aquifer had a piezometric head of 79.1 feet below ground surface at MW-3.

Deep groundwater was encountered in 600-foot-deep water wells drilled into the Monterey shale. Groundwater was first encountered in these wells at depths of 120 to 450 feet below ground surface.

Groundwater Quality. Groundwater studies generally are lacking from the University's project site; however, groundwater studies have been conducted at the Ellwood Mesa site. Those studies have shown the overall background water quality to be poor, and it is assumed that groundwater quality under the University lands are of similar quality. The groundwater in the alluvium is highly mineralized, but does not exhibit evidence of hydrocarbon contamination. The shallow unconsolidated terrace deposits, where petroleum-contaminated soils have been found most commonly on the site, are topographically higher than Devereux Creek and do not contain groundwater (Hoover and Associates, 1997).

Native water quality in the Monterey Shale aquifer and the alluvium generally are poor with total dissolved solids (TDS) ranging between 4,800 parts per million (ppm) and 13,000 ppm in the five onsite wells at the end of a 1989 aquifer test. Although recent water quality analyses performed by Hoover and Associates indicate that TDS concentration improved with meteoric recharge (TDS at 5,000 ppm), water quality in the Monterey shale aquifer still does not meet the State of California standard for drinking water (Hoover and Associates, 1989, 1997).

Erosion and Sedimentation. Erosion in the project area generally is moderate except on the University's North Campus South Parcel and on slopes above Devereux Creek in the Ellwood Mesa area, west of and upstream from North Campus. Erosion is especially problematic in several areas where numerous informal trails are located. Much of the resulting sedimentation is deposited in the Devereux Slough. Erosion and sedimentation is also prevalent on bluff trails on the West Campus Bluffs site, although this sediment is deposited on the coast at the base of the bluffs. A further discussion of erosion and sedimentation in the project area is provided in Section 4.2 (Geology and Geologic Hazards) of this EIR.

Surface Water Quality. In the Devereux Creek Watershed, the primary source of water pollution comes from the untreated runoff flowing from the land through storm drains and into

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Section 4.3 Hydrology and Water Quality natural stream courses. This urban runoff may come from rooftops, streets, yards, gardens, open spaces, parking lots, orchards, agricultural fields, animal yards, golf courses, construction sites, and any other surface exposed to rain. Drainages in the watershed collect animal waste, oil and rubber residue from cars, asbestos and metals from brake linings, pesticides, silt, and various types of vegetable matter. These inputs may contain high bacterial counts and viruses, may be toxic to marine life, and can carry garbage and silt that litter the ocean and its beaches and kill or injure marine life. This runoff does not come from a discrete source, such as a pipe, therefore it is regarded as a “nonpoint source discharge.” There are no regulated point source discharges in the Devereux Creek Watershed (EPA, 2003).

The County of Santa Barbara’s Project Clean Water has taken several samples of water quality in the lower Devereux Creek watershed. Between 1999 and 2001, nine samples were taken at Devereux Creek at the upstream end of the culvert underneath the Ocean Meadows Golf Course service road between the Ocean Meadows Golf Course and the Devereux Slough. Analytical results for these samples exceeded applicable water quality standards for pesticides, metals, and bacteria. A summary of samples exceeding applicable water quality standards is provided in Table 4.3-1.

Between 1999 and 2000, four samples were taken at the Phelps Road crossing of Devereux Creek; three samples were taken in Devereux Creek at Coronado Road just upstream of the confluence with the major tributary; and three samples were taken on the major tributary west of this confluence. These samples only tested bacteria loading to the Creek, and all samples exceeded applicable water quality standards (County of Santa Barbara, 2000).

Table 4.3-1. Water Quality Data for Devereux Creek at Ocean Meadows Golf

Constituent	Number of Samples Exceeding Standards	Water Quality Standard	Percent of Detections	Minimum Value¹	Average Value¹	Maximum Value¹
Diazinon (mg/L)	4	0.00000009	44%	0.00008	0.000115	0.00019
Malathion (mg/L)	1	0.0001	11%	0.0001	0.0001	0.0001
Dissolved Mercury (mg/L)	2	0.000012	22%	0.0004	0.00045	0.0005
Total Copper (mg/L)	3	0.009	33%	0.02	0.113	0.23
Total Zinc (mg/L)	3	0.004	33%	0.03	0.053	0.07
Total coliform (MPN ²)	4	1000	44%	41060	191705	241920
E. coli (MPN)	4	400	44%	830	11072	26130
Enterococcus (MPN)	4	104	44%	2046	14261	27550

¹As shown, all test values are equal to or exceed the applicable water quality standard.

²Most probable number assay, based on a series of dilution samples.

Source: Santa Barbara County Project Clean Water 1999-2001 (County of Santa Barbara, 2000).

Scientific evidence has linked storm water runoff with high levels of bacteria in creeks and ocean water. Exposure to these bacteria can pose an increased health risk to humans. During the heavy

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rains of 1995, the Santa Barbara Environmental Health Services Department began testing several local beaches for bacteria (County of Santa Barbara, 2003). If a water sample fails to meet one or more of the health standards, a warning status for the beach is issued. In 371 samples taken at Sands Beach near the mouth of Devereux Slough since 1995, 41 have exceeded one or more of the health standards. Warning statuses are most frequent in February. Three-quarters of warnings occur between December and April.

4.3.2.2 Water Resources and Flooding Setting—North Campus

The University's North Campus includes three potential residential development sites on one legal parcel: the North Parcel site south of Phelps Road and Marymount Way; the South Parcel site south of Ocean Meadows Golf Course; and the Storke-Whittier site south of Whittier Drive and west of Storke Road. Each of the three North Campus sites drains primarily through the golf course to Devereux Creek and then into Devereux Slough. Portions of the site drain as sheet flow directly onto the golf course, but most of the drainage is carried into the Devereux Creek through secondary swales or tributaries. Water resources and flooding conditions for each of these sites is further described below.

4.3.2.2.1 Onsite Drainage Conditions—North Campus. The primary drainage for the North Campus area is Devereux Creek. Devereux Creek flows east to west through gently sloping to flat terrain along the northern boundary of the Ellwood Mesa area, upstream from North Campus. The channel varies in width from approximately 10 feet at the upstream project area boundary to approximately 100 feet at the downstream boundary with the Ellwood Marine Terminal access road near the existing University North Campus Housing site. The width of the ordinary high water mark, used to measure U.S. Army Corps of Engineers' jurisdiction, varies between 6 and 65-foot wide. The configuration of the channel is broadly U-shaped with a relatively level bed and gently sloping sides.

Water flow in Devereux Creek is mostly ephemeral and normally lasts no more than a few days beyond any particular rainfall event; however, some runoff, presumably from upstream landscaping, may occur throughout much of the year. Ponding occurs in the few depressions that exist in the relatively level creek bed, but otherwise standing water normally is not present in the creek. The creek may contain water as late as spring or early summer during years of normal rainfall.

Within the project area, erosion generally is moderate except on the University's North Campus South Parcel and on slopes above Devereux Creek in the Ellwood Mesa area, west of and upstream from North Campus. Erosion is especially problematic in several areas where there are existing trails. Much of the resulting sedimentation is deposited in the Devereux Slough. Erosion and sedimentation is prevalent on bluff trails on the West Campus Bluffs site. A further discussion of erosion and sedimentation in the project area is provided in Section 4.2 of this EIR.

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Section 4.3 **Hydrology and Water Quality** **North Campus—North Parcel Site.** The western half of this site drains east and south through overland flow, shallow ephemeral channels, and a north-south trending highly eroded channel toward Ocean Meadows Golf Course and Devereux Creek. The eastern half of the site generally drains south toward Ocean Meadows Golf Course and Devereux Creek. Areas adjacent to Phelps Ditch drain to Phelps Ditch, a man-made flood control channel that crosses the site and drains into Devereux Creek in the golf course.

North Campus—South Parcel Site. The North Campus – South Parcel site drainage area has been described in previous studies including the December 2001 report titled “University of California, Santa Barbara North Campus – Amendment to the February 1997 Open Space and Habitat and Management Plan, Erosion and Sedimentation Control Plan for the South Parcel,” prepared by Van Atta Associates. The following description is based on excerpts from that report, as well as field observations conducted in August 2003.

The North Campus – South Parcel drainage area contains approximately 68.7 acres between the Ocean Meadows Golf Course to the north and east, the Venoco Access Road to the south, and Ellwood Mesa to the west. The entire area drains southeasterly to two 24-inch corrugated metal pipes (CMPs) under the access road into Devereux Slough. As described in Section 4.2 of this EIR, the soils of the South Parcel are generally fine textured sandy substrate exposed by grading activities to fill Devereux Creek to create the Ocean Meadows Golf Course. Consequently, the remaining surface soils consist of low-permeability marine terrace formations that have become highly eroded. The upper slopes near the Ellwood Marine Terminal were the most severely cut and, thus, have the least water holding capacity and lowest nutrient levels. Because of the soil’s lack of structure and fine, sandy texture, it is easily eroded by wind and water when no vegetation is present. Because of widespread mountain bike and recreation activities, much of this area is barren. A series of diversion ditches were constructed in the early 1970s to channel runoff to Devereux Slough, thereby bypassing the golf course. These ditches quickly eroded into deeper gullies with bare vertical slopes. A debris basin was built, but quickly filled with sediment and now supports a dense thicket of willows.

During large storms, water accumulates on the flat higher portions of the site and runs rapidly off the non-absorptive soils and enters the diversion ditches. As water enters the diversion ditches, it is concentrated into narrow channels with slopes of roughly 1 to 2 percent. The main diversion ditch adjacent to the access road is now deeply incised with bare vertical sidewalls.

Several of the ditches have shallow depressions where willows and other wetland species have colonized. Flowing in a southeasterly direction, the channels collect additional runoff from bare slopes and flat surfaces near the southwest portion of this site. The five diversion ditches converge near the sediment basin where water collects and enters a culvert or breaches the Venoco Access Road and flows into Devereux Slough. Willows have become established at the culvert outfall and now provide riparian habitat.

North Campus—Storke-Whittier Site. On the easternmost portion of the North Campus Storke-Whittier sites, stormwater generally sheet flows into a natural swale and is then conveyed,

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along with runoff from east of Storke Road, through the golf course and into Devereux Creek. The Sierra Madre portion of the site, along Whittier Drive, receives runoff from the residential area to the north through a 48-inch reinforced concrete pipe (RCP) under Whittier Drive. Flow from this pipe travels through an approximately 10-foot-wide by 6-foot-deep earthen channel and is supplemented by overland flow from the site as it is conveyed to the golf course.

4.3.2.2.2 Flooding Conditions—North Campus. Flooding in the project area generally is confined to established channels in Devereux Creek. Observed high water marks for Devereux Creek in the Ellwood Mesa sub-area suggest that high flows during normal rainfall events do not exceed 2 to 3 feet in depth (ESA, 1992). According to recent flood studies, portions of the North Campus – North Parcel site, as well as the adjacent Goleta Union School District site, are susceptible to flooding on much of the property surrounding Phelps Ditch. The County has designated the creek channel as a potential flood area (ESA, 1992). Figure 4.3-2 shows 100-year flood inundation areas as modeled by the Schaaf and Wheeler study.

4.3.2.3 Onsite Drainage and Flooding Conditions—West Campus Mesa

4.3.2.3.1 Onsite Drainage Conditions—West Campus Mesa. The West Campus Mesa sub-area is bounded on the north by the Venoco Access Road and the existing University family student housing neighborhood. To the south lie the northern finger of Devereux Slough, Devereux School, and the West Campus Point faculty housing neighborhood. The majority of the West Campus Mesa sub-area drains to the Northern Finger of Devereux Slough. The hydrology of the Northern Slough Finger Area was examined by Davis et al. (1990) as part of the Campus Wetland Management Plan. Their findings are summarized in this discussion. The watershed for the Northern Slough Finger Area is 102 acres, 55 of which are grassland. The wetland is 0.6 to 9 feet above mean sea level.

The North Slough Finger wetlands are influenced strongly by freshwater storm runoff. Standing water, either of palustrine or estuarine origin, infrequently inundates the area. Connection with the main slough is through a 48-inch RCP culvert under Devereux Road. Although tidal water exchange is through this culvert, estuarine water rarely enters the slough finger, due to sediment deposits at the lower end of the slough, and when it does enter, it influences only the lower portions of the wetland (Ferren et al., 1987).

The fragmentation of the western, lower portions of the slough finger from portions to the east is accentuated by the remains of an impoundment and by a large berm formed by the raised roadbed for West Campus Lane. A 36-inch CMP under this road connects the lower and upper watershed basin.

Salinity in the North Slough Finger is lower than would be expected based on the area's proximity to Devereux Slough. Davis et al. (1990) attribute the low salinity to the influences of subsurface flow of fresh water from the watershed.

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Section 4.3 University Family Student Housing generally drains by sheet flow to the west and south, with runoff going into Devereux Slough. A small area in the northeastern portion of the site drains to the north and east toward the El Colegio/Storke Road intersection. Near the intersections of Devereux Road, Storke Road, and El Colegio Road, the Garden Area drains west to Devereux Slough. A small seep occurs at the northwest corner of this area. The southernmost portion of the West Campus Mesa sub-area drains south to the West Campus Bluffs.

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4.3.2.3.2 Flooding Conditions—West Campus Mesa. Figure 4.3-2 shows 100-year flood inundation areas as modeled by the Schaaf and Wheeler study. In the West Campus Mesa sub-area, flooding generally is confined to a portion of the North Slough Finger. In the COPR sub-area, flooding generally is confined to Devereux Slough. In the North Campus sub-area, the eastern half North Campus Faculty Housing site and the northern half of the North Campus Student Family Housing Site along Storke Road and Whittier Drive would be largely inundated by the modeled 100-year event.

4.3.2.4 Water Resources and Flooding Setting—West Campus Bluffs

The 37.2-acre West Campus Bluffs sub-area (refer to Figures 4.3-1 and 4.3-2) predominantly drains overland southward to the ocean. The subsurface clay layers of the soils in the West Campus Bluffs sub-area have low permeability and collect water in topographic depressions during rainy periods. The western section of the West Campus Bluffs sub-area adjacent to Devereux Slough drains westward to the slough. An unnamed drainage collects surface flows from north of Coal Oil Point and south of the Coal Oil Point parking lot; it drains westward toward the slough.

4.3.2.5 Water Resources and Flooding Setting—Coal Oil Point and COPR

4.3.2.5.1 Coal Oil Point. Coal Oil Point is a 6.1-acre headland bounded on the west by the COPR, north and east by the West Campus Bluffs, and the south by the beach. The southern half of the site drains southward to the beach. The northern half of the sub-area drains to an unnamed channel in the West Campus Bluffs that flows west toward Devereux Slough (Figures 4.3-1 and 4.3-2). In addition, fifteen shallow basins have been excavated (located north of the existing Coal Oil Point parking area) as part of a vernal pool restoration project that began in 1985 (Ferren and Pritchett, 1988). Additional information regarding the vernal pool restoration site is provided in Section 4.4 (Biological Resources) of this EIR.

4.3.2.5.2 Coal Oil Point Reserve. Devereux Slough is approximately 45 acres in size (Bennet, 1972). Devereux Creek, the remains of once more extensive wetlands to the north, enters the slough from the north. The slough empties into the Pacific Ocean through a tidal channel and narrow lagoon that frequently is closed by a sand berm. The berm periodically breaks and rebuilds over the course of several weeks. Devereux Slough wetlands are characterized by a more complex pattern of inundation than other wetlands of the region. The wetlands are influenced strongly by freshwater runoff and only occasional tidal circulation. The basic pattern is one of closure to tidal circulation most of the time. When freshwater runoff is

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sufficient to breach the sand berm at the mouth of the estuary, the whole slough empties rapidly. The slough then moves into a period of days to weeks of tidal circulation through the entry channel until the sand berm rebuilds and seals the mouth. Thus, the salinity and inundation regimes vary over a period of days and are quite different from other regional and southern California estuarine wetlands that tend to be more marine influenced. This variability adds to the spatial and temporal complexity of the habitat, which is reflected in the highly diverse bird communities that use the area. These habitat aspects are discussed more fully in Section 4.4 (Biological Resources) of this EIR.

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Devereux Slough experiences a greater inflow than it did prior to urbanization of its watershed. The Campus Wetlands Management Plan calculated that runoff in the Devereux Creek Watershed had increased an average of 44.3 percent over the previous 46 years (Davis et al., 1990). This increase of over 200-acre feet annually could be affecting slough dynamics adversely by increasing beach barrier breakouts.

In addition to Devereux Slough, hydrologic features of the COPR area include a dune swale pond, a dune seep, and created vernal pools on the western mesa top (Figures 4.3-1 and 4.3-2). The dune swale pond is connected to the Slough when water level in the Slough is greater than 5.6 feet above mean sea level. When connected, the pond increases the Slough storage capacity substantially. Groundwater is an important source of perennial and seasonal flow to Devereux Slough, Dune Pond, and Dune Seep in the COPR.

4.3.3 Regulatory Framework

4.3.3.1 Federal

4.3.3.1.1 Flooding. Congress acted to reduce the costs of disaster relief by passing the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. The intent of these acts was to reduce the need for large, publicly funded flood control structures and disaster relief efforts by restricting development in floodplains (California Department of Water Resources, 1980).

The FEMA administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in a floodplain. FEMA issues Federal Insurance Rate Maps (FIRMs) of communities participating in the NFIP. These maps delineate flood hazard zones in the community.

4.3.3.1.2 Stormwater Discharges. Stormwater discharges to waters of the U.S. are regulated under the Clean Water Act §402, 33 USC §1342; 40 CFR Parts 122 – 136. In the project area, this requirement is regulated by the RWQCB – Central Coast Region under the NPDES program. Additional discussion of state implementation of this federal regulation appears in Section 4.3.3.1.1 of this EIR.

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4.3.3.1.3 Discharge of Dredge or Fill Material. Discharge of dredge or fill material into waters of the U.S. (i.e., wetlands, including Devereux Creek and/or Slough) are regulated under Section 404 of the Clean Water Act of 1977. Such activities would require a 404 Permit from the U.S. Army Corps of Engineers as well as an associated Section 401 Water Quality Certification from the RWQCB – Central Coast Region. Section 4.4.2 (Biological Resources, Existing Conditions) of this EIR contains further information about this permitting.

4.3.3.2 State

4.3.3.2.1 Stormwater Discharges. In 1992, the California State Water Resources Control Board (SWRCB) adopted a General Construction Storm Water Permit, which requires landowners to file a Notice of Intent to discharge stormwater runoff to waters of the United States from land disturbances greater than 5 acres. In March 2003, this threshold was reduced to one acre. The permit generally requires dischargers to eliminate non-stormwater discharges to stormwater systems, develop and implement a Storm Water Pollution Prevention Plan (SWPPP), and perform inspections of stormwater pollution prevention measures. Because the University’s proposed project would disturb an area greater than one acre in size, the University would be required to file a Notice of Intent to comply with the National Pollutant Discharge Elimination System (NPDES) general construction activities stormwater discharge permit from the SWRCB, and develop and implement a SWPPP.

A Storm Water Management Plan (SWMP) for the University has been prepared in response to requirements of the Draft General Phase II Small MS4 Activities Storm Water Permit (Draft General Permit) that addresses six minimum control measures, including: 1) public education and outreach; 2) public participation/involvement; 3) illicit discharge detection and elimination; 4) construction site stormwater runoff control for sites greater than one acre; 5) post-construction stormwater management in new development and redevelopment; and 6) pollution prevention/good housekeeping for operations. The Draft General Permit requires applicable dischargers to prepare and implement a SWMP in order to reduce the discharge of pollutants to the “maximum extent practicable”(MEP), protect water quality, and satisfy the appropriate water quality requirements of the Clean Water Act, and RWQCB Basin Plan. The University would be required to file a Notice of Intent to comply with the NPDES general construction activities stormwater discharge permit from the SWRCB, and develop and implement a SWPPP for individual construction projects that would result in the disturbance of one acre or more.

4.3.3.2.2 Prohibited Discharges. The Clean Water Act (§311; 33 USC §1321; 40 CFR Parts 110, 112, 116, 117) requires the reporting of any prohibited discharge of oil or hazardous substance. In the project area, this requirement is regulated by the RWQCB – Central Coast Region and the Santa Barbara County Office of Emergency Services (with oversight provided by the U.S. Environmental Protection Agency [USEPA] Region IX).

4.3.3.2.3 Wastewater Discharge. The campus is not identified as a point source for wastewater discharge and thus is not subject to specific Waste Discharge Requirements (WDRs) related to wastewater discharge. The quality of effluent discharged from the Goleta West

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Sanitary District is established by the Central Coast Regional Water Quality Control Board through an NPDES permit that specifies WDRs. Operation of the waste treatment plan is also subject to regulations set forth by the California Department of Health Services (DHS) and State Water Resources Control Board.

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4.3.3.2.4 Streambed Alteration. Activities within a streambed would require a Streambed Alteration Agreement (Section 1600) from the CDFG. Section 4.4.2 of this EIR contains further information about these agreements.

4.3.3.3 Local

Because the area is in the coastal zone, County policies for the area were reviewed and adopted by the California Coastal Commission. The policies, including the Goleta Community Plan (GCP), which was adopted by Santa Barbara County in 1993, have been incorporated into the County's Local Coastal Plan and were adopted by the California Coastal Commission in January 1994. Although lands under the University's jurisdiction are not subject to local jurisdiction and the GCP, the University reviewed the GCP policies for general consistency with the proposed LRDP Amendment. Refer to Section 4.6 (Land Use) for a discussion of consistency with GCP Policies.

4.3.4 Project Impacts and Mitigation

4.3.4.1 Methodology

By comparing existing land uses to those that are proposed, potential impacts that could result from implementation of the proposed project were evaluated, including the potential to violate any water quality standards or waste discharge requirements; deplete groundwater supplies or interfere with groundwater recharge; alter the existing drainage pattern of the area that would result in substantial erosion or siltation; increase the rate or amount of surface runoff which would result in flooding on or offsite; create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; place housing or other structures within a 100-year flood hazard area; or expose people or structures to risk of loss, injury, or death involving flooding.

Impacts to surface and groundwater quality were analyzed by reviewing existing groundwater and surface water quality literature that pertains to the campus; identifying existing on-campus ground and surface waters, including the depth to groundwater; and evaluating existing and potential sources of water quality pollutants based on the types of land uses and operational activities that occur or could occur on campus. Additionally, the applicability of federal and state regulations, ordinances, and/or standards to surface and groundwater quality of the project area and subsequent receiving waters was assessed. Potential impacts from implementation of the proposed project were determined by evaluating the potential of residential development and open space improvements to exceed the thresholds of significance outlined below.

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Section 4.3 4.3.4.2 LRDP Policies

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The Coastal Act Element of the LRDP included a range of policies and standards (herein termed LRDP policies) to demonstrate consistency of the LRDP, and projects implemented under the LRDP, with the statutory requirements of Chapter 3 of the Coastal Act (commencing with Section 30200). The following LRDP policies are relevant to Hydrology and Water Quality.

30230.1. Development in Coal Oil Point Natural Reserve will be kept to a minimum. Only structures that would be used in conjunction with research in the Reserve, or that would enhance the area's usefulness as a natural study area will be allowed, such as weather stations, observation blinds, and small storage structures.

30230.2. The University shall coordinate with and encourage action by the County of Santa Barbara, City of Santa Barbara, and the RWQCB to see that adjacent land uses are established and carried out in a manner which will sustain the biological productivity of campus marine resources.

30231.1. In order to protect identified campus wetlands, environmentally sensitive habitat areas, and coastal waters from sediment transfer or contamination from urban runoff during construction, the following grading and erosion control practices shall be followed:

- a) North and West Campus construction periods shall be scheduled during the dry months of the year (May through October) whenever possible;
- b) If grading occurs during the rainy season (November through April), sediment traps, barriers, covers, or other methods shall be used to reduce erosion and sedimentation.
- c) A site-specific erosion control and landscape plan shall be prepared for all new construction.
- d) Whenever practical, land on the North and West Campus is to be developed in increments of workable size which can be completed during a single construction season: erosion and sediment control measures are to be coordinated with the sequence of grading.
- e) Excavated materials shall not be deposited or stored where the material can be washed away by high water or storm runoff.
- f) Grading operations on campus shall be conducted so to prevent damaging effects of sediment production and dust on the site and on adjoining properties.
- g) When vegetation must be removed on campus, the method shall be one that will minimize the erosive effects from the removal.
- h) Exposure of soil to erosion by removing vegetation shall be limited to the area required for construction operations. The construction area should be fenced to define project boundaries.
- i) Removal of existing vegetation on campus is to be minimized whenever possible.

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- j) Temporary mulching, seeding, or other suitable stabilization measures shall be used to protect exposed areas during construction or other land disturbance activities on campus.
- k) Topsoil removed from the surface in preparation for grading and construction on-campus is to be stored on or near the site and protected from erosion while grading operations are underway, provided that such storage may not be located where it would cause suffocation of root systems of trees intended to be preserved. After completion of such grading, topsoil is to be restored to exposed cut and fill embankments of building pads so as to provide a suitable base for seeding and planting.
- l) Slopes, both cut and fill on campus, shall not be steeper than 2:1 unless a geological and engineering analysis indicates that steeper slopes are safe and erosion control measures are specified.
- m) Slopes on campus shall not be constructed so as to endanger or disturb adjoining property.
- n) Sediment basins, sediment traps, or similar sediment control measures shall be installed before extensive clearing and grading operations begin for campus development.
- o) Neither wet concrete, nor slurries thereof, shall be permitted to enter any campus wetlands.

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30231.2. Projects shall be designed to minimize soil erosion and, where possible, to direct surface runoff away from coastal waters, environmentally sensitive habitat areas, and wetlands, according to the following policies:

- a) West and Storke Campus site development is to be accomplished, whenever feasible, in a manner that will maximize percolation and infiltration of precipitation into the ground.
- b) During campus development, sediment shall be retained on the site.
- c) The University shall work with property owners adjacent to the West Campus and Santa Barbara County to ensure that development of such properties does not introduce sedimentation into the West Campus marsh, to the maximum extent feasible.
- d) Projects shall be designed to conduct storm water drainage away from Devereux Slough and Storke Campus Wetlands, whenever feasible.
- e) If storm water can only be feasibly discharge into campus wetlands, it shall comply in all respects to all applicable standards of the RWQCB.
- f) At Coal Oil Point, if percolation is determined through tests to be inadequate, to prevent bluff top erosion, storm waters will be collected and drained directly to the ocean by means of pipes discharging at the base of the bluffs.
- g) Runoff from new development and the planned parking lot at Coal Oil Point shall be directed to the east-facing bluff on the Point, and the drainage structures integrated with the planned stairway to the beach, if feasible. Traps and filters for roadway contaminants shall be provided as part of the drainage structures.

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- h) New development adjacent to the required 100-foot building setback surrounding the upland limit of the wetland shall not result in significant adverse impacts due to additional sediment, nutrients, pollutants, and other disturbants.
- i) All sewage from campus development shall be disposed of in sanitary sewer lines or approved septic tank system subject to design and performance requirements of the RWQCB.

30231.3. Drainage and runoff shall not adversely affect campus wetlands.

- a) The near slopes along the edge of the wetlands shall remain an undisturbed buffer area.
- b) Pollutants shall not be allowed to enter the area through drainage systems.
- c) Runoff into the wetlands will not increase sediment from campus property.

30233(a)1. Fills shall not encroach on Devereux Slough, Storke Campus Wetlands, campus lagoon, or any other natural watercourses or construct channels on campus.

30233(a)2. Fills shall have suitable protection against erosion.

30253.6. New development located less than 50 feet from the bluff top shall be constructed to ensure that all surface and subsurface drainage shall not significantly contribute to bluff erosion or instability.

30253.11. Pedestrian use of unimproved paths up and down the bluff shall be discouraged. To this end, a fence shall be constructed on the coastal bluff top edge, wherever it does not now exist.

30253.12. Surface and sub-surface drainage pipes shall be designed to minimize erosion and instability of the bluff face and only where no other less damaging drainage system is feasible. Drainage devices extending over the bluff face shall not be permitted if the site can feasibly be drained landward of the bluff face.

30253.13. Within 50 feet of the bluff top, vegetation shall be maintained or replanted with drought resistant species should grading be required to establish proper drainage landward of the bluff.

30253.16. Campus development should comply with the Federal Emergency Management Agency (FEMA) requirements for development in an A1-30 flood hazard zone

¹ The Federal Emergency Management Agency has designated flood hazard zones (e.g., from a 100-year storm), which are typically identified on a Flood Insurance Rate Map. The zone code "A" refers to areas in which flooding would occur without wave action, while the code numbers "1-30" represent the potential difference between the water level for a "10" and "100" year flood.

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30254.1. Development of water mains, reclaimed water distribution systems, water treatment facilities, sewage lines, telephone transmission lines, and parking lots and structures will be designed and constructed to meet campus needs.

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4.3.4.3 Thresholds of Significance

The following thresholds of significance are based on Appendix G of the CEQA Guidelines. For purposes of this EIR, implementation of the proposed project may have a significant adverse impact related to hydrology and water quality if it would result in any of the following:

- Violate any water quality standards or waste discharge requirements
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level
- Substantially alter the existing drainage pattern of the site or area that would result in substantial erosion or siltation on or offsite
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or offsite
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects
- Otherwise substantially degrade water quality
- Place housing or other structures within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary, FIRM, or other flood hazard delineation map
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows
- Expose people or structures to a significant risk of loss, injury, or death involving flooding
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow

4.3.4.4 Effects Not Found to Be Significant

The Initial Study prepared for the proposed project did not identify any hydrology and water quality impacts as “effects not found to be significant”; therefore, all potential hydrology and water quality impacts (identified in Appendix G of the CEQA Guidelines) are discussed in this EIR.

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Impact 4.3-1. Implementation of the proposed project would not violate existing water quality standards related to stormwater runoff, nor violate waste discharge requirements related to wastewater discharge. This impact would be *less than significant*.

Amendment of the LRDP to permit residential development on the North Campus, coastal access improvements, and open space management activities, including habitat restoration, would not violate existing water quality standards related to stormwater runoff nor violate waste discharge requirements related to wastewater discharge.

Development of faculty housing on the North Parcel would involve the grading and disturbance of approximately 23 acres of land, followed by construction of 236 units of housing and associated infrastructure, including roads, driveways, and common recreational space. Development of the Sierra Madre Family Student Housing complex on the Storke-Whittier site would involve the grading and disturbance of approximately 10.7 acres of land, plus an additional 2.8 acres of land adjacent to the existing West Campus Family Student Housing, to construct 151 units of housing, plus associated surface parking. Residential development would include bioswales, pervious pavements or other drainage features that would direct runoff into landscaped areas, treatment wetlands, or other structural water quality control features, prior to discharge into tributaries of Devereux Creek.

Implementation of the portion of the Open Space Plan under the University's jurisdiction would result in coastal access improvements, including: 1) improvement of existing trails; 2) improvement of three existing beach access points; 3) installation of a new coastal access stairway; 4) provision of additional public parking at up to four locations; and 5) replacement of an existing portable restroom. In addition, existing degraded habitat would be restored and Open Space Areas would be managed to preserve coastal resources, including installation of a fence and vegetated buffer around the boundary of the COPR. Installation of coastal access improvements and habitat restoration activities could expose soils to erosion during construction.

Construction of residential development and coastal access improvements, exposed soil surfaces could be exposed to erosion from wind and water. Restoration of coastal resources, such as sensitive habitats, could also result in ground disturbance and exposure of soils to erosion. During project operation, urban contaminants from residential development and Open Space Areas open to recreational uses could be discharged into tributaries of Devereux Creek.

To reduce potential impacts to water quality from construction and operation, the proposed project would comply with the requirements of the campus' Storm Water Management Plan (SWMP). Prior to the start of construction of any project component that would result in the disturbance of one acre or greater, a Storm Water Pollution Prevention Plan (SWPPP) shall be prepared that describes the site, erosion and sediment controls, runoff water quality monitoring, means of waste disposal, control of post-construction sediment and erosion control measures

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and maintenance responsibilities, and non-stormwater management controls. Depending on the site characteristics and the extent of disturbance, the elements of the SWPPP may include:

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- a. **Minimize Disturbed Areas:** Only clear land that will be actively under construction in the near term (e.g., within the next six to 12 months), minimize new land disturbance during the rainy season, and avoid clearing and disturbing sensitive areas (e.g., steep slopes and natural watercourses) and other areas where site improvements will not be constructed.
- b. **Stabilize Disturbed Areas:** Provide temporary stabilization of disturbed soils whenever active construction is not occurring on a portion of the site. Provide permanent stabilization during finish grade and landscape the site.
- c. **Protect Slopes and Channels:** Safely convey runoff from the top of the slope and stabilize disturbed slopes as quickly as possible. Avoid disturbing natural channels. Stabilize temporary and permanent channel crossings as quickly as possible and ensure that increases in runoff velocity caused by the proposed project do not erode the channel.
- d. **Control Site Perimeter:** Delineate site perimeter to prevent disturbing areas outside the project limits. Divert upstream runoff safely around or through the construction project. Local codes usually state that such diversions must not cause downstream property damage or be diverted into another watershed. Runoff from the proposed project site should be free of excessive sediment and other constituents. Control tracking at points of ingress to and egress from the proposed project site.
- e. **Retain Sediment:** Retain sediment-laden waters from disturbed, active areas within the site.
- f. **Practice Good Housekeeping:** Perform activities in a manner to keep potential pollutants from coming into contact with stormwater or being transported offsite to eliminate or avoid exposure.
- g. **Contain Materials and Wastes:** Store construction, building, and waste materials in designated areas, protected from rainfall and contact with stormwater runoff. Dispose of all construction waste in designated areas, and keep stormwater from flowing on to or off of these areas. Prevent spills and clean up spilled materials.

The SWMP would be implemented post construction by following University standards regarding design requirements. Such standards include design requirements for pervious pavement, flood control, and other structural or non-structural best management practices in addition to long term Operation and Maintenance.

As noted in Regulatory Framework, the campus is not considered a point-source of water pollution for regulatory purposes and is not subject currently to any Waste Discharge Requirements established by the Central Coast RWQCB. As discussed in Section 4.7 (Hazards and Hazardous Materials), no hazardous wastes are discharged into the sewer or storm drainage system on campus. The Goleta West Sanitary District treatment plan would provide treatment of all wastewater generated by residential development, and would remain responsible for meeting federal and state requirements, including applicable Waste Discharge Requirements

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established by the RWQCB. The Goleta West Sanitary District does not anticipate any treatment capacity problems associated with project implementation, and thus is anticipated to continue to comply with all wastewater treatment requirements of the RWQCB.

With compliance with the campus Storm Water Management Plan, the proposed project would not violate any water quality standards or waste discharge requirements, and this impact would be *less than significant*.

Impact 4.3-2. Implementation of the proposed project would not deplete groundwater supplies substantially or interfere with groundwater recharge. This impact would be *less than significant*.

~~Amendment of the LRDP to permit residential development on the North Campus, coastal access improvements, and open space management activities, including habitat restoration, could increase impervious surfaces and reduce groundwater infiltration and increase demand for potable water, which could affect groundwater resources.~~

~~Development of housing on the 26.5-acre North Parcel and the 15-acre Storke-Whittier Parcel (plus an additional 2.8 acres of land adjacent to the existing West Campus Family Student Housing) could result in an increase in impervious surfaces of approximately 22.1 acres, assuming 50 percent coverage (of the entire parcel) by structures, roads, and parking areas. Provision of up to 84 public parking spaces (at up to four locations) could result in another 0.6 acre of impervious area. Thus, the proposed project could result in an increase in impervious area of approximately 22.5 acres. As the total area of the North and West Campuses is approximately 394 acres, implementation of the proposed project could result in coverage of approximately 6 percent of the project area with impervious surfaces. With an estimated surface area of the Goleta Groundwater Basin of approximately 9,210 acres (California Department of Water Resources, 2003), an increase in impervious surfaces of approximately 22.5 acres would represent approximately 0.2 percent of the groundwater basin area. Although project implementation would decrease groundwater recharge at some locations, residential development would include bioswales and the use of landscaped areas to filter stormwater runoff, which would promote groundwater infiltration. Further, runoff from the residential areas would be discharged into the unlined tributaries of Devereux Creek, which drains into the Devereux Slough. Thus, although the amount of impervious surfaces would increase, much of the runoff from those areas would be discharged via bioswales into unlined creek channels, and would not substantially interfere with the recharge of groundwater. The project area is not designated as a groundwater recharge area, nor serves as a primary source of groundwater recharge in the sub-basin. Thus any reduction in groundwater recharge would not substantially deplete groundwater supplies~~

Although the proposed project would not directly utilize groundwater, it would increase demand for potable water, which could increase demand on local groundwater supplies. As discussed more fully in Section 4.15, the Goleta Water District, which supplies the project area with approximately 15,800 acre feet per year of water, of which approximately 2,000 acre feet (about

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12.6 percent) is from groundwater. As noted in Section 4.15, the project would implement water conservation measures to reduce demand for potable water. Therefore, implementation of the proposed project would not deplete groundwater supplies substantially.

Implementation of the proposed project would not deplete groundwater supplies substantially nor interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level and this impact would be *less than significant*. No mitigation is required.

Impact 4.3-3. Implementation of the proposed project would not substantially alter drainage patterns nor result in substantial erosion or siltation on or off-site. Although the installation of a culvert on Devereux Creek could result in soil erosion during construction, ~~w~~With implementation of the identified mitigation measure, this impact would be reduced to a *less-than-significant* level.

Amendment of the LRDP to permit residential development on the North Campus, coastal access improvements, and open space management activities, including habitat restoration, would result in minor alterations to drainage patterns within areas subject to residential development.

Development of faculty housing would occur on approximately 23 acres of land on the North Parcel, which currently drains via sheetflow to the Ocean Meadows Golf Course, several small wetlands on the site, and Phelps Ditch (also known as El Encanto Creek). Residential development would alter drainage patterns by installation of buildings, parking lots, roads, and related infrastructure. Surface runoff would be conveyed via surface channels and cobbled swales into bioswales that would discharge runoff into a series of (new and existing) wetlands at the southeast corner of the site, prior to discharge into Phelps Ditch. The portion of Phelps Ditch that traverses the eastern portion of the site would be modified to stabilize the banks, increase discharge capacity of the channel, and create an overbank area, so that flooding (including 100-year flood flows) would be contained within the expanded channel and overbank areas. When development is completed, the proposed drainage system within the portion of the North Parcel subject to residential development would generally mimic existing conditions, with runoff conveyed via cobbled channels and bioswales into wetlands that would then discharge to Phelps Ditch.

Development of the Sierra Madre Family Student Housing complex would occur on approximately 10.7 acres of land on the Storke-Whittier Parcel, which currently drains via sheetflow to a wetland at the eastern end of a tributary channel of Devereux Creek (which crosses the Ocean Meadows Golf Course) and an adjacent 2.8 acres of lawn area east of the existing West Campus Family Student Housing complex, which currently drains via sheetflow to Storke Road and drainage channels within the housing complex. Residential development would alter drainage patterns by the installation of buildings, parking lots, roads, and related infrastructure. Drainage from residential development would be conveyed via bioswales and landscaped areas prior to discharge into the eastern tributary channel of Devereux Creek. Runoff

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from the surface parking area (east of the existing Family Student Housing complex) would be conveyed to existing drainage facilities located along Storke Road or within the existing housing complex. The proposed drainage system on the Storke-Whittier Parcel subject to residential development would generally mimic existing conditions, with runoff conveyed via cobbled swales and landscaped areas prior to discharge into the eastern tributary of Devereux Creek.

Implementation of the portion of the Open Space Plan under the University’s jurisdiction would result in coastal access improvements, including: 1) improvement of existing trails; 2) improvement of three existing beach access points; 3) installation of a new coastal access stairway; 4) provision of additional public parking at up to four locations; and 5) replacement of an existing portable restroom. In addition, existing degraded habitat would be restored and Open Space Areas would be managed to preserve coastal resources, including installation of a fence and vegetated buffer around the boundary of the COPR. Installation of coastal access improvements and habitat restoration activities could expose soils to erosion during construction and restoration. Improvement of approximately 8.18 miles of existing trails would result in some minor grading of approximately 6.2 acres of ground surface to improve and widen trails. Development of public parking at up to four locations and replacement of the restroom at Coal Oil Point would result in grading of a total of approximately 0.6 acre. As trail improvement would only occur at locations currently occupied by trails, the installation of trail surfaces (e.g., decomposed granite with a chemical binder) could result in minor alterations of drainage patterns, due to the reduced permeability and increased width of trail surfaces. Trail improvements would be designed consistent with the goals and objectives of the Open Space Plan, which recognize the need to minimize effects on sensitive resources and control erosion. Restoration of habitat and other open space management activities are anticipated to occur in small discontinuous areas, which any modification of drainage patterns would be localized (e.g., vernal pools) and would not substantially alter drainage patterns across Open Space Areas.

A ~~60 x 42-inch~~ 42-foot-wide by 5-foot-high ~~box~~ culvert would be installed on Devereux Creek (under the Venoco Access Road) to replace two existing 24-inch corrugated metal pipes. Currently, Devereux Creek discharges into Devereux Slough via the twin discharge pipes. When flow exceeds the capacity of the drainage pipes, water impounds within the creek channel upstream (within the Ocean Meadows Golf Course). During large storm events, the impounded water exceeds the elevation of an “Arizona crossing” (a concrete depression in the road surface designed to contain overflows and still permit vehicular access) and water spills over the road into the Devereux Slough. Replacement of the pipes with the culvert would not alter the existing drainage pattern of the creek; however, the amount of constraint on the discharge capacity of the creek that the existing pipes provide would be reduced. Following installation of the culvert, during low flows (e.g., non storm conditions), discharge would essentially be the same as current conditions. At intermediate flows, discharge would no longer be constricted (as is the case currently due to the twin discharge pipes). During large storm events (e.g., discharges that currently breach the Arizona crossing), discharge would occur via the culvert, instead of overflow via the Arizona crossing. The replacement of the corrugated pipes with a culvert could reduce sediment deposition within Devereux Creek and increase sediment discharge into the Devereux Slough.

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Because of current restricted discharge capacity, when water impounds upstream, sediment present in stormwater runoff may be deposited within an upstream debris basin and the creek channel, reducing the flood discharge capacity of the creek (contributing to upstream flooding problems). However, to increase flood discharge capacity of the creek, in 2002, the County of Santa Barbara removed sediment from the creek channel within the southern portion of the Ocean Meadows Golf Course.

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Such removal of sediment reduces the potential for erosion of in-channel sediments as a result of culvert installation. In addition, the proposed restoration of the South Parcel (including revegetation of areas of bare soil and installation of sedimentation basins), combined with residential development on the North Parcel and Storke-Whittier Parcel (which would implement erosion control measures during construction and include vegetated swales and other measures to reduce runoff) would reduce potential soil erosion on the North Campus ~~would be reduced~~, along with future sediment loads in Devereux Creek. To reduce potential soil erosion during construction of the culvert, MM 4.3.3(a) to require installation during the dry season, MM 4.3.3(b) to stabilize exposed soil surfaces, and MM 4.3.3(c) to stabilize adjacent portions of the channel would be implemented.

MM 4.3-3(a). Installation of a culvert on Devereux Creek under the Venoco Access Road shall be restricted to the period from May to October, when rainfall is typically limited.

MM 4.3-3(b). Installation of the culvert shall be accompanied by the removal of sediment in the existing upstream debris basin.

MM 4.3-3(c). Installation of the culvert shall be accompanied by measures to stabilize the portions of the channel immediately upstream and downstream of the culvert, and to re-vegetate areas affected by construction activities.

Implementation of the proposed project would not substantially alter the existing drainage pattern of the site or area, the installation of a culvert on Devereux Creek ~~is not~~ could result in substantial erosion of sediments within Devereux Creek and siltation within the Devereux Creek in the short term. With implementation of MM 4.3-3(a), MM 4.3-3(c), and MM 4.3-3(c), this impact would reduced to a *less-than-significant* level.

Impact 4.3-4. Implementation of the proposed project would not substantially alter site drainage patterns or substantially increase the rate or amount of surface runoff, and would not result in flooding either on or offsite. This impact would be *less than significant*.

Amendment of the LRDP to permit residential development on the North Campus, coastal access improvements, and open space management activities, including habitat restoration, would result in minor alterations to drainage patterns, but would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or offsite.

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Section 4.3 As discussed under Impact 4.3-3, above, the proposed project would result in minor alteration of drainage patterns in those areas subject to residential development and installation of public parking lots. Implementation of other coastal access improvements, restoration of habitat and management of other coastal resources would result in only minor localized changes in drainage patterns.

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Development of housing on the 26.5-acre North Parcel and the 15 acre Storke-Whittier Parcel (plus an additional 2.8 acres of land adjacent to the existing West Campus Family Student Housing) could result in an increase in impervious surfaces of approximately 21.9 acres, based on an assumed 50 percent coverage of structures, roads, and parking areas. Provision of up to 84 public parking spaces (at up to four locations) could result in another 0.6 acre of impervious area. Thus, the proposed project could result in an increase in impervious area of approximately 22.5 acres. As the total area of the North and West Campuses is approximately 394 acres, implementation of the proposed project could result in coverage of approximately 6 percent of the project area with impervious surfaces. Although residential development would result in an increase in runoff, as the majority of the North and West Campuses would remain undeveloped, the increase in runoff from developed areas would not be substantial in comparison to existing conditions. Further, the use of bioswales to pervious areas to filter runoff would encourage infiltration of runoff from residential development.

Implementation of the proposed project would not alter site drainage patterns substantially or increase the rate or amount of surface runoff substantially, and would not cause flooding either on or offsite, and this impact would be *less than significant*. No mitigation is required.

Impact 4.3-5. Implementation of the proposed project would not create runoff that could exceed the capacity of existing storm drain systems or provide substantial sources of polluted runoff. This impact would be *less than significant*.

Amendment of the LRDP to permit residential development on the North Campus, coastal access improvements, and open space management activities, including habitat restoration, would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

As discussed under Impact 4.3-3 above, the proposed project would result in minor alteration of drainage patterns in those areas subject to residential development and installation of public parking lots. Implementation of other coastal access improvements, restoration of habitat, and management of other coastal resources would result in only minor localized changes in drainage patterns.

As discussed under Impact 4.3-4 above, the proposed project would result in an increase in impervious areas of approximately 6 percent of the North and West Campuses, and this increase would not result in substantial increases in surface runoff. With the proposed modifications to Phelps Ditch (discussed above under Impact 4.3-3) to improve flood discharge capacity, and

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installation of a culvert on Devereux Creek under the Venoco Access Road (discussed above under Impact 4.3-4), the increase in runoff associated with residential development and development of coastal access parking lots, the proposed project would not result in runoff volumes that would exceed the capacity of existing or planned stormwater drainage systems.

Development of new housing and coastal access parking lots would result in an increase of impermeable surface areas, which could result in additional stormwater runoff that may contain stormwater contaminants that are typical of urbanized areas. Common stormwater pollutants include oil and grease and metals from roadways and parking lots, pesticides, fertilizers and animal waste from landscaped areas, and trash. The University would implement applicable provisions of the Storm Water Management Program, described above under Impact 4.3-1, to reduce potential stormwater contaminants from construction and operation of the proposed project.

With implementation of the proposed drainage improvements, compliance with the applicable provisions of the University's Storm Water Management Plan, the proposed project would not alter site drainage patterns substantially or increase the rate or amount of surface runoff substantially, and would not exceed the capacity of existing storm drain systems or provide substantial sources of polluted runoff, and this impact would be ~~reduced to a less-than-significant level.~~

Impact 4.3-6. Implementation of the proposed project would not include the construction of new stormwater drainage systems, but would include the expansion of existing stormwater drainage systems, the construction of which could result in significant impacts. With implementation of the identified mitigation measures, this impact would be reduced to a *less-than-significant* level.

Amendment of the LRDP to permit residential development on the North Campus would result in expansion of existing drainage facilities, the construction of which could result in significant impacts.

As discussed above under Impact 4.3-3, development of faculty housing on the North Parcel would include improvements to that portion of Phelps Ditch that traverses the eastern portion of the site to stabilize the banks, increase discharge capacity of the channel, and create an overbank area, so that flooding (including 100-year flood flows) would be contained within the expanded channel and overbank areas. In addition, the proposed project includes installation of a culvert on Devereux Creek, under the Venoco Access Road (discussed above under Impact 4.3-3). No other modifications to drainage facilities are proposed, with the exception of minor extension of existing drainage culverts or surface channels, which would accommodate runoff from some locations of project development, such as the surface parking to be developed in the lawn area east of the existing West Campus Family Student Housing.

Modifications to Phelps Ditch would result in the short-term removal of existing riparian vegetation within the channel, a potentially significant temporary impact discussed more fully

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under Impact 4.4-2 (in Section 4.4, Biological Resources). As part of such modifications, the riparian habitat of Phelps will be restored and enhanced. In addition, expansion of Phelps Ditch, installation of a culvert under the Venoco Access Road, or other minor extensions of existing storm drain facilities would contribute to potentially significant impacts related to construction noise.

Mitigation Measures to reduce the adverse impacts to riparian vegetation resulting from drainage modifications are identified in Section 4.4 (Biological Resources) and include MM 4.4-2(j) (Wetlands and Environmentally Sensitive Habitat Restoration Plan) and MM 4.4-2(i) (Construction Management). With implementation of these mitigation measures, impacts to biological resources would be reduced to a less-than-significant level. Implementation of MM 4.13-2, to limit hours of construction, MM 4.13-6(a), to require that stationary construction equipment be located away from residential areas, and MM 4.13-6(b), require signage with contact information for construction noise complaints, would reduce potential construction effects associated with expansion of storm drain facilities. Given the location of these facilities, the limited extent of improvement and the proposed mitigation measures, noise impacts associated with storm drain facility improvements would be reduced to a less-than-significant level.

With implementation of the identified mitigation measures, implementation of the proposed project would expand existing drainage facilities, however the construction of which would not cause significant environmental effects, and this impact would be reduced to a *less-than-significant* level.

Impact 4.3-7. Implementation of the proposed project would not otherwise degrade water quality substantially. This impact would be *less than significant*.

Amendment of the LRDP to permit residential development on the North Campus, coastal access improvements, and open space management activities, including habitat restoration, would not otherwise substantially degrade water quality.

As discussed under Impacts 4.3-1, 4.3-3, 4.3-4, and 4.3-5, residential development, coastal access improvements, and habitat restoration and management of open space could expose soil surfaces during construction and ground disturbance activities, and result in operational increases in runoff volumes that would contain urban contaminants. For development on areas greater than one acre, an SWPPP would be prepared to minimize erosion during construction. In addition, the University would implement other applicable provisions of the campus' SWMP, including construction and operational BMPs to reduce potential water quality impacts.

With compliance with provisions of an SWPPP during construction and provisions of the SWMP, implementation of the proposed project would not otherwise substantially degrade water quality, and this impact would be *less than significant*.

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Impact 4.3-8. Implementation of the proposed project would not place housing within a 100-year flood hazard area. This impact would be *less-than-significant*.

Amendment of the LRDP to permit residential development on the North Parcel and the Storke-Whittier Parcel would place some housing within the 100-year flood hazard area as currently delineated on a federal Flood Hazard Boundary, FIRM, or other flood hazard delineation map. However, proposed drainage improvements would reduce the flood hazard elevation, and thus the project would not place housing within a flood hazard area.

As discussed above under Impact 4.3-3, development of faculty housing on the North Parcel would include improvements to that portion of Phelps Ditch that traverses the eastern portion of the site. This would stabilize the banks and increase discharge capacity so that flooding (including 100-year flood flows) would be contained within the expanded banks and an overbank area. As a result of this improvement, the 100-year flood hazard area would be reduced to within the expanded creek channel and the adjacent overbank areas (which would provide additional flood protection). Thus, the residential development on the North Parcel, as currently proposed, would reduce the area subject to inundation during a 100-year flood event, and none of the faculty homes would be developed within the flood hazard area.

Installation of a culvert on Devereux Creek under the Venoco Access Road would reduce the 100-year flood hazard elevation level by approximately 0.42 feet (Penfield and Smith, 2004). With this reduction in flood elevation, none of the Family Student Housing on the Storke-Whittier Parcel would be located within a flood hazard area. In addition, as part of the project description, building pads on the Storke-Whittier would be elevated as necessary above the 100-year flood hazard level, which would be reduced as noted above.

With implementation of the modifications to Phelps Ditch and the installation of a culvert on Devereux Creek, the proposed project would not place housing within a 100-year flood hazard area, and this impact would be *less than significant*.

Impact 4.3-9. Implementation of the proposed project would place structures within a 100-year flood hazard area, but would not impede or redirect flood flows. With the inclusion of the identified Mitigation Measure, this impact would be reduced to a *less-than-significant* level.

Amendment of the LRDP to permit residential development would include modifications to Phelps Ditch and installation of a culvert on Devereux Creek, as discussed above under Impact 4.3-8. Installation of a culvert on Devereux Creek would modify the existing drainage facilities on the creek, but this improvement is intended to increase discharge capacity, and thus would not impede or redirect flood flows. Development of faculty housing on the North Parcel would also include construction of a bridge over Phelps Ditch to improve pedestrian and bicycle access to portions of the site. The construction of the bridge over Phelps Ditch could introduce structural bridge supports within the 100-year flood hazard zone that could impede or redirect flood flows, a potentially significant impact.

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Section 4.3 MM 4.3-9 would reduce potential effects from placement of structures within a 100-year flood
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MM 4.3-9. For the bridge over Phelps Ditch, structural supports shall either be placed outside the 100-year flood hazard zone, or be designed such that flood flows would be directed toward the overbank area (adjacent to the ditch), which would contain potential flood flows associated with bridge supports.

With implementation of the MM 4.3-9, the proposed project would not place structures that would impede or redirect flood flows within a 100-year flood hazard area, and this impact would be reduced to a *less-than-significant* level.

Impact 4.3-10. Implementation of the proposed project would not expose people or structures to significant risk of loss, injury, or death involving flooding. With implementation of the identified mitigation measures, this impact would be reduced to a less-than-significant level.

Amendment of the LRDP to permit residential development and open space improvements would only result in minor alterations to site drainage patterns, as discussed above in Impact 4.3-4. Modification to Phelps Ditch (including creation of an overbank area) and installation of a culvert on Devereux Creek would reduce the extent of the 100-year flood hazard area, such that no residential structures would be located within the hazard area. MM 4.3-9, discussed above under Impact 4.3-9 would reduce potential effects from placement of bridge support structures within a 100-year flood hazard area that could impede or redirect flood flows.

With implementation of the proposed drainage improvements and MM 4.3-9, the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving flooding, and this impact would be reduced to a *less-than-significant* level.

Impact 4.3-11. Implementation of the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow. This impact would be *less than significant*.

Amendment of the LRDP to permit residential development on the North Campus, coastal access improvements, and open space management activities, including habitat restoration, would not expose people or structures to seiche, tsunami, or mudflow risks because the project would be developed on land away from water bodies subject to seiche, above the run-up range of tsunami, and away from slopes subject to mudflows.

A seiche is an oscillation of a body of water in an enclosed or semi-enclosed basin, such as a reservoir, harbor, lake, or storage tank. There are three enclosed surface water bodies in or near the project site: Goleta Slough, the Campus Lagoon, and Devereux Slough. The sloughs, lagoon, and other small ponds and vernal pools in and around the campus do not pose a threat to people or structures in the event of a seiche because they are shallow bodies of water, and are generally surrounded by undeveloped areas.

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A tsunami is a great oceanic wave, commonly referred to incorrectly as a tidal wave, produced by a significant undersea disturbance such as tectonic displacement of the sea floor associated with large, shallow earthquakes. Because the University campus is along the Pacific Ocean coast,

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there is the potential for tsunami to affect the site. Tsunami inundation elevations in the Santa Barbara area are approximately 5.5 feet for a 100-year event and approximately 11 feet for a 500-year event (Houston and Garcia, 1974). Most of the project site is above the elevation of the 100-year tsunami run-up event. The FEMA Floodway map for the site area (1985) shows only the shoreline as a tsunami flood hazard area.

The potential for mudflows to affect campus development is limited to areas immediately adjacent to the coastal bluffs around the campus. Development of coastal access stairways could occur at locations that are subject to slope failure, which could include mudflows if underlying soils were saturation. Implementation of MM 4.2-1(b) (discussed more fully in Impact 4.2-1, in Section 4.2, Geology and Soils) would require site-specific geotechnical analysis and incorporation of relevant recommendations into design, would mitigate any potential impacts associated with development along the coastal bluffs.

With implementation of the Mitigation Measures identified above, implementation of the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow, and this impact would be *less than significant*.

4.3.5 Cumulative Impacts

The geographic context for the analysis of hydrology and water quality impacts is the South Coast Hydrologic Unit, which generally includes that area west of the Santa Ynez Mountains, from Carpinteria to Arguello, and includes the Devereux Creek Watershed. With respect to groundwater, the geographic context includes the Santa Barbara Groundwater Basin, which is bounded on the north by the Mission Ridge fault, on the east by an administrative boundary between the Santa Barbara and Montecito basins, on the southeast by the Pacific Ocean, on the southwest by the Lavigia Fault, and on the west by an unnamed fault. The analysis accounts for all anticipated cumulative growth represented by full implementation of the County of Santa Barbara General Plan, the City of Santa Barbara General Plan, the City of Goleta General Plan, the UCSB Long Range Development Plan, and all approved or potential projects identified in Table 4.1-1.

Cumulative urban development would involve soil-disturbing construction activities, such as vegetation removal, grading, and excavation. These soil disturbances would expose soil to wind- and water-generated erosion, possibly at accelerated rates. Therefore, surface runoff would carry increased sediment loads. As previously described, sediment from erosion can have long- and short-term water quality effects, including increased turbidity, which could result in adverse impacts to beneficial uses such as fish and wildlife habitat, impaired recreation and aesthetic values, and increased flooding hazard due to reduced channel capacity.

Urban development also results in increased impervious surfaces that increase the rate and amount of runoff and can alter existing surface water quality. The primary sources of water pollution includes runoff from roadways and parking lots, runoff from landscaping areas,

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Section 4.3 Hydrology and Water Quality industrial activities (including wastewater treatment plants), non-stormwater connections to the drainage system, accidental spills, and illegal dumping. Runoff from roadway and parking lots could contain high levels of oil, grease, and heavy metals. Runoff from landscaped areas could contain high concentrations of nutrients (i.e., fertilizers and pesticides).

The Central Coast Regional Water Quality Control Board controls water quality by implementing the Basin Plan, which includes issuing and enforcing waste discharge requirements to individuals, communities, or businesses whose waste discharges can affect water quality, and enforcing both water quality standards and water quality objectives. Waste Discharge Requirements are issued by the Regional Water Quality Control Boards when a Report of Waste Discharge is filed for activities that involve direct or diffused discharges to land or groundwater. (For specified situations, some permits may be waived and some discharge activities can be handled through enrollment in an existing general permit.)

Section 303 of the 1972 Amendments to the federal Water Pollution Control Act requires the State to submit to the Administrator of the U.S. Environmental Protection Agency (U.S. EPA) for approval, all new or revised water quality standards which are established for surface and ocean waters. Under federal terminology, water quality standards consist of beneficial uses and water quality objectives (or water quality criteria) that must be achieved to achieve those beneficial uses. Water quality standards become legally enforceable criteria when accepted by the U.S. EPA Regional Administrator. Water quality objectives have been adopted by the State and, when applicable, extended as federal water quality standards. Water quality objectives for the Central Coastal Basin satisfy State and federal requirements to protect waters for the beneficial uses identified in the Basin Plan and are consistent with all existing statewide plans and policies.

Because each new (or proposed) development must ensure compliance with the water quality standards and water quality objectives identified in the Basin Plan on a project-by-project basis through compliance with all applicable laws and regulations, including NPDES Phases I and II and any local requirements, and file a Report of Waste Discharge to have Waste Discharge Requirements issued for certain classes of activities, it is assumed that cumulative impacts associated with a violation of water quality standards or waste discharge requirements would be avoided and, therefore, cumulative impacts would be less than significant. Further, the project's contribution to this impact would not be cumulatively considerable, as the project-specific environmental analysis indicates that the project would not violate these standards or requirements with the implementation of all identified mitigation measures and/or LRDP policies, and a less-than-significant impact would result.

Nonetheless, according to water quality reports that studied water quality from 1999 through 2003 throughout the County of Santa Barbara (Project Clean Water), water quality is generally impaired within the county as the result of high levels of bacteria, herbicides and pesticides, and dissolved metals, although other indications of water quality impairment may exist. In addition, the Central Coast Basin Plan indicates that “[A]dequate quality water for many beneficial uses in the Central Coastal Basin is in short supply. Water rationing for domestic purposes is seriously considered and sometimes implemented during water shortages. The use of water by the human

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population and its activities is increasing in the basin. Water mining and seawater intrusion have resulted in some locations. Consequently, the competition for waters of adequate quality will become more intense in the future.” This characterization of the water quality of the county is an existing condition.

According to Heal the Bay’s 13th Annual Beach Report Card (May 2003),¹ dry weather water quality at most beaches in Santa Barbara County was good. Of the 20 water quality monitoring locations, 17 locations received good-to-excellent water quality marks. However, wet weather water quality in Santa Barbara County on the whole continues to be poor. Although 55% of the beaches received an F this year, this was a slight improvement compared to the previous three years: —60% in 2002, 100% in 2001, and 79% in 2000. While the Annual Beach Report Card indicated that the general water quality trend for both dry and wet weather was improved compared to previous years, water quality problems still exist within the county. Therefore, with respect to cumulative water quality impacts at Sands Beach during wet weather conditions when the Slough is open to the ocean, any potential contribution to an existing degraded condition ~~would be~~ is considered significant and unavoidable. While not anticipated, and perhaps avoided with adherence to the provisions of the University’s ~~Storm Water Management Plan SWMP~~, ~~the proposed project would incrementally contribute to potential water quality impairment, particularly because increased public use of the Open Space Plan area could result in adverse impacts to water quality, such as through introduction of increased~~ domestic animal wastes and associated increases in nutrient loading and/or bacterial pathogens. Therefore, the project and related development in the project vicinity would contribute ~~in to~~ a significant and unavoidable cumulative water quality impact at Sands Beach during wet weather conditions when the Slough is open to the ocean.

Groundwater is produced from three groundwater basins within the Santa Barbara Groundwater Basin: Storage Unit 1 (in the vicinity of downtown), the Foothill Basin (upper State Street area), and Storage Unit 3 (located generally in the Westside area). Groundwater is pumped to replace surface supplies lost to drought. During periods of ample surface supplies, groundwater is allowed to recharge naturally and by means of artificial recharge. Hydrographs show that groundwater levels have been steadily increasing or have remained stable between 1990 and 1997. Shallow wells have exhibited slight declines through the moderate winters of 1998 through 2000, whereas some deep wells have continued to show increases in water levels and are currently at historic highs. Groundwater exists at levels sufficient to provide part of the City’s and County’s required water supply source.

¹ The Annual Beach Report Card is assembled using data collected by the County of Santa Barbara, Environmental Health Agency, in support of its Ocean Monitoring Program. As part of the program, Environmental Health Services are currently building a computer database of the test results to help understand trends and possible causes; however, to date, Heal the Bay’s Annual Beach Report Card represents the best analysis and interpretation of the County’s data.

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While additional development would occur within the Santa Barbara area, which would reduce the amount of pervious surfaces subject to natural recharge, the majority of the recharge is the result of controlled releases of surplus surface water and injections capabilities at two production wells. Therefore, as sufficient groundwater is currently available for municipal, agricultural, and industrial uses, and any projected development would not substantially interfere with recharge capabilities, a less-than-significant cumulative impact would occur. In addition, the project's contribution would not be cumulatively considerable, as it would represent a 0.0003 percent increase in impervious surfaces within the groundwater basin. Further, the project site is not a designated recharge area; nor would it directly draw any groundwater from the basin, therefore, a less-than-significant cumulative impact would occur.

The Devereux Creek is composed of urban uses and agricultural uses, with few remaining open spaces that proposed to be developed (per the list of related projects). As a result, most of the drainage system in the watershed consists of engineered storm channels and, therefore, is expected to experience little change. Additionally, as extensive development is not expected in the remaining open spaces, it is unlikely that there will be substantial alteration of drainage systems and watercourses in those areas. This indicates that the amount of runoff will not substantially increase, thereby avoiding substantial increases in erosion, siltation, flooding. New development would also be required to comply with NPDES Phases I and II, and adopt BMPs to reduce the occurrence of erosion and siltation. As a consequence, it is not expected that there will be a cumulatively significant impact. The proposed project's impact is also not cumulatively considerable, and would be less than significant, because the all necessary erosion control measures required by NPDES Phases I and II, LRDP policies, and SCAQMD Rule 403 would be implemented. This is considered to be a less-than-significant impact.

Significant flooding currently occurs throughout the County. In fact, according to County Ordinance Number 3898, "The flood hazard areas of Santa Barbara County are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare. These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards that increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately flood-proofed, elevated, or otherwise protect from flood damage also contribute to the flood loss." Therefore, a ~~significant~~ cumulative impact could occur.

However, the County of Santa Barbara Flood Control District has an extensive flood control program to limit or avoid flooding events that affect people or property as the result of individual development projects. All new development must conduct detailed hydrologic studies, and improvements are required to intercept and convey off-site and on-site runoff to a District-approved water course or drainage facility. Storm drains and drainage inlets are sized for a peak 25-year runoff event with a positive overland escape design for a 100-year storm. While localized drainage patterns may change, local regulations prohibit an increase in the rate or amount of surface runoff as the result of new development that would directly result in flooding on or

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offsite. With the proposed modifications to Phelps Ditch and the installation of a culvert on Devereux Creek, the project's contribution would not be cumulatively considerable, and this impact would be less-than-significant.

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As development occurs throughout the Santa Barbara region, the construction of new stormwater drainage systems could cause significant environmental effects, depending upon the location, the construction methods, the time of year, and the extent of impacts. Therefore, on a cumulative basis, this impact is considered potentially significant. However, the project's contribution would not be cumulatively considerable given the relatively minor areas that would be disturbed in conjunction with modifications of Phelps Ditch and the installation of a culvert on Devereux Creek. In addition, Mitigation Measures 4.3-3(b) and 4.3-3(c) requires removal of sediment from an upstream debris basin on Devereux Creek and revegetation of portions of the Devereux Creek channel affected by construction. A less-than-significant impact would occur.

Housing could be placed within the 100-year floodplain in the Santa Barbara area. However, if, or when, that occurs, the Federal Emergency Management Agency (FEMA) requires that the first floor elevation of residential structures be at least one foot above the estimated 100-year flood elevation to avoid significant risk of loss, injury, or death. Therefore, the cumulative impact would be less than significant. Similarly, the project's contribution would not be cumulatively considerable because the project includes modifications to Phelps Ditch and installation of a culvert on Devereux Creek that would both facilitate compliance with all applicable FEMA regulations. A less-than-significant impact would occur.

In addition to housing, other structures could be placed within the 100-year floodplain in the Santa Barbara area, which could impede or redirect flood flows. While there is no specific federal requirement as to the placement of those structures relative to flood elevations, the County's Flood Plain Management Program reviews proposed subdivisions and single building permit applications within unincorporated areas of the County for conformance with applicable Flood Plain Management Ordinances, which address setbacks from major watercourses, adequacy of drainage plans, and protection of existing development. As a constitutionally created entity of the State of California, the campus is not subject to municipal regulations, such as the Flood Plain Management Program or the Flood Plain Management Ordinances. However, while these regulations and ordinances would not apply to the campus itself, it would prevent future regional flood hazards from being created in developing areas and would eliminate the need for constructing future expensive flood control facilities. Further, the floodplain maps developed by FEMA for Santa Barbara County and the seven cities are the foundational planning tool in regulating development in floodplain areas. Therefore, the cumulative impact would be less than significant. Similarly, the project's contribution would not be cumulatively considerable with implementation of MM 4.3-9, which requires flood control devices to ensure that the placement of structures within a 100-year flood hazard area would not impede or redirect flood flows. Therefore, a less-than-significant impact would occur.

The relative threat for tsunamis or seiches in California is considered relatively low because of the low recurrence frequencies, which are estimated to occur only once every 100 years, coincident with major earthquakes on land or offshore. The major waterbodies within Santa Barbara County that could experience a seiche include Lake Cachuma and the harbor. Throughout the County, there is a risk of mudflows, due to the steep topography of adjacent hillsides and the amount of precipitation that could occur in the winter season.

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Section 4.3 Tsunamis, seiches, and mudflows are isolated events that are not caused by or influenced by cumulative development; however, cumulative development can be affected by these events. **Hydrology and Water Quality** Because of the relative infrequency of tsunamis, seiches, and mudflows, and because the only way to avoid injury or damage to people or property is to prohibit development, which would mean the prohibition of development within many miles of the coast for tsunamis; within approximately five miles of major waterbodies for seiches; and within several miles of canyons or the base of hillsides for mudslides. This type of prohibition of development is not feasible, not reasonable, given existing zoning, general plan designations, and development trends, as well as the expected infrequency of these events. Therefore, the cumulative impact is considered less than significant. For a similar reasoning, the project's contribution would not be cumulatively considerable, and a less-than-significant impact would result. (Worth noting, there has been no reported incident of a seiche within Santa Barbara County, and the last report tsunami occurred in 1812.)

4.3.6 References

The following is a list of references for this subsection.

Bennet, J. 1972. Natural History Resources Survey for West Campus, 1971-1972. University of California, Santa Barbara. Office of Architects and Engineers.

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