Appendix F
Memorandum of Water Resources and Hydrology Sections of LAC+USC Medical Center EIR and Memorandum of Hydrology Modeling Results

MEMORANDUM OF WATER RESOURCES AND HYDROLOGY SECTIONS OF LAC+USC MEDICAL CENTER EIR

Project: **LAC+USC Medical Center EIR**
Client: ICF International/Los Angeles County
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Date: 7/24/2014
Purpose: Memorandum of Water Resources and Hydrology Sections of EIR

Note: Draft memorandum released under the authority of Jennifer J. Walker, P.E. (C77079), D.WRE, CFM on 7/24/2014 and should not be used for design or construction.

This memorandum documents water resources and hydrology portions related to ultimate build-out of the LAC+USC Medical Center project as described in the October, 2013 *LAC+USC Master Plan*.

HYDROLOGY AND WATER QUALITY

This section of the Environmental Impact Report (EIR) addresses existing conditions, proposed conditions, impacts, and cumulative impacts of the LAC+USC Medical Center project related to hydrology and water quality. The impacts are related to ultimate build-out of the planned facilities from the October, 2013 *LAC+USC Master Plan* (*Master Plan*) and cumulative impacts addresses the adjacent University of Southern California (USC) Health Sciences Center (HSC) project based on the Addendum to the EIR for that project included in Appendix A. Appendix B includes a separate hydrology memorandum prepared by Watearth, Inc. for the project. Because a detailed plan has not been developed, impacts and hydrologic analyses are based on the general concept and layout described in the Master Plan rather than a detailed, fixed plan.

SETTING/EXISTING CONDITIONS

Existing conditions at the LAC+USC Medical Center Campus (project site) are described based on evaluation of prior reports, available data, and results of the site reconnaissance. As shown on Exhibit 1, the project site is located just north of Interstate Highway (IH) 10 and just east of IH-5. The site is bounded by Cornwell to the east, Zonal to the north, Marengo to the south, and North Mission to the west. Three additional tracts are located at northeast, northwest, and southwest corners of the intersection of Zonal and North Mission. Existing conditions are discussed in the sections below for the following categories:

- Surface Water Quality
- Groundwater
- Hydrology
- Hydraulics
- Flooding and Hazards

Surface Water Quality

The project site is currently fully developed and land cover consists primarily of buildings and pavement with an existing impervious cover of 95% (Exhibit 2). While limited, vegetation on the site includes trees, shrubs, and turf grass scattered within the project site and dense plantings of trees and groundcovers within the northeastern portion of the site ("the hill"). Photos are included in Appendix C. Land use at the site includes a mix of commercial, transportation, institutional, and landscape.

As is typical with the period of construction, the existing site does not appear to include water quality or stormwater controls, such as stormwater Best Management Practices (BMPs), Low Impact Development (LID) features, or hydromodification management facilities. Additionally, stormwater detention and other flood control features were not observed on-site. Instead, the existing site manages rainfall and stormwater runoff with vertical roof drains, catch basins and drain inlets, underground reinforced concrete pipe (RCP), curbs, gutters, overland sheet flow, driveways, and other means of conveyance into the on-site and off-site storm drain system.

Typical Pollutants from Project Site

Stormwater runoff from the existing site is typical of urbanized areas and includes pollutants from motor vehicles and transportation land uses (parking and driving), such as sediment, hydrocarbons, oil, grease, and heavy metals. Additionally, nutrients from fertilizers as well as herbicides and pesticides associated with landscape maintenance are also likely to be present in stormwater runoff from the existing site.

While vegetative cover of soil is established throughout the site, there is potential for erosion and sedimentation within the northeastern portion of the site ("the hill") due to the steep slopes and presence of unvegetated land. Additionally, concrete-lined conveyance swales along the upper perimeter of "the hill" concentrate and direct runoff perpendicular to the natural slope of the land with the potential for increased runoff rates, and associated erosion at the outlet. Due to the steep slope, there is also potential to convey organic debris from leaves and vegetation, sediment, and other pollutants bound to the sediment, such as heavy metals,

Due to the high volume of visitors to the LA+USC Medical Center, pedestrians, and adjacent bus stops, trash is also expected to be a potential pollutant. As shown in the photos included in Appendix C, many of the drainage inlets in roadways adjacent to the site include screens or grates to prevent or limit trash from entering the storm drain system and discharging to the receiving water (Los Angeles River). Fecal coliform bacteria and other pollutants are also typically found in stormwater runoff from land uses similar to those at the site.

Table 1 summarizes typical pollutants of concern based on land use. The majority of the pollutants are from the February, 2014 County of Los Angeles Department of Public Works *Low Impact Development Standards Manual*. Also included in this table are other pollutants that the U.S. EPA recognizes to be typically associated with land use present on the project site.

TABLE 1: POLLUTANTS OF CONCERN BY LAND USE

Land Use	Pollutants of Concern													
	Suspended Solids[2]	Total Phosphorus[2]	Total Nitrogen[2]	Total Kjedahl Nitrogen[2]	Cadmium, Total[2]	Chromium, Total[2]	Copper Total[2]	Lead Total[2]	Zinc, Total[2]	Biological Oxygen Demand (BOD)[5]	Chemical Oxygen Demand (COD)[5]	Fecal Coliform[5]	Hydrocarbons[5]	Trash[5]
Commercial	X	X	X	X	[4]	[4]	X	X	X					
Industrial	X	X	X	X	[4]	[4]	X	X	X					
Transportation (streets, roads)	X	X	X	X	[4]	[4]	X	X	X					
Institutional (educational facilities)	X				[4]	[4]	X		X					
Project Site	X	X	X	X	X	X	X	X	X	X	X	X	X	X

[1] Adapted from Table A-3 of the *Technical manual for Stormwater Best Management Practices in the County of Los Angeles* (February 2004) and the Southern California Coastal Water Research Project Land Use Specific Storm Water Monitoring Data. X= exceedance of "standard" by observed median/average concentration; blank = no exceedance of "standard" by observed median/average concentration.
[2] Derived from Table 11 of the 2012 Los Angeles County MS4 Permit (page 104).
[3] Critical facilities include automobile dismantling (SIC 50xx), automobile repair (SIC 75xx), metal fabrication (SIC 34xx), motor freight (SIC 42xx), automobile dealerships (SIC 55xx), chemical manufacturing (SIC 28xx), and machinery manufacturing (SIC 35xx).
[4] No available date to determine if these pollutants of concern originate from this land use. Pollutant is assumed to be produced by this land use unless otherwise proven by the project applicant.
[5] Based on 2006 U.S. EPA *Guide to Stormwater Pollutant Concentrations*.

Pollutants of Concern Based on Receiving Water Impairment

The Clean Water Act (CWA) requires that states adopt water quality standards for receiving waters. Water quality standards designate beneficial uses for the receiving water and include criteria required to support those beneficial uses. Water quality criteria are either narrative statements related to the quality of water to support a particular use or maximum concentrations of levels of pollutants (i.e., bacteria, etc.). As part of the CWA, when monitoring data indicates that a pollutant is exceeded, the receiving water is classified as impaired and placed on the *CWA Section 303(d) List of Water Quality Limited Segments Requiring TMDLs* (303(d) List). A Total Maximum Daily Load (TMDL) is then developed for the pollutant(s) causing the impairment.

The purpose of the TMDL is to limit the amount of pollutant(s) discharged to the receiving water from all sources (i.e., stormwater runoff, wastewater, agriculture).

There are several pollutants of concern related to the receiving body of water and include those pollutants with a developed TMDL requirement, other pollutants listed on the 303(d) List, and pollutants of concern for the Los Angeles River watershed management area. The project site is located between Carson and Figueroa Street within Reach 2 of the Los Angeles River. Data from the State Water Resources Control Board (SWRCB) in Table 2 for Reach 2 of the Los Angeles River is based on the combined California 2010 303(d) List and includes pollutants that have a completed TMDL, pollutants that require development of a TMDL, and pollutants that are being addressed by actions other than a TMDL.

TABLE 2: LOS ANGELES RIVER REACH 2 303(d) LIST

Pollutant	Pollutant Category	Potential Source	Source Category
Ammonia	Nutrients	Point Source	Unspecified Point source
Ammonia	Nutrients	Non-Point Source	Unspecified Non-Point Source
Coliform Bacteria	Pathogens	Point Source	Unspecified Point Source
Coliform Bacteria	Pathogens	Non-Point Source	Unspecified Non-Point Source
Copper	Metals/Metalloids	Source Unknown	Source Unknown
Lead	Metals/Metalloids	Point Source	Unspecified Point Source
Lead	Metals/Metalloids	Non-Point Source	Unspecified Non-Point Source
Nutrients (Algae)	Nutrients	Point Source	Unspecified Non-Point Source
Nutrients (Algae)	Nutrients	Non-Point Source	Unspecified Non-Point Source

Appendix D includes a map obtained from the SWRCB that illustrates the TMDLs that are in effect for Los Angeles County as of October 2013. Multiple TMDLs are in effect for the Los Angeles River for the following pollutants:

- Bacteria
- Metals
- Trash
- Nutrients

Table 3 and Appendix D list the pollutants of concern for the Los Angeles River watershed management area, which the project site falls within.

TABLE 3: TIER 3 POLLUTANTS OF CONCERN FOR THE LOS ANGELES RIVER WATERSHED MANAGEMENT AREA

Parameter	Parameter
pH	Total Dissolved Solids
E. *coli* Bacteria	Turbidity
Total Coliform Bacteria [1]	Aluminum, Total Recoverable
Fecal Coliform Bacteria[1]	Cyanide, Total Recoverable
Enterococcus Bacteria [1]	Copper, Total Recoverable
Chloride	Mercury, Total Recoverable
Nitrite Nitrogen, Total (as N)	Selenium, Total Recoverable
Sulfate	

[1] Apply only to discharges to the estuary and the ocean

Summary

Table 4 summaries potential pollutants from the site based on land use along with pollutants of concern from the various sources described above.

TABLE 4: SUMMARY OF POTENTIAL POLLUTANTS AND POLLUTATIONS OF CONCERN

Nutrients	Metals	Organics	Other	Pathogens	Sediment/Solids
Algae	Aluminum	BOD	Chloride	Coliform Bacteria	Suspended Solids
Ammonia	Cadmium	COD	Hydrocarbons		Total Dissolved Solids
Kjedahl Nitrogen	Chromium		pH		Turbidity
Total Nitrogen	Copper		Sulfate		
Total Phosphorous	Cyanide		Trash		
	Lead				
	Mercury				
	Selenium				
	Zinc				

Groundwater

As indicated on the groundwater basin exhibit (Exhibit 6), the project site is located within the along the northern edge of the Los Angeles Forebay of the Central Basin, which is a sub-basin of the Los Angeles Coastal Plain. It is located a significant distance from existing stormwater spreading grounds shown in Exhibit 5. As such, stormwater runoff from the site will not provide recharge into existing stormwater spreading grounds or introduce pollutants into these spreading grounds.

Based on information from the *LAC+USC Medical Center Replacement Project Environmental Assessment/EIR Seismic Hazard Mitigation Program for Hospitals* (*LAC+USC Medical Center Seismic EIR)*, "within the forebay the site is situation along the southern edge of the Elysian Park-Repetto Hills, which are bisected by Los Angeles Narrows, a north-south trending valley underlain by Quaternary age alluvium deposited by the Los Angeles River. Quaternary age water-bearing deposits of the forebay area pinch out northward against Tertiary age sedimentary, including the Puente Formation". The groundwater flow in the vicinity of the site is generally towards the southwest.

The approximate location of the historic underground Arroyo De La Pasa River is depicted in Exhibit 35 (Appendix E) from the *LAC+USC Medical Center Seismic EIR.* The river flowed approximately southwesterly from the existing Clinical Research building south to the area near the existing Central Stream Plant and Central Laboratory buildings.

Water Supply

Based on preliminary utility research presented in the *Master Plan*, water service for LAC+USC is provided by the City of Los Angeles Department of Water and Power (LADWP). From the *LAC+USC Medical Center Building & Site Assessment Report*, existing water use is approximately 100,980 gallons/year from the Los Angeles County Utility System Billing summary from 9/20/2011 through 8/20/2011. These dates appear to be incorrect and seem to be intended to cover an approximately one-year time-period. Reclaimed water does not appear to be used at the site currently and irrigation demand is not separated from the overall demand from the entire campus.

According to the Water Quality section of the LADWP's website, approximately 15% of the water is obtained from groundwater from the San Fernando basin, which is partially shown on Exhibit 6. Remaining water supply sources includes approximately 60% from the Eastern Sierra via the Los Angeles Aqueduct system and from the Metropolitan Water District's Colorado and Feather River supplies.

Depth to Groundwater

As part of the October, 2013 *Phase I Environmental Site Assessment* prepared by Kimley Horn & Associates, Inc. for 1744 Zonal Avenue within the project site, it was noted that water table depths greater than six feet (ft) are common. This report also stated that "Liquefaction played a significant role in the damage sustained by the Medical Center during the Northridge earthquake.

Wherever water table levels are less than 10 feet, the potential for liquefaction is high. Conversely, where the water table is greater than 30 feet below land surface, the risk for liquefaction is low." This statement seems to imply that the depth to groundwater may be less than 30 ft below the land surface in parts of the project site.

The *LAC+USC Medical Center Seismic EIR* references subsurface borings where groundwater was encountered at depths ranging from approximately 20 to 45 ft at most borings on the site. It was also noted that groundwater was found in the underlying bedrock and alluvial units. Groundwater was typically encountered in steeply dipping sandstone beds under the semi-confined conditions of the bedrock. Based on the geotechnical study for that project, seepage of groundwater was found at depths ranging from 12 to 14 ft below natural ground in a portion of the site. In a prior geotechnical study in 2002, groundwater seepage was also found between 5 and 14.5 below natural ground. The *EIR* also references the *California Geotechnical Survey Seismic Hazard Zone* report, which indicates the historically highest groundwater level at the site is approximately 25 ft below natural ground.

Recharge

Soils within the project site are generally classified as loam or clay loam (Exhibit 7). These soil textures are typically placed within the Type C soil group (U.S. EPA EISA, 2009). Soils within these classifications typically have low saturated hydraulic conductivity rates in the range of 0.04 to 0.13 inches/hour (in/hr) (U.S. EPA SUSTAIN, 2009). Since the existing site has an impervious cover of approximately 95%, minimal recharge occurs into the Central Basin and does not contribute to supplies within the San Fernando Basin.

Contamination

Based on an October, 2013 *Phase I Environmental Site Assessment* prepared by Kimley Horn & Associates, Inc. for 1744 Zonal Avenue within the project site, two locations with petroleum contamination of groundwater were found within the greater LAC+USC Medical Center site. Locations are shown as Sites 4 and 5 on Figure 6 from that study (Appendix F).

No other sources or locations of groundwater contamination were found as part of the data review for this project.

Hydrology

Elevations within the LAC+USC Medical Center campus range from a low of approximately 320 ft in the southwestern portion of the site to a high of approximately 450 ft in the northeastern portion of the site (Exhibit 8). Overland flow within the site is generally from the northeast to the southwest. The northeastern corner of the site includes "the hill", which is vegetated with a mix of trees and understory vegetation, and also drains from north to south. Off-site flows into or through the site are minimal.

Slopes within the three "off-site" tracts located at the intersection of North Mission Road and Zonal Avenue are relatively flat with elevations of approximately 330 ft and overland flow is generally directed towards the adjacent roadways.

The Los Angeles River is located approximately one-mile west of the project site and overland flow in the vicinity is generally to the west towards the Los Angeles River. Surface water drainage in the site vicinity is generally towards the Los Angeles River. Extreme event stormwater runoff that exceeds the capacity of the on-site and public storm drain systems flows to the west/southwest towards the Los Angeles River. The confluence of the Rio Hondo River with the Los Angeles River is located approximately one-mile west of the project site.

As discussed, the existing site does not appear to include water quality or stormwater controls, such as stormwater BMPs, LID features, or hydromodification management facilities. Additionally, stormwater detention and other flood control features were not observed on-site. Instead, the existing site manages rainfall and stormwater runoff with vertical roof drains, catch basins and drain inlets, underground storm drain systems, curbs, gutters, overland sheet flow, driveways, and other means of conveyance into the on-site and off-site storm drain system.

As discussed previously, impervious cover at the existing site is approximately 95-percent (Exhibit 2) and stormwater management and runoff is typical of urbanized runoff from other sites with a similar period of construction. With the exception of "the hill", land use on the majority of the site consists of buildings and pavement. Because of the high level of impervious cover and improved conveyance system, peak flows and runoff volumes are significantly higher than from the same site in a natural or undeveloped condition.

In a similarly undeveloped site, the water budget would include much higher amounts of infiltration and evapotranspiration due to naturally vegetated (pervious areas) with depressions and other low spots for temporary rainfall ponding. The character of runoff due to the high amount of impervious cover and improved conveyance system has resulted in stormwater runoff from the existing site that would contribute to hydromodification within natural receiving systems. Since the Los Angeles River is concrete-lined in the vicinity of the site, hydromodification due to the existing site is limited. However, changes in the water budget due to the existing site may have impacted areas further downstream with sediment deposits and other natural features that can be disturbed by increases in flows or changes in the flow regime.

Stormwater runoff from the project site in assumed undeveloped conditions is estimated at 46.6 in (1.3 in/year [yr]), based on continuous simulation analysis of the period of record from 1970 – 2006. For existing conditions, stormwater runoff is 494.9 in (13.4 in/yr) for the same time-frame due to the high-level of impervious cover. Appendix B includes a hydrology memorandum prepared by Watearth, Inc. for the project and additional details on runoff rates and modeling assumptions are included in this memorandum.

While minimal erosion is expected from the majority of the site due to the high-level of impervious cover, there is potential for erosion and sedimentation within the northeastern portion of the site ("the hill") due to the steep slopes and presence of unvegetated land. Additionally, concrete-lined conveyance swales along the upper perimeter of "the hill" concentrate and direct runoff perpendicular to the natural slope of the land with the potential for increased runoff rates, and associated erosion at the outlet.

Hydraulics

From the *Master Plan* and visual observations during site reconnaissance, the existing storm drain system for the LAC+USC Medical Center campus utilizes vertical roof drains, underground storm drain pipes, overland sheet flow, curbs, gutters, catch basins, and driveways to convey stormwater runoff to the existing public system owned and operated by Los Angeles County Flood Control District (LACFCD). It is further stated in the *Master Plan* that the existing system is at the end of the expected life-cycle and is rated to be in Poor Condition.

As shown in the Existing Storm Drain Conveyance Concept Plan exhibit and summary table from the *Master Plan* (Appendices G and H), the eastern and southern portion of the campus is served by a private system of isolated storm drain laterals ranging in size from six-inch lines to an 11-x18-inch corrugated metal pipe (CMP) box. These small diameter storm drain systems discharge into a 36-inch RCP along the northern right-of-way (ROW) of Marengo Street, which is a public storm drain system.

The private system of storm drain laterals in the north-central portion of the campus range in size from 10-inch to 18-inch RCP and discharge into an existing public system within Zonal Avenue with diameters ranging from 18 to 36 in. The Zonal Avenue system then flows to west and discharges into an existing on-site, public storm drain system. The 4.5'-foot x 4-foot reinforced concrete box (RCB) flows from north to south through the western portion of the campus and is located between State Street and North Mission Road.

The western portion of the campus drains through a private system of storm drain laterals ranging from 4 to 6 in into an existing on-site, public 8-foot x 2-foot, 9-inch RCB, which flows from north to south through the western portion of the campus between State Street and North Mission Road and is parallel to and east of the 4.5-foot x 4-foot RCB. Both on-site, public RCBs eventually join together offsite, south of the IH-10 freeway and convey stormwater runoff to the Los Angeles River.

The Los Angeles River in the vicinity of the site consists of a concrete-lined trapezoidal channel with a low-flow section (photos 1-4, Appendix C). The configuration of the river in the vicinity of the site outfall provides an efficient conveyance system with minimal flood plain storage, habitat /ecology, recreational, or aesthetic benefits.

In the event that sheet flow leaves the project site, inlets are regularly spaced within the public roadways bordering the campus. As shown in the photos included in Appendix C, some of these inlets include the benefits provided by grates that help prevent trash from entering the storm drain system and the Los Angeles River watershed.

Flooding and Hazards

100-Year Flood Plain

As shown on Exhibit 3, the project site is located in Zone X outside of the regulatory 100-year flood plain of the Los Angeles River. The Flood Insurance Rate Map (FIRM) Panels shown in this exhibit include 06037C1628F, 06037C1629F, 06037C1636F, and 06037C1637F. These panels were updated on September 6, 2008. While the 100-year flood plain extends into the left overbank in the general region of the project site, it is located entirely west of IH-5.

There is no flood plain or floodway fill proposed as part of this project and no houses or other structures will be placed within the regulatory 100-year flood plain.

Dam Failure and Other Hazards

As shown in the Dam Hazard Inundation map included in Appendix I from the City of Los Angeles *Hazard Mitigation Plan*, dated January, 2011 and adopted July, 2011, the project site is not located within a potential inundation area for dam failure. Similarly, the project site is not located within a potential tsunami inundation area or seiche or landslide/mudslide hazard zone (see exhibits in Appendix I).

IMPACT ANALYSIS

The impact analysis is based on ultimate build-out of the LAC+USC Medical Center as described in the *Master Plan*. A brief summary of hydrology and water quality impacts of the adjacent University of Southern California (USC) Health Sciences Center (HSC) project is also included in this section for reference. Finally, cumulative hydrology and water quality impacts considering both projects are presented.

LAC+USC Medical Center Impacts

This section addresses impacts to surface water quality, groundwater, hydrology, and flooding/hazards related solely to ultimate build-out of the LA+USC Medical Center as described in the *Master Plan*.

LAC+USC Medical Center Surface Water Quality Impacts

Because of the changing nature of potential pollutants in the various stages of a project, impacts to surface water quality are discussed under the categories or Construction, Operations, and Operations/Maintenance of LID Features in the following sections.

Construction

During construction, site grading activities and exposed soil could temporarily increase the amount of suspended solids (sediment) in sheet flow or runoff into the existing storm drain system. Thus, surface water quality could potentially be temporarily affected by construction

activities. However, the project would be required to obtain and comply with the Construction General Permit (CGP) through the SWRCB. This permit and associated National Pollutant Discharge Elimination System (NPDES) requirements include development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) with associated monitoring and reporting. Stormwater BMPs are required to control erosion, minimize sedimentation, and control stormwater runoff water quality during construction activities. Additional source control BMPs would also be required to prevent contamination of runoff by potentially hazardous materials and eliminate non-storm water discharges.

Compliance with the CGP, SWPPP, NPDES requirements, and local regulations that require construction-phase BMPs would ensure that construction activities would not degrade the surface water quality of receiving waters to levels below standards considered acceptable by the Los Angeles regional water quality control board or other regulatory agencies or impair the beneficial uses of the receiving waters. Construction would not result in a violation of any water quality standards or waste discharge requirements, would not provide substantial additional sources of polluted runoff, and would not substantially degrade water quality. Construction-related impacts to surface water quality would be **less than significant** when in compliance with the above requirements and any other applicable regulations.

Operations

Based on the *Master Plan*, emphasis on the use of drought-tolerant and California native plants is planned for the site and the pervious area is anticipated to increase substantially. Additionally, proposed stormwater and LID features (bioretention and wetlands/detention) would include vegetation. While proposed lawn areas are limited in area, agricultural crops are encouraged and a green roof is proposed as an urban farm. The use of plant species with high-moderate water needs by Water Use Classifications of Landscape Species (WUCOLS) III will be limited in quantity and restricted to a similar water-use area.

Further, lower maintenance vegetation is planned and maintenance is anticipated to be performed by staff that is well-trained in California native landscapes. The *Master Plan* also states that the use of pollutants, chemicals, or soil amendments that can harm human or ecological health will be avoided. While not implicitly stated, this seems to imply that organic maintenance methods or Integrated Pest Management (IPM) will be used.

The *Master Plan* also indicates that vegetation and materials will be composted on-site for use as a soil amendment and that degraded soils will be improved. This practice would enhance the infiltration and storage capacity of soils thus reducing runoff. Provided that animal manure and animal products are not included in the mulch or compost used on-site, use of these materials will have a positive impact on runoff from the site.

Standard Urban Stormwater Mitigation Plan (SUSMP) requirements would be implemented and include source control BMPs, treatment control BMPs, and requirements regarding erosion control. Non-structural BMPs may include: providing storm drain stenciling and signage, containing properly designed outdoor materials storage areas, containing properly designed trash storage areas, providing proof of on-going BMP maintenance, and other items relevant to operations of the site.

Similar to existing conditions, stormwater runoff from the proposed site would be typical of urbanized areas and includes pollutants, such as sediment, hydrocarbons, oil, grease, heavy metals, nutrients, herbicides, pesticides, fecal coliform bacteria, and trash. The typical pollutants of concern for the existing site based on land use (Table 1) are similar for the proposed site.

LID features are also planned to meet requirements in the Los Angeles County *Low Impact Development Standards Manual*. Details are included in the hydrology memorandum prepared by Watearth, Inc. (Appendix B). The quality of surface water runoff is improved by infiltration of stormwater runoff and associated pollutants whereby the runoff and pollutants do not reach the receiving waters (Los Angeles River). Additionally, the LID features provide treatment control through physical, biological, and chemical processes to remove pollutants from the stormwater runoff. An important consideration in the design of bioretention is leaching of nutrients from the growing media into the stormwater runoff. Because nutrients are pollutants of concern for discharge from the site, the design of bioretention features on-site must include modifications to address potential leaching of nutrients.

Provided that design of LID features (especially bioretention) include modifications to address potential leaching of nutrients, compliance with the LA County LID criteria and other state and local regulations that require post-construction BMPs would ensure that operation of the site would not degrade the surface water quality of receiving waters to levels below standards considered acceptable by the Los Angeles regional water quality control board or other regulatory agencies or impair the beneficial uses of the receiving waters. Operation of the site would not result in a violation of any water quality standards or waste discharge requirements, would not provide substantial additional sources of polluted runoff, and would not substantially degrade water quality. Operation-related impacts to surface water quality would be **less than significant**.

Operations/Maintenance of LID Features

On-going Operations and Maintenance (O&M) activities for the proposed LID features at the site are summarized below and example O&M Fact Sheets are included in Appendix J. These O&M Fact Sheets are for reference only and should not be used for this project. While the Proposed Stormwater Conveyance Concept Plan exhibit from the *Master Plan* (Appendix K) includes only bioretention, permeable pavement, and wetlands/detention, other LID features mentioned in the *Master Plan* include infiltration trenches and cisterns for stormwater harvesting and use. For most LID features, sediment removal is one of the most important and significant maintenance activities to extend the life-cycle and effectiveness of the LID feature. Once LID features clog or reach the end of their life-cycle, major rehabilitation or reconstruction may be needed. Regular inspection of LID features is also a key component of a successful O&M Plan.

Bioretention maintenance requirements include removing sediment, trash, and debris to maintain the infiltration capacity. Additionally, shredded hardwood mulch should be removed and replaced annually to remove sediment and any accumulated metals captured by the mulch. Vegetation may require pruning as well as replanting of dead vegetation. Additionally, irrigation is typically required during the summer months. Because bioretention provides stormwater quality benefits, weeding should be done by hand and fertilizers, pesticides, and herbicides should not be used. Additionally, mulch and compost should not contain any manure or other animal products that may contribute nutrients to the stormwater runoff.

Maintenance requirements for wetlands/detention are similar to those for bioretention except the stormwater facility is larger and may include areas requiring mowing. For centralized detention, sediment removal may be required less frequently.

The primary maintenance requirement for infiltration trenches is removal of trash, debris, and sediment. Weeds and unwanted vegetation should be removed by hand and herbicides should not be used. With minor clogging, the surface layer of the pea gravel or rocks may need to be removed and replaced.

Typical maintenance activities for cisterns or stormwater harvesting system include checking and confirming the system operates as planned. Removal of sediment is also required when sediment accumulates to specified levels in the system. For cisterns or systems that include roofs in the catchment area, leaf debris and organic litter should be removed from inlets, downspouts, and leaf screens. The irrigation system, if included, also requires on-going maintenance typical of irrigation systems.

The maintenance activities associated with permeable pavement are geared towards removal of sediment and debris that may clog the pavement. Sweeping of leaf litter, debris, and sediment is needed to prevent organic materials from decomposing and clogging the pavement. For minor clogging, pressure washing may be used, while vacuum sweeping is recommended twice annually or more for areas with high sediment loads. Any weeds within the permeable pavement should be removed manually and herbicides should not be used.

An O&M Plan should be developed for LID features at the site and must consider impacts to water quality, including those discussed above (i.e., no fertilizers, pesticides, or herbicides and no animal manure or products in the compost or mulch) as well as other considerations. Development of and compliance with an O&M Plan would ensure that O&M of LID features at the site would not degrade the surface water quality of receiving waters to levels below standards considered acceptable by the Los Angeles regional water quality control board or other regulatory agencies or impair the beneficial uses of the receiving waters. O&M of LID features at the site would not result in a violation of any water quality standards or waste discharge requirements, would not provide substantial additional sources of polluted runoff, and would not substantially degrade water quality. O&M of LID features results in impacts to surface water quality that would be **less than significant**.

LAC+USC Medical Center Groundwater Impacts

As indicated in the *Master Plan* and the *Building and Site Assessment Report*, water demands are projected to increase at the site. While not specifically stated, the increase is likely due to increased utilization of facilities at the LAC+USC Medical Center as well as an increase in irrigation demand due to increased landscape areas.

Overall regional water demand is primarily a function of population growth. Although the project would likely lead to increases in indoor water demand at the site, it would not increase overall population within the region. Additionally, indoor fixtures would be required to comply with City ordinances in the Los Angeles Municipal Code (LAMC) related to reducing indoor water consumption. The City of Los Angeles Plumbing Code (Chapter IX, Article 4, of the LAMC) references the California Plumbing Code, which establishes maximum flow rates for indoor water fixtures. City Ordinance No. 180,822 further establishes water efficiency requirements for renovation, redevelopment, and new development and mandates installation of high efficiency plumbing fixtures in residential and commercial buildings (City of Los Angeles Municipal Code, April 2012). These requirements would reduce potential increases in indoor water usage at the project site.

As indicated, impervious area would decrease significantly and landscaped areas would increase as a result of the project. While multiple design and maintenance principles to reduce the use of potable water for irrigation are planned and discussed below, increased landscape areas at the site are likely to result in an increased use of groundwater for irrigation. While infiltration and groundwater recharge at the site are expected to increase by approximately 657% (see hydrology memorandum by Watearth, Inc. in Appendix B) due to increased pervious areas and incorporation of LID features, recharge is into the Central Basin and groundwater supplies are obtained from the San Fernando basin.

Even with substantial increases in infiltration, groundwater contamination is not likely to occur due to typical depths to groundwater at the site found in previous studies referenced in the Settings/Existing Conditions section. Additionally, landscape maintenance methods used for the project would avoid the use of pollutants, chemicals, or soil amendments that can harm human and ecological health.

Based on the General Landscape Guidelines contained in the *Master Plan*, reclaimed water will be used for irrigation if available. If not available, use of an onsite reclaimed water treatment system will be investigated. Although the Master Plan states that use of captured rainwater (stormwater) or gray water shall be considered where appropriate, percentages or amounts of irrigation to be met by these sustainable alternatives to potable water are not specified. Wasted irrigation water is planned to be reduced through proactive maintenance of the irrigation system and best irrigation practices, such as seasonally reprogramming the system and irrigating at appropriate times of the day are planned.

Based on the *Master Plan*, emphasis on the use of drought-tolerant and California native plants is planned for the site. The use of plant species with high-moderate water needs by WUCOLS III will be limited in quantity and restricted to a similar water-use area. While proposed lawn areas

are limited in area, agricultural crops are encouraged. Further, lower maintenance vegetation is planned and maintenance is anticipated to be performed by staff that is well-trained in California native landscapes. The use of compost, soil amendments, and mulch is also planned to enhance infiltration and storage of stormwater runoff within the landscape, thus reducing reliance on irrigation.

Water use would increase during project operation due to the increased number of persons utilizing the LAC+USC Medical Center facilities and for landscape maintenance. While the project would increase indoor water demand at the site, it would not lead to a significant increase in demand for potable water for indoor use in the region. The project would increase use of potable water and groundwater for irrigation demands. By incorporating reclaimed water, gray water, and harvested rainwater as planned for irrigation, the increased demand for groundwater for irrigation can be reduced.

For these reasons, the water demand associated with the proposed project would not appear to substantially deplete groundwater supplies. The project would increase groundwater recharge and would not interfere substantially with groundwater recharge. Impacts during operation would be **less than significant with mitigation incorporated.** Mitigation measures are described below in the Recommended Mitigation Measures section.

Construction activities could require excavation below normal or seasonally high ground water levels. It is also possible that seepage may be encountered due to groundwater depths on the site and dewatering may be necessary. However, seepage encountered during construction could be mitigated as needed by constructing small drainage swales from the base of the excavations to temporary sump pits or stormwater/LID features on-site.

Any discharge of groundwater during construction would be required to comply with applicable NPDES permit requirements. The project would also comply with all applicable federal, state, and local requirements concerning the handling, storage, and disposal of hazardous materials to effectively reduce the potential for the construction of the project to release contaminants into groundwater. Thus, construction activities would not degrade groundwater quality or interfere with recharge. Water use may be increased on a limited, temporary extent during the construction-phase and construction-phase impacts would be **less than significant**.

LAC+USC Medical Center Hydrology Impacts

As part of the project, impervious surfaces are proposed to be reduced from approximately to 95% to 75% or less. Existing impervious surfaces will be replaced with new impervious surfaces and additional landscape areas. While general sheet flow patterns and existing slopes will generally be maintained, the existing slope of "the hill" area is planned to be lessened to provide an accessible route. Vegetation within the site is planned to consist of forested areas, lawns, and native and drought-tolerant vegetation. Agricultural land use is encouraged in the form of a community garden and a community farm located on top of a proposed parking structure (i.e., a green roof).

LID features are also planned to meet requirements in the Los Angeles County *Low Impact Development Standards Manual*. The goal of the LID features is to provide stormwater quality benefits and to more closely mimic undeveloped site hydrology. LID features are required to retain 100-percent of the SWQDv on-site through a combination of infiltration, evapotranspiration, and stormwater harvest and use unless it is demonstrated that it is technically infeasible to do so. For this project, the SWQDv is 0.95 in and details are included in the hydrology memorandum prepared by Watearth, Inc. (Appendix B).

Based on the LID features illustrated in the Proposed Stormwater Conveyance Concept Plan exhibit from the *Master Plan* (Appendix K) and assumed configurations documented in the hydrology memorandum (Appendix B), the proposed LID features seem adequate to meet SWQDv requirements assuming storage within the growing media and drain rock layers is considered. Without these layers, additional LID features may be needed to meet requirements. Regardless, the proposed site will be required to meet SWQDv requirements and the LID extent may be increased as needed or stormwater harvesting and use may be incorporated. The project is likely to be exempt from hydromodification management requirements as it is a redevelopment project anticipated to result in less impervious cover than existing conditions.

The proposed impervious cover and LID features illustrated on the Proposed Stormwater Conveyance Concept Plan exhibit from the *Master Plan* (Appendix K) result in lower peak flows in proposed conditions than existing conditions for both the 10-year, 24-hour (206 cubic feet per second [cfs] for existing and 155 cfs for proposed) and 100-year, 24-hour (328 cfs for existing and 253 cfs for proposed) design storm events, which are representative of storm drain sizing and flood control events, respectively.

A continuous simulation analysis of undeveloped, existing, and proposed conditions at the project site is performed for the period of rainfall record from 1970 – 2006 with a total rainfall depth of 571 in. Based on these results, the water budget is more similar to an undeveloped site (46.6 in of total runoff with 521.5 in or infiltration and 2.9 in of evaporation) in proposed conditions than existing conditions. Surface runoff from the site in existing conditions is 494.9 in and reduced to 323.4 in proposed conditions. Existing conditions infiltration and evaporation are 25.4 in and 51.5, respectively. Proposed conditions with the planned LID features results in infiltration and evaporation of 192.3 in and 56.7 in, respectively, over the 37 –year period of analysis. Modeling details and results are reported in the hydrologic analysis memorandum prepared by Watearth, Inc. and included in Appendix B.

In addition to the LID features, drainage from the proposed site improvements will be handled through a new storm drain system sized for proposed stormwater runoff from the site. The on-site storm drain system will drain into proposed detention/retention areas located approximately at the center of new development on the west campus (Appendix K). These basins will discharge into the public storm drain systems. Peak flow rates and runoff volumes discharged from the campus will be the same or lower than existing conditions and will not affect the capacity or hydraulic integrity of the existing public storm drain system.

Peak flow rates and runoff volumes of stormwater during construction would generally be less than occurs under existing conditions, since the existing site is 95% impervious cover and drains directly through improved conveyance systems into the storm drain system and receiving waters (Los Angeles River). The impervious cover would not increase during construction and at various stages of construction would be less than the existing impervious cover.

There is no evidence of substantial erosion problems onsite and none would be expected as a result of the proposed project post-construction. During the construction phase of the project, standard construction-phase BMPs would decrease the potential for any significant erosion or sedimentation from soil disturbance associated with construction of the project. Standard construction practices relating to erosion and sediment controls will be required as part of the permitting process.

The project does not substantially alter the existing drainage pattern of the site, area, or receiving waters, or result in substantial erosion or siltation on- or off-site. With the increased pervious (landscape) areas and use of LID features, the amount of stormwater runoff via surface sheet flow and storm drain system is anticipated to decrease as a result of the project. As such, the project will not result in a substantial increase in the rate or amount of surface runoff or result in flooding on- or off-site. Impacts would be **less than significant**.

LAC+USC Medical Center Flooding and Hazards Impacts

As shown on Exhibit 3, the project site is located in Zone X outside of the regulatory 100-year flood plain of the Los Angeles River. The Flood Insurance Rate Map (FIRM) Panels shown in this exhibit include 06037C1628F, 06037C1629F, 06037C1636F, and 06037C1637F. These panels were updated on September 6, 2008. There is no flood plain or floodway fill proposed as part of this project and no houses or other structures will be placed within the regulatory 100-year flood plain. As such, there is **no impact** to the effective (existing) levels of flood plain storage or conveyance of flood flows by the Los Angeles River. The site is not located within a potential inundation area for dam failure (City of Los Angeles, January, 2011). Therefore, there is no potential for inundation at the site as a result of an earthquake-induced dam failure. **No impact** would occur.

The project site is not located within a tsunami hazard zone (City of Los Angeles, January, 2011). **No impact** would occur**.** The project site is not located within a seiche or landslide/mudslide hazard zone (City of Los Angeles, January, 2011). **No impact** would occur**.**

USC Health Sciences Center Impacts

The modified project impacts for the USC HSC described in the *Addendum to the EIR* are less than significant for hydrology, surface water quality, and groundwater. The potential for impacts in each of these areas is summarized in the following sections.

Hydrology Impacts of Adjacent USC HSC

Existing impervious surfaces will be replaced with new impervious surfaces and additional landscaping. With the additional landscaping, the rate and amount of storm water runoff would decrease slightly compared to the original project and would continue to be captured by the existing storm drain infrastructure or any new drainage system installed as part of the project. The amount of surface runoff would not substantially increase and the existing drainage pattern of the site would not be altered

Development of the modified project would not result in an increase of the amount of impervious surface that could contribute additional runoff. The original project is not located within a 1OO-year flood plain or within an inundation area associated with the failure of a levee or dam. Therefore the project would result in less than significant impacts to hydrology.

Surface Water Quality Impacts of Adjacent USC HSC

Compliance with NPDES requirements and local criteria for stormwater BMPs would ensure that construction activities would not impair the beneficial uses of the receiving waters or degrade the surface water quality of receiving waters to levels below standards considered acceptable by the Los Angeles regional water quality control board. The existing drainage pattern of the site would not be altered and the amount of surface runoff would not substantially increase during construction. Activities during construction would not result in a violation of any water quality standards or waste discharge requirements and would not substantially degrade water quality. Construction-related impacts to surface water quality would be less than significant.

Typical urban pollutants, including oil and grease, metals, fertilizers, pesticides, dirt from landscaped areas, and litter would be produced during the operation of the site. However, with the proposed additional landscaping, the amount of pervious area within the HSC would be increased and result in a reduced potential for urban pollutants to enter the storm drain system. SUSMP requirements would be implemented and include source control BMPs, treatment control BMPs, and requirements regarding erosion control. By complying with these requirements, impacts to surface water quality during operation would be less than significant.

Groundwater Impacts of Adjacent USC HSC

The project would replace existing primarily impervious surfaces with new impervious surfaces and additional landscaping and would not result in an increase of impervious cover. Impacts to groundwater hydrology would be less than significant.

Based on the geotechnical study, minor to moderate seepage of groundwater was found at depths ranging from 12 to 14 ft below natural ground. In a prior geotechnical study in 2002, groundwater seepage was also found between 5 and 14.5 ft below natural ground. The *California Geotechnical Survey Seismic Hazard Zone* report indicates the historically highest groundwater level at the site is approximately 25 ft below natural ground.

While seepage may be encountered during construction as excavation may be required up to 30 ft below natural ground and dewatering may be necessary, any discharge of groundwater during construction would comply with the applicable NPDES permit requirements. The project would also comply with all applicable federal, state, and local requirements concerning the handling, storage, and disposal of hazardous materials to reduce the potential for groundwater contamination during construction. Construction activities would not degrade groundwater quality and impacts would be less than significant.

Cumulative Impacts

Surface Water Quality Cumulative Impacts

For both projects, compliance with the CGP, SWPPP, NPDES requirements, and local regulations that require construction-phase BMPs would ensure that construction activities would not degrade the surface water quality of receiving waters to levels below standards considered acceptable by the Los Angeles regional water quality control board or other regulatory agencies or impair the beneficial uses of the receiving waters. Construction would not result in a violation of any water quality standards or waste discharge requirements, would not provide substantial additional sources of polluted runoff, and would not substantially degrade water quality. Construction-related impacts to surface water quality would be **less than significant** when in compliance with the above requirements and any other applicable regulations.

The proposed project includes a reduction in impervious area and LID features for stormwater quality treatment. As discussed in the hydrology memorandum (Appendix B), proposed stormwater discharges would be less than existing for design storm events and the historical period of record from 1970 – 2006. The reduction in runoff also leads to a reduction in pollutants discharged from the site.

Similar to existing conditions, stormwater runoff from the proposed site would be typical of urbanized areas and includes pollutants, such as sediment, hydrocarbons, oil, grease, heavy metals, nutrients, herbicides, pesticides, fecal coliform bacteria, and trash. The *Master Plan* indicates that the use of pollutants, chemicals, or soil amendments that can harm human or ecological health will be avoided.

Provided that design and O&M of LID features address potential leaching of nutrients, compliance with the LA County LID criteria and other state and local regulations that require post-construction BMPs would ensure that operation of both sites would not degrade the surface water quality of receiving waters to levels below standards considered acceptable by the Los Angeles regional water quality control board or other regulatory agencies or impair the beneficial uses of the receiving waters. Operation of both sites would not result in a violation of any water quality standards or waste discharge requirements, would not provide substantial additional sources of polluted runoff, and would not substantially degrade water quality. Operation-related impacts to surface water quality from both sites would be **less than significant**.

Groundwater Cumulative Impacts

For both projects, seepage encountered during construction may require mitigation through dewatering and temporary construction of drainage features or direction of seepage water to stormwater/LID features on-site. Both projects would be required to comply with applicable NPDES permit requirements for any discharge of groundwater. Both projects would also be required to comply with all applicable federal, state, and local requirements concerning the handling, storage, and disposal of hazardous materials to effectively reduce the potential for the construction of the project to release contaminants into groundwater. Thus, construction activities at both sites would not degrade groundwater quality or interfere with recharge. Water use may be increased on a limited, temporary extent during the construction-phase and construction-phase impacts would be **less than significant** for both sites.

Water demand is not expected to increase significantly as a result of the USC HSC. While water use would increase during project operation at the LAC+USC Medical Center facilities, it would not lead to a significant increase in demand for potable water for indoor use in the region. The LAC+USC Medical Center project would incorporate alternative and sustainable water supply sources (i.e., reclaimed water, gray water, and harvested rainwater) to help meet increased irrigation demands.

For these reasons, the water demand associated with the proposed projects would not appear to substantially deplete groundwater supplies. The projects would increase groundwater recharge and would not interfere substantially with groundwater recharge. Impacts during operation of both sites would be **less than significant with mitigation incorporated.** Mitigation measures are described below in the Recommended Mitigation Measures section.

Hydrology Cumulative Impacts

The proposed impervious cover is less than the existing impervious cover for the LAC+USC Medical Center and the adjacent USC HSC projects. Additional landscaping (pervious areas) is planned for both projects and the LAC+USC Medical Center would incorporate LID features to further reduce the stormwater runoff (peak flows and volume) from the site. Further, the LID features will shift the water budget at the site closer to the historical, undeveloped water budget as compared with existing conditions. With the LID features and increased landscape areas, higher infiltration levels and lower runoff will occur than under existing conditions. Details of the hydrology and LID modeling are included in the hydrology memorandum by Watearth, Inc. (Appendix B).

For both projects, compliance with construction-phase permits and standard construction-phase BMPs would decrease the potential for any significant erosion or sedimentation from soil disturbance associated with construction of the project. Stormwater runoff is also anticipated to be less than or equal to existing conditions runoff during construction. Therefore the cumulative effects of both projects would result in **less than significant impacts** to hydrology.

Flooding and Hazards Cumulative Impacts

Both the LAC+USC Medical Center and USC HSC projects are located outside of the regulatory 100-year flood plain of the Los Angeles River and outside of potential inundation area for dam failure. Neither project includes flood plain or structures within the regulatory 100-year flood plain. **No impact** would occur.

Both the LAC+USC Medical Center and USC HSC sites are located outside of a tsunami hazard zone and **no impact** would occur. Neither site is located within a seiche or landslide/mudslide hazard zone. **No impact** would occur**.**

RECOMMENDED MITIGATION MEASURES

Impacts to surface water quality and hydrology would be less than significant for the LAC+USC Medical Center and the cumulative impacts considering the adjacent USC HSC would also be less than significant. No additional mitigation measures other than those mentioned above and summarize below are required, provided that applicable permits and criteria are complied with at the time of development:

1. During each phase of construction, the County shall require the contractor(s) to develop a SWPPP and erosion/sediment control plan and submit their plan for approval to the governing regulatory agency. The contractor's erosion control plan must comply with the California *Stormwater Best Management Practices Handbook* and meet requirements of the Statewide CGP.

2. Alternative water supply sources for irrigation should be maximized to reduce potable water use for irrigation and approximate existing irrigation demands. Alternative water supply sources include, but are not limited to: reclaimed water, gray water, harvested rainwater (stormwater), and air conditioning condensate (while not specifically mentioned in the *Master Plan*, this could represent a significant source of clean irrigation water).

3. Where groundwater seepage is expected, permanent monitoring wells shall be installed during construction within and around the perimeter of each building to monitor the groundwater level and evaluate the performance of the dewatering system. Before starting dewatering operations, a baseline conditions survey shall be made of all adjacent foundations and structures to assess the impact of deep excavation dewatering on adjacent structures and all signs of existing distress shall be recorded.

4. During and post-construction, positive drainage should be provided away from buildings and foundations. Where positive drainage is not provided, area drains should be used to drain depressions or low spots that are not part of designed LID features. Area drains should not be placed next to or in contact with buildings. All area drains and LID features should be located a minimum of 8 feet away from building foundations or as directed in the International Building Code (IBC) or other regulatory requirements. Roof drainage should be controlled and directed to proper drainage devices in an acceptable manner or directed into LID features.

5. LID features shall be designed to improve water quality and minimize leaching of nutrients from growing media. Best design practices based on the latest monitoring and research recommendations should be incorporated. In addition to avoiding use of growing media, mulch, and compost containing animal products that may leach nutrients, other design modifications may include incorporating an internal storage zone (IST). With an IST, the underdrain is elevated and anaerobic conditions are created causing denitrification to occur provided that a carbon food source is provided for the denitrifying bacteria. Additionally, if Phosphorous is a concern secondary treatment may be required or use of a specialized growing media to avoid leaching of this nutrient. While these practices apply specifically to bioretention, they should also be considered for other landscape-based LID features that are included in the final design.

6. An O&M Plan should be developed for LID features at the site and must consider impacts to water quality. The O&M Plan should specifically address the use of IPM or organic maintenance practices, including hand weeding. Fertilizers, pesticides, herbicides, and products containing animal manure or products should be avoided.

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EXHIBITS

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Exhibit 2 – Aerial Photograph
Exhibit 3 – FIRM Panels 06037C1628F, 06037C1629F, 06037C1636F, and 06037C1637F
Exhibit 4 – Subwatershed Boundaries
Exhibit 5 – Stormwater Spreading Grounds
Exhibit 6 – Groundwater Basins
Exhibit 7 – Soil Types
Exhibit 8 – Topographic Map

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Appendix J – Example O&M Fact Sheets for LID Features Anticipated at Site
Appendix K – Proposed Stormwater Features Plan from Master Plan

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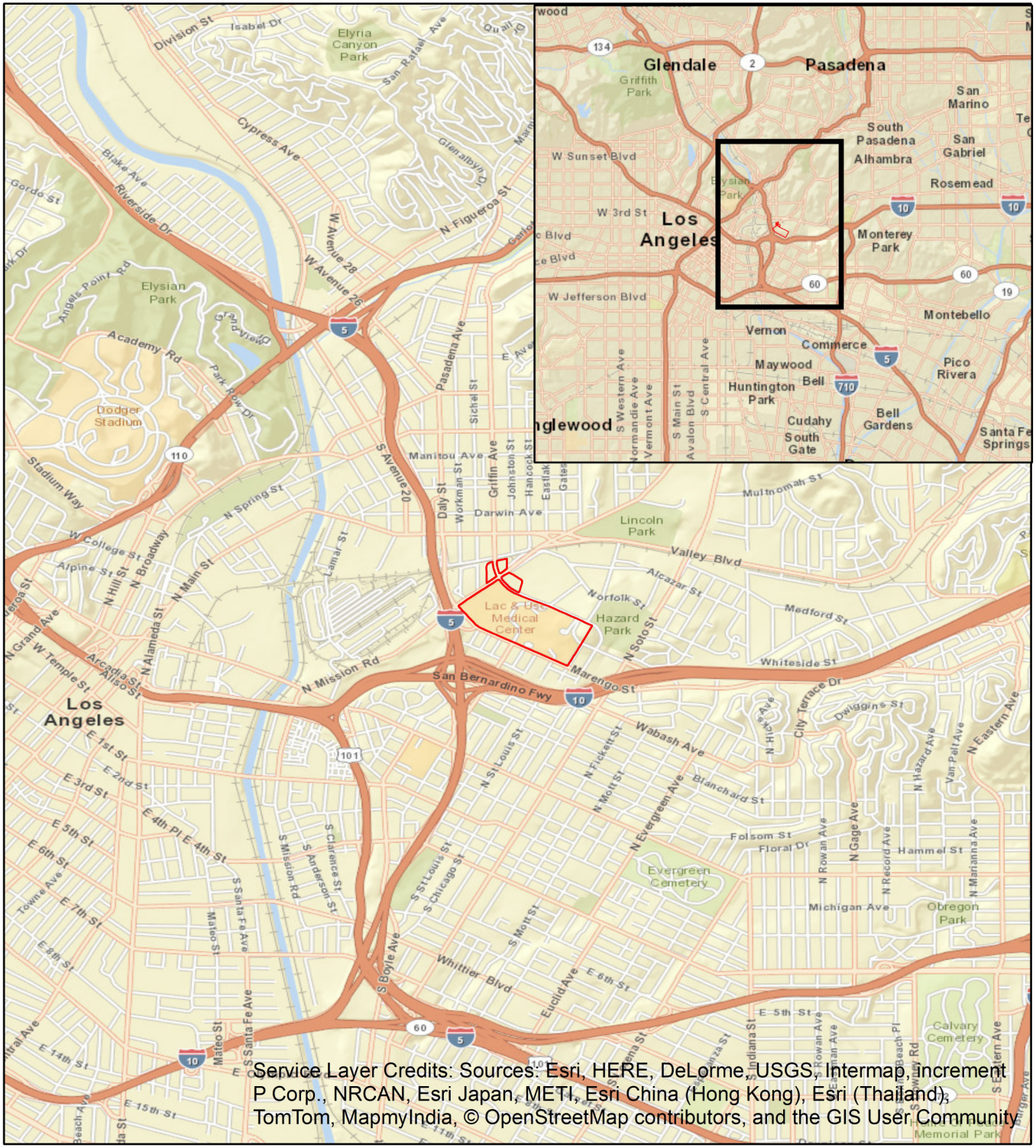
Water Resources + Green Infrastructure

APPENDIX A - EXHIBITS



Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

North

0 2,500 5,000 10,000 Feet

1 inch = 4,000 feet

Legend

Project Boundary

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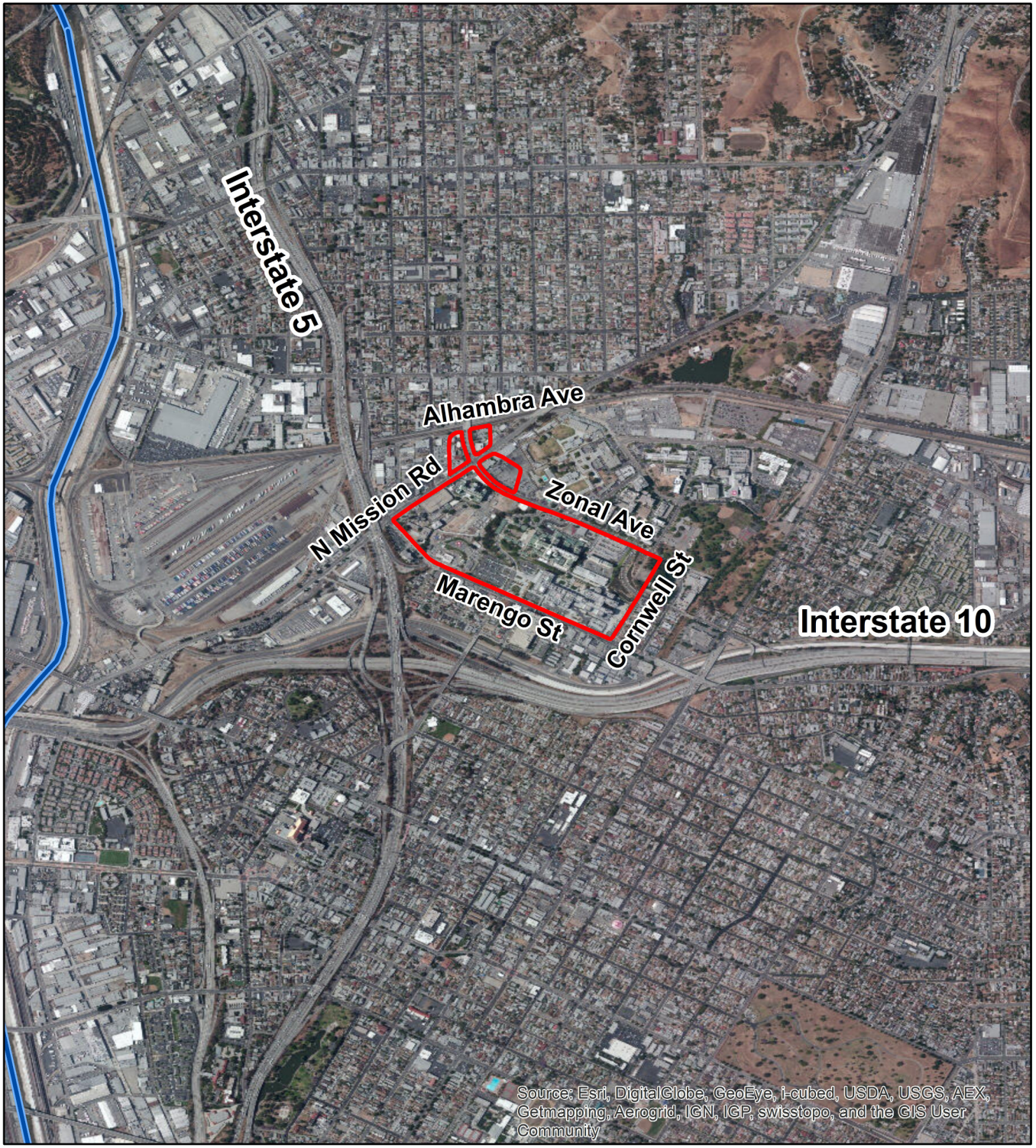
LA+USC Medical Center Master Plan EIR

EXHIBIT 1
VICINITY MAP



North

Feet

0 1,250 2,500 5,000

1 inch = 2,000 feet

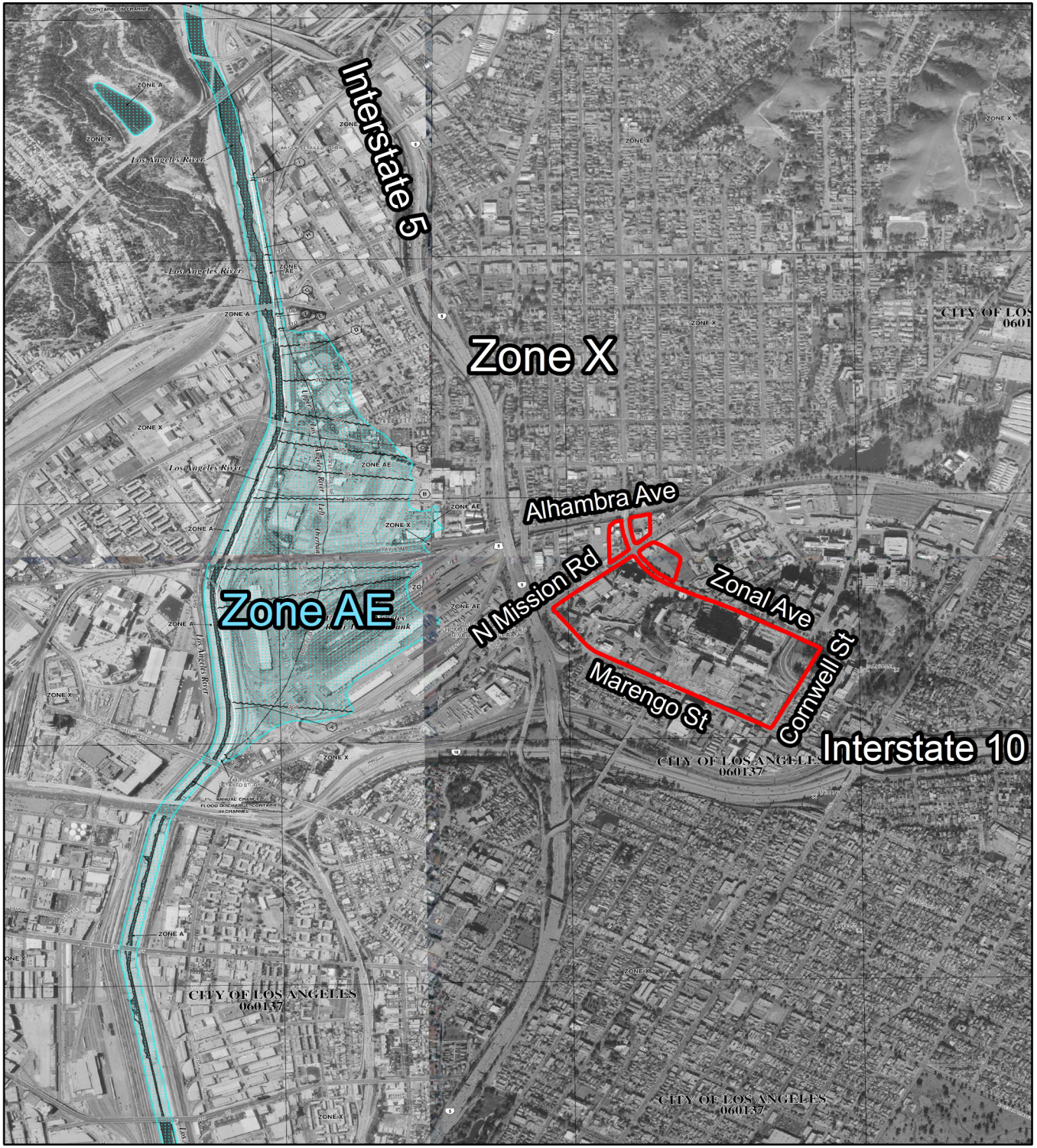
Legend

- Los Angeles River
- Project Boundary

Watearth™

LA+USC Medical Center Master Plan

EXHIBIT 2
AERIAL PHOTOGRAPH



North

Feet

0 1,200 2,400 4,800

1 inch = 2,000 feet

Legend

Project Boundary

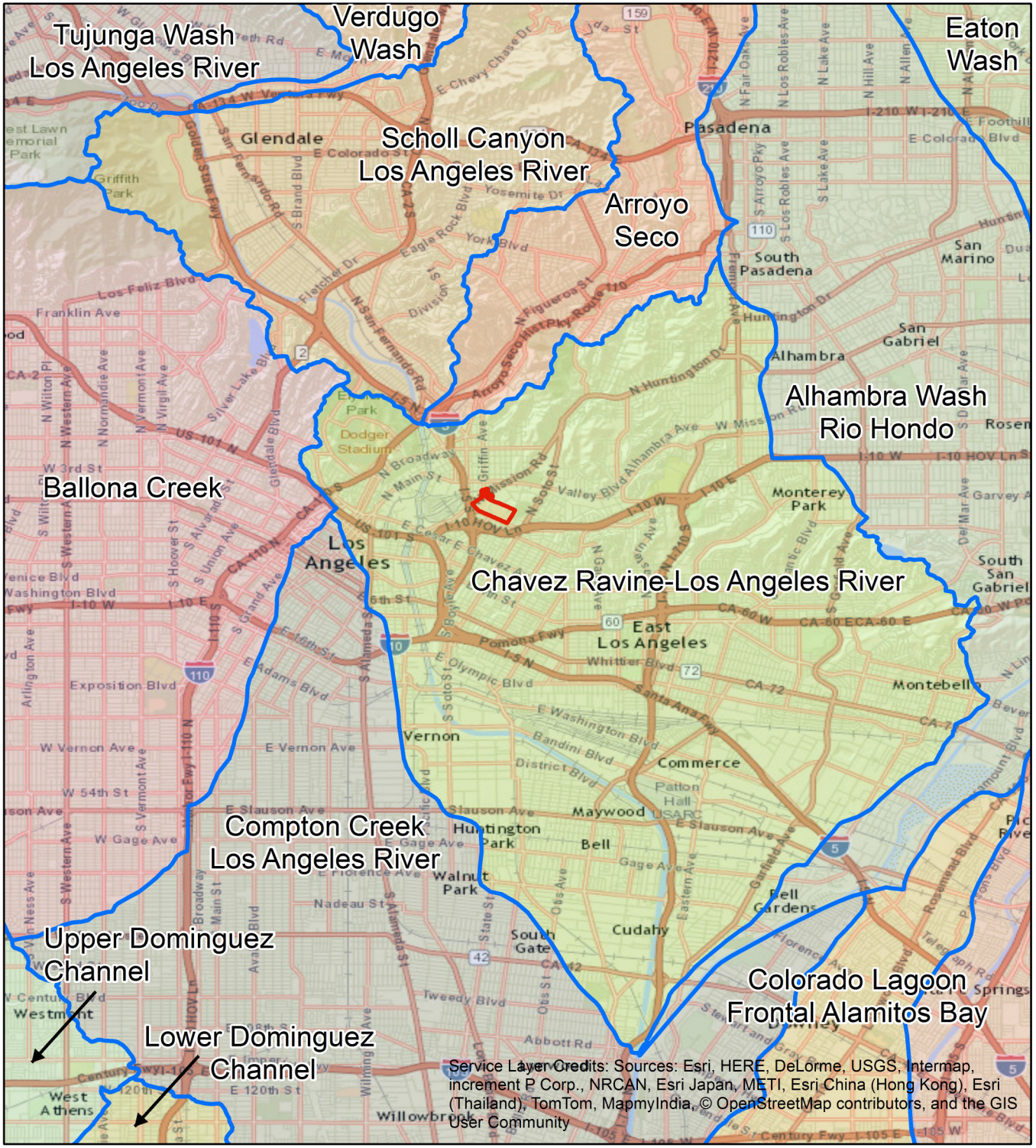
Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 3

FIRM PANELS

06037C1628F, 06037C1629F,
06037C1636F, 06037C1637F
Panels updated 9/26/2008



North

Feet

0 7,500 15,000 30,000

1 inch = 12,500 feet

Legend

- USGS NHD Subwatershed
- Project Boundary

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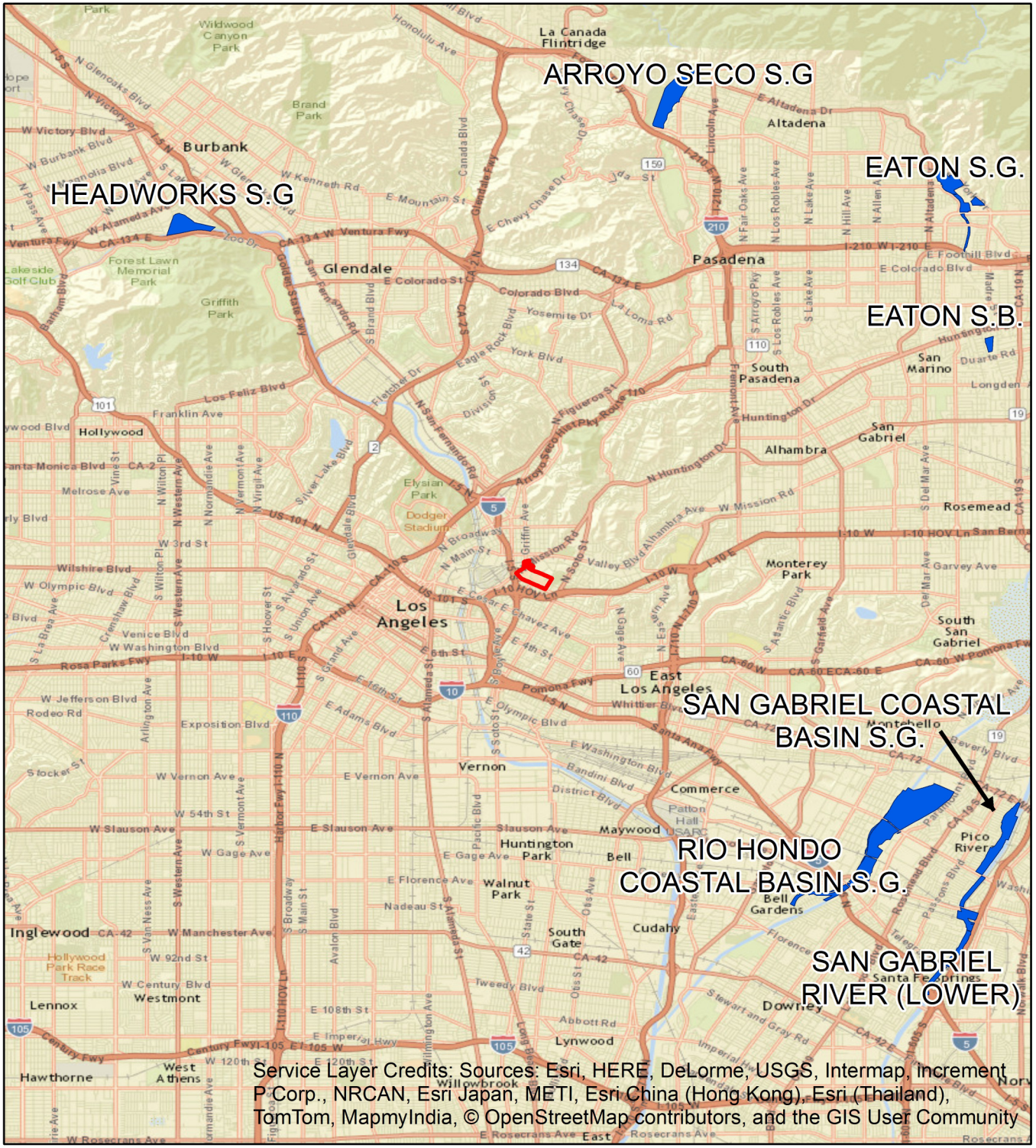
LA+USC Medical Center Master Plan EIR

EXHIBIT 4

Subwatershed Boundaries



North

Feet

0 9,000 18,000 36,000

1 inch = 15,000 feet

Legend

Spreading Grounds

Project Boundary

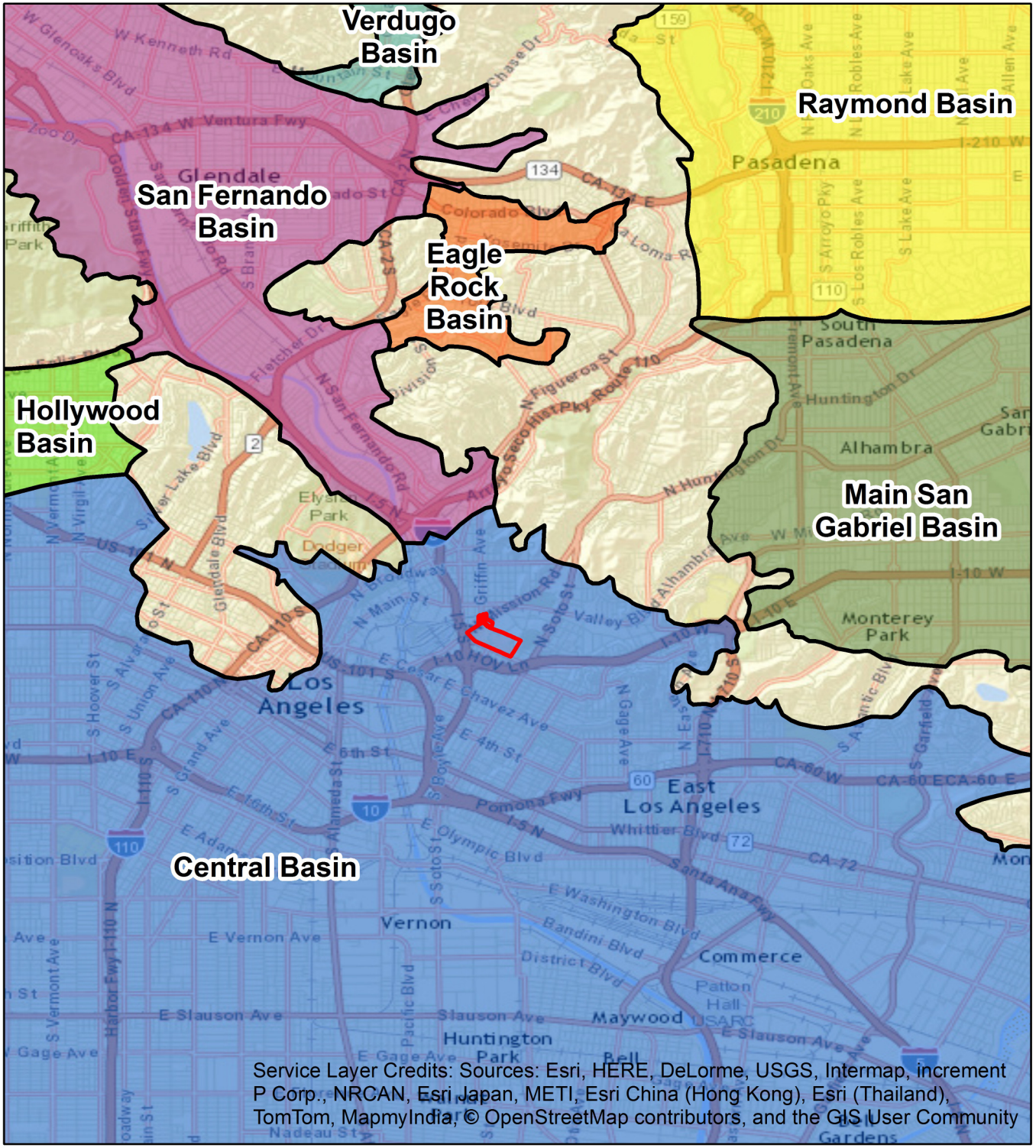
Watearth™

LA+USC Medical Center

EXHIBIT 5

Stormwater Spreading Grounds

Spreading Grounds data from Los Angeles Co. Dept. of Public Works



North

0 6,250 12,500 25,000 Feet

1 inch = 10,000 feet

Legend

- Ground Water Basins
- Project Boundary

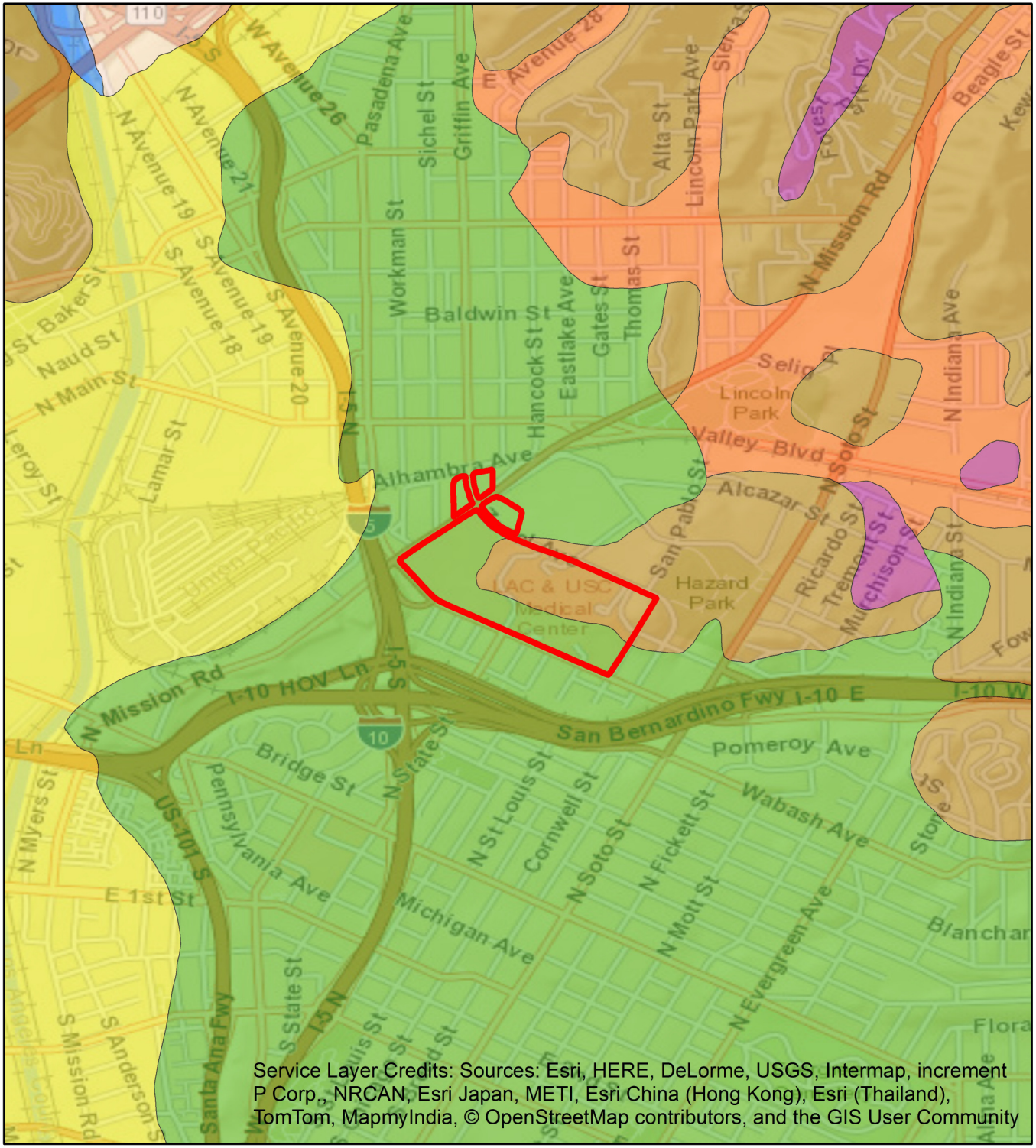
Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 6

Groundwater Basins

Ground water basin data from
Los Angeles Co. Dept. of Public Works



North

Feet

0 1,300 2,600 5,200

1 inch = 2,000 feet

- Project Boundary
- Altamont Clay Loam
- Ramona Loam
- Yolo Clay Loam
- Tujunga Fine Sandy Loam
- Handford Gravelly Sandy Loam
- Handford Fine Sandy Loam
- Diablo Clay Loam

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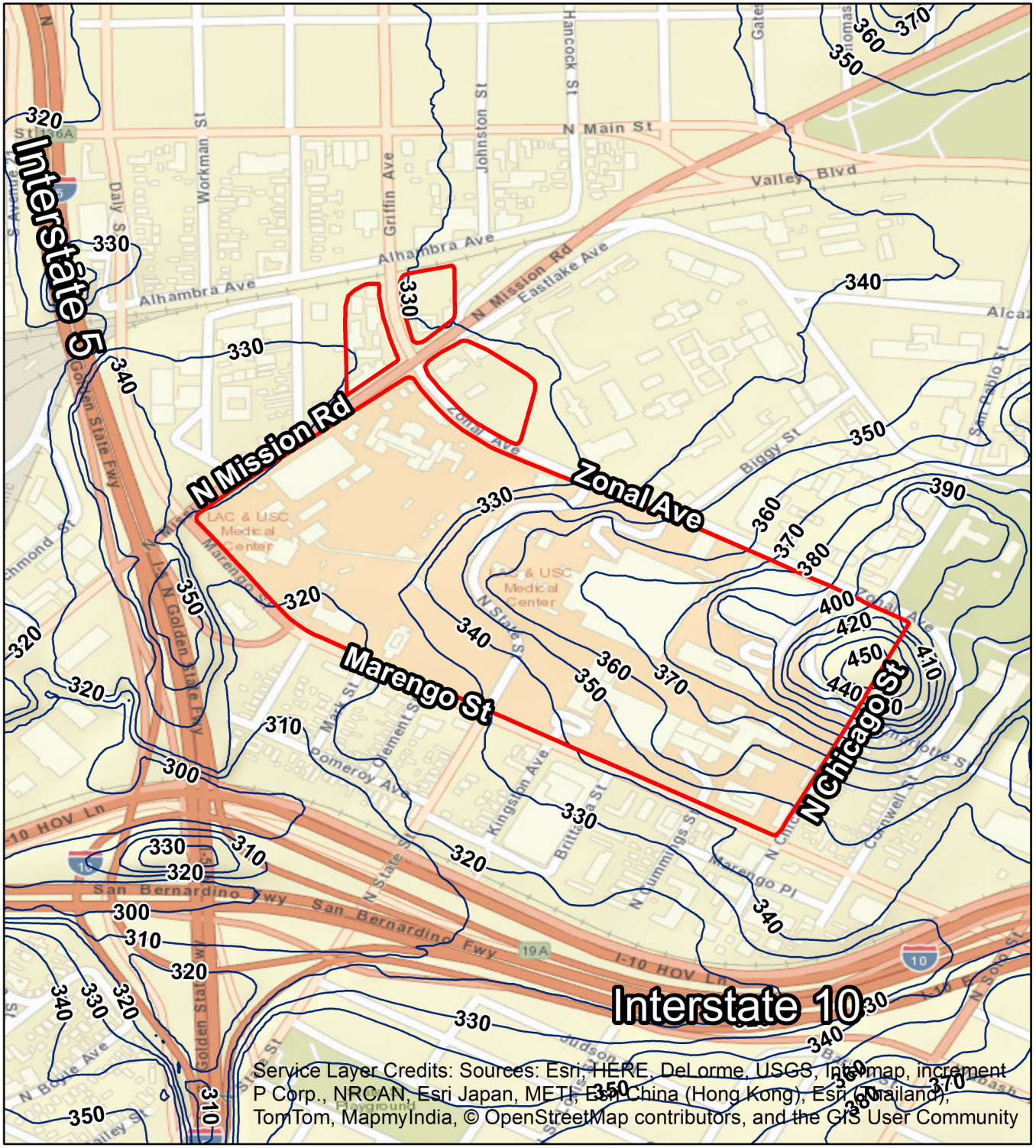
LA+USC Medical Center Master Plan EIR

EXHIBIT 7

Soil Types

Soil data from Los Angeles Co.
Dept. of Public Works, Water Resources Division



North

0 500 1,000 2,000 Feet

1 inch = 750 feet

Legend

- Project Boundary
- 10ft Contour

Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 8

Topographic Map

Elevation data from
USGS National Elevation Dataset

APPENDIX A – ADDENDUM TO THE EIR FOR THE USC HEALTH SCIENCES CAMPUS PROJECT

Los Angeles City Planning Department

City Hall • 200 N. Spring Street, Room 750 • Los Angeles, CA 90012

ADDENDUM TO THE

ENVIRONMENTAL IMPACT REPORT

FOR THE

USC HEALTH SCIENCES CAMPUS PROJECT

March 2013

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ADDENDUM TO THE ENVIRONMENTAL IMPACT REPORT FOR THE USC HEALTH SCIENCES CAMPUS PROJECT

I. Introduction/Background

This document is an Addendum to the Environmental Impact Report (EIR) prepared for the University of Southern California Health Sciences Campus Project (State Clearinghouse No. 2004101084), certified by the City of Los Angeles in August 2006 (Certified EIR). In accordance with the California Environmental Quality Act (CEQA), this Addendum analyzes proposed modifications to the development program for the Health Sciences Campus (HSC) Project to determine whether such modifications would result in any new significant environmental impacts or a substantial increase in the severity of impacts set forth in the Certified EIR.

The Certified EIR analyzed the development of between 585,000 and 765,000 square feet of additional academic and medical-related floor area within the existing Health Sciences Campus in northeast Los Angeles (the Original Project). The Certified EIR analyzed this range of square footages to allow for flexibility in the mix of uses. Medical clinic uses generally have a greater potential to result in environmental impacts as compared to academic or medical research uses. Therefore, an increase in medical clinic uses would require a reduction in academic and/or medical research uses in order for the entire project to remain within the overall environmental envelop analyzed in the Certified EIR. For example, under the Original Project, up to 120,000 square feet[1] of medical clinic uses could be developed with the remainder of the HSC developed with up to 465,000 square feet of academic and/or medical research facilities. In addition, in the event that on-site development were to reach 765,000 square feet, a total of 720,000 square feet of academic and/or medical research uses could be developed, together with a maximum of 45,000 square feet of medical clinic development. These uses would be developed within seven Development Sites (referred to as Development Sites A, B, C, D, E, F, and G) within the HSC.

As discussed further below, the Applicant proposes to modify the Original Project to provide for student housing and hotel uses. Specifically, as part of the modifications, the Applicant would expand the uses within Development Site E to include graduate student

[1] *All references to square feet refer to square feet of floor area as defined in Los Angeles Municipal Code Section 12.03.*

housing uses comprising approximately 238,500 square feet and providing 185 dwelling units and a childcare center. A hotel providing up to 275 rooms and comprising approximately 250,000 square feet may also be constructed within Development Site E adjacent to the proposed graduate student housing uses. In addition, a modification to the maximum amount of square footage evaluated in the Certified EIR is proposed. Specifically, as provided by the Certified EIR, flexibility in the amount of floor area to be developed within the Development Sites would be provided so long as the peak-hour vehicle trips associated with such development do not exceed the peak-hour vehicle trips set forth in the Certified EIR. Under the Modified Project, academic/medical research and medical clinic uses would continue to be permitted within the Project Site. The Modified Project also proposes to improve the existing pedestrian and aesthetic environment along San Pablo Street, Alcazar Street, Eastlake Avenue, Norfolk Street, Biggy Street, Playground Street, and Zonal Avenue between San Pablo Street and Biggy Street. Implementation of the proposed pedestrian enhancement and aesthetic improvements would include modified roadway classifications to allow for narrowing of streets while maintaining traffic lanes and capacity along most roadway segments,[2] widening sidewalks, planting of additional street trees, improving pedestrian lighting, installing street furniture, improving the streetscape with enhanced paving in intersections and decorative banding in sidewalks, and placement of a monument sign at the northwest and southwest corners of Alcazar Street and Soto Street. It is anticipated that the installation of monument signage within the northwest corner of Soto Street and Alcazar Street would include a monument arch, decorative wrought iron fence with integral brick columns, brick pavers with concrete bands, and landscaping and irrigation. Additionally, the southwest corner may include monument signage with a decorative wrought iron fence with integral brick columns, brick pavers with concrete bands, and landscaping and irrigation. To accommodate these improvements, on-street parking would be removed along portions of the affected roadway segments. The specific design details associated with the proposed pedestrian improvements related to roadway striping, crosswalks, turning radii, and installation of traffic control devices would be subject to review and approval by the Los Angeles Department of Transportation's design staff as part of the Bureau of Engineering's B-permit process.

Following implementation of the Modified Project, the HSC would continue to operate as a single, functionally integrated campus. With implementation of the proposed pedestrian enhancements and aesthetic improvements, the Modified Project would

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[2] *As shown in Table 13 of the Traffic Memorandum provided as Appendix D, the existing number of lanes would be maintained along most roadway segments, with the exception of the roadway segment at Alcazar Street from San Pablo Street to Playground Street, which would include an additional eastbound traffic lane. Also shown in Table 13 of the Traffic Memorandum, roadway capacities would generally be maintained or increased with the exception of the roadway segment at San Pablo Street from Alcazar Street to Eastlake Avenue/Norfolk Street, which would be reduced due to the removal of the center turn lane separating the northbound and southbound lanes.*

promote walkability, increase outdoor space, improve connections within the HSC, improve vehicular circulation around the campus, and enhance linkages between the adjacent Lincoln Park and Hazard Park.

The seven Development Sites described above as well as the roadways proposed to be improved are hereafter collectively referred to as the "Project Site."

II. CEQA Authority for an Addendum

As indicated above, this document is an Addendum to the Certified EIR and addresses the proposed changes to the HSC Project set forth in the Certified EIR. The Certified EIR included all statutory sections required by CEQA, comments received on the Draft EIR, responses to comments on the Draft EIR, and supporting technical appendices. CEQA establishes the type of environmental documentation required when changes to a project occur after an EIR is certified. Specifically, Section 15164(a) of the CEQA Guidelines states that:

> *"The lead agency or responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred."*

Section 15162 of the CEQA Guidelines requires a Subsequent EIR when an MND has already been adopted or an EIR has been certified and one or more of the following circumstances exist:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

2. Substantial changes occur with respect to the circumstances under which the project is undertaken, which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:

a. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;

c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Likewise, California Public Resources Code (PRC) Section 21166 states that unless one or more of the following events occur, no subsequent or supplemental environmental impact report shall be required by the lead agency or by any responsible agency:

- Substantial changes are proposed in the project which will require major revisions of the environmental impact report;

- Substantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions in the environmental impact report; or

- New information, which was not known and could not have been known at the time the environmental impact report was certified as complete, becomes available.

As demonstrated by the analysis herein, the Modified Project would not result in any additional significant impacts, nor would it substantially increase the severity of previously anticipated significant impacts. Rather, all of the impacts associated with the Modified Project are within the envelope of impacts addressed in the Certified EIR and do not constitute a new or substantially increased significant impact. Based on this determination, the Modified Project does not meet the requirements for preparation of a Subsequent EIR pursuant to Section 15162 of the CEQA Guidelines.

III. Project Description

A. Original Project

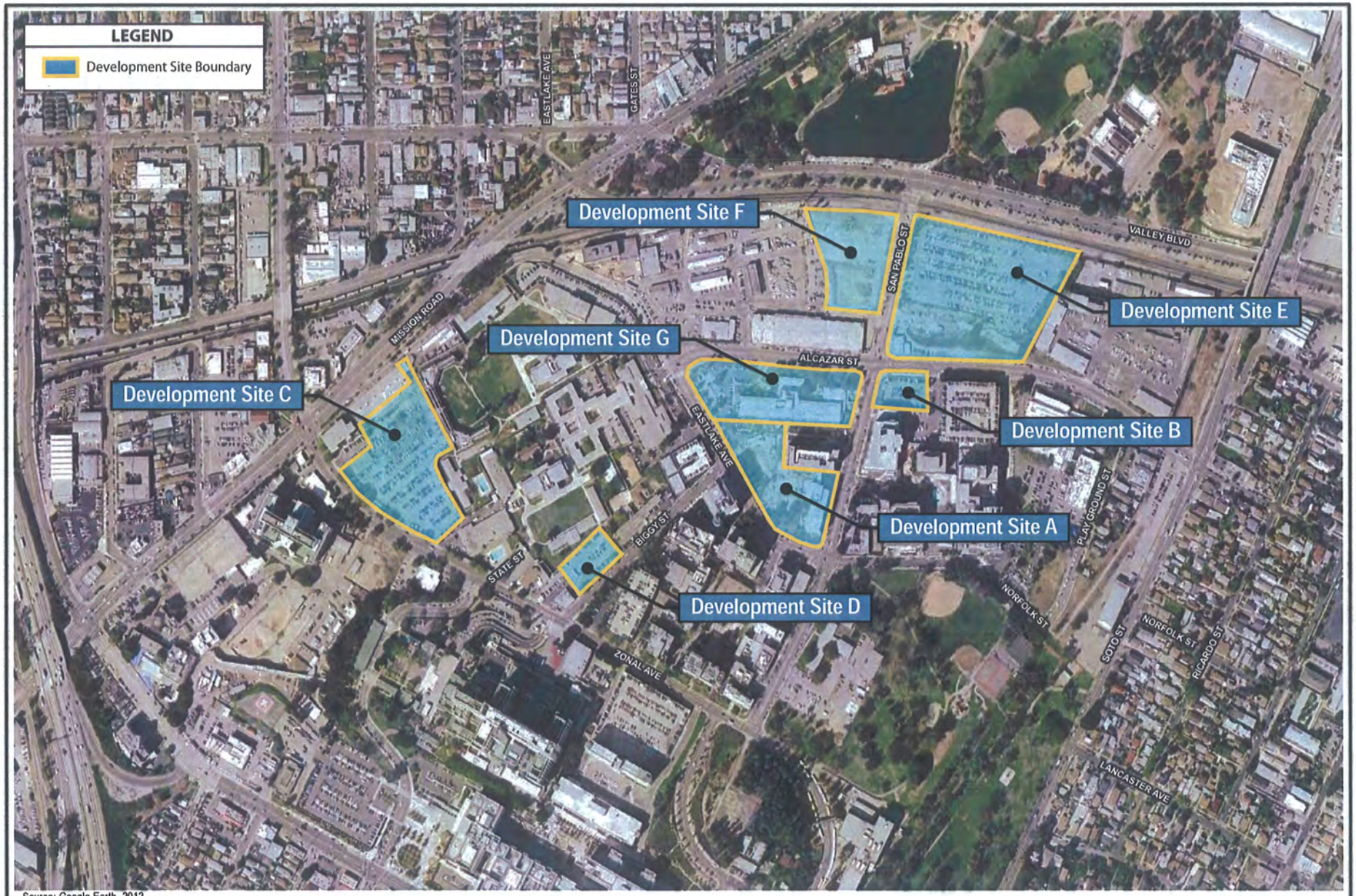
As indicated above, the Original Project provides for the development of between 585,000 and 765,000 square feet of additional academic and medical-related floor area within the existing HSC. Specifically, under the Original Project, up to 120,000 square feet of medical clinic uses could be developed with the remainder of the campus developed with up to 465,000 square feet of academic and/or medical research facilities. In addition, in the event on-site development were to reach 765,000 square feet, a maximum of 45,000 square feet of medical clinic development and 720,000 square feet of academic and/or medical research uses could be constructed. As shown in Figure 1 on page 6, these uses would be developed within seven Development Sites (referred to as Development Sites A, B, C, D, E, F, and G) within the HSC. A description of the proposed development evaluated for each of the Development Sites is as follows:

- **Development Site A:** Development Site A includes approximately 2.46 acres within the central portion of the HSC. The maximum amount of development analyzed for Development Site A ranges from 120,000 square feet of medical clinic facilities to 465,000 square feet of academic and/or medical research facilities. Maximum building heights of 150 feet were evaluated within Development Site A.

- **Development Site B:** Development Site B includes approximately 1.13 acres located at the northeast corner of Alcazar Street and San Pablo Street. The maximum amount of development analyzed for Development Site B ranges from 120,000 square feet of medical clinic facilities to 295,338 square feet of academic and/or medical research facilities. Parking facilities may also be provided. Maximum building heights of 150 feet were evaluated within this Development Site.

- **Development Site C:** Development Site C includes approximately 3.68 acres that are currently used as a surface parking lot and located in the western portion of the HSC on the north side of Zonal Avenue, between State Street and Mission Road. Under the Original Project, Development Site C would be developed with a multi-story parking structure providing up to 2,800 parking spaces with a height not to exceed 75 feet.

- **Development Site D:** Development Site D is comprised of approximately 0.77 acre and is currently used as a surface parking lot. Development Site D is located on the west side of Biggy Street between Zonal Avenue and Eastlake Avenue. Under the Original Project, permitted development for Development Site D includes a combination of academic/medical-related uses and parking. If only academic and medical-related uses are constructed, the maximum amount



Source: Google Earth, 2012.

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Figure 1
Aerial View of Development Sites

of development would be limited to 59,000 square feet of medical clinic facilities to up to 200,000 square feet of academic and/or medical research facilities. Maximum building heights of 140 feet were analyzed for Development Site D.

- **Development Site E:** Development Site E consists of approximately 7.64 acres that are currently used for surface parking. Development Site E is located on the east side of San Pablo Street between Alcazar Street and Valley Boulevard. The maximum amount of development for Development Site E under the Original Project would range from 118,000 square feet of medical clinic facilities to 400,000 square feet of academic and/or medical research facilities. Parking facilities may also be provided. Maximum building heights of 100 feet have been evaluated for Development Site E.

- **Development Site F:** Development Site F is comprised of approximately 2.65 acres located on the west side of San Pablo Street. The maximum amount of development for Development Site F under the Original Project would range from approximately 118,000 square feet of medical clinic facilities to 400,000 square feet of academic and/or medical research facilities. Parking facilities may also be developed. Maximum building heights of 100 feet for this Development Site were analyzed in the Certified EIR.

- **Development Site G:** Development Site G is comprised of approximately 4.0 acres of a larger 8.06-acre parcel. The maximum development approved ranges from approximately 29,500 square feet of medical clinic facilities to 100,000 square feet of academic and/or medical research facilities. Maximum building heights of 100 feet were evaluated for Development Site G.

The Original Project also included the creation of new exterior courtyards and walkways between and around the proposed buildings. These spaces included plantings that would complement the existing landscaping program throughout the HSC. The proposed buildings also featured signage and lighting consistent with existing HSC lighting and signage. Additionally, parking for the Original Project was proposed to be provided within Development Sites C and/or B, D, E, and F. Moreover, the Original Project proposed to connect sidewalks and pedestrian walkways between buildings to the parking with the proposed and existing buildings within the HSC, as well as via the on-campus shuttle program. In addition, drop-off and delivery areas were included at each of the proposed buildings.

B. USC Health Sciences Campus Projects Constructed and Underway

Since preparation of the EIR, the new 62,500-square-foot Eli and Edythe Broad CIRM Center for Regenerative Medicine and Stem Cell Research (Broad Center) has been constructed and is currently in operation. This new facility is located within Development

Site A. In addition, the Healthcare Consultation Center Three (HCC III), which includes development of 92,700 square feet of medical clinic uses and 9,900 square feet of non-clinical uses, is currently in the site plan review approval process with the City of Los Angeles. This facility will be located within Development Site B. The analysis of the potential physical effects of the Modified Project provided below also accounts for the potential physical effects associated with the Broad Center and HCC III.

Other improvement projects currently underway within the HSC include the Los Angeles Department of Water and Power Utilities Project; the Norfolk Street extension; and modifications to the in-patient and out-patient circulation system. These projects are not a part of the Modified Project and are being or will be undertaken regardless of whether the Modified Project proceeds. However, they are described here as they are currently anticipated to be completed and in operation at buildout of the Modified Project. In addition, as described further below, while the physical improvements associated with the Norfolk Street extension would not be implemented as part of the Modified Project, the proposed reclassification of Norfolk Street would be included as part of the Modified Project's request for a general plan amendment.

In conjunction with the Los Angeles Department of Water and Power, USC has proposed to move all communication and energy transmission lines below ground throughout the HSC Campus. With the proposed Norfolk Street extension, Norfolk Street will be extended from its current eastern terminus at Playground Street to a new intersection with Soto Street. This will provide an additional major access point to the HSC and will be designated as the primary entrance for hospital in-patient visitors. In addition, as part of the modifications to the in-patient and out-patient circulation, in-patient and out-patient access would be separated, with in-patient access located on Norfolk Street and the out-patient drop-off areas located off of Alcazar Street. With this separation of in-patient and out-patient circulation, use of San Pablo Street between Alcazar Street and Eastlake Avenue/Norfolk Street as an access point would be reduced.

C. Modified Project

The Applicant proposes to modify the Original Project to provide for student housing and hotel uses to support the University. In addition, a modification to the maximum amount of square footage evaluated in the Certified EIR is proposed. Specifically, as provided in the Certified EIR, flexibility in the amount and type of floor area to be developed within the Development Sites would be provided so long as the peak-hour vehicle trips do not exceed the peak-hour vehicle trips set forth in the Certified EIR. Additionally, the Modified Project proposes pedestrian enhancements and aesthetic improvements within and surrounding the HSC.

Four development options illustrating how the proposed flexibility of uses may be implemented are described further below. A more detailed description of the Modified Project is also provided below.

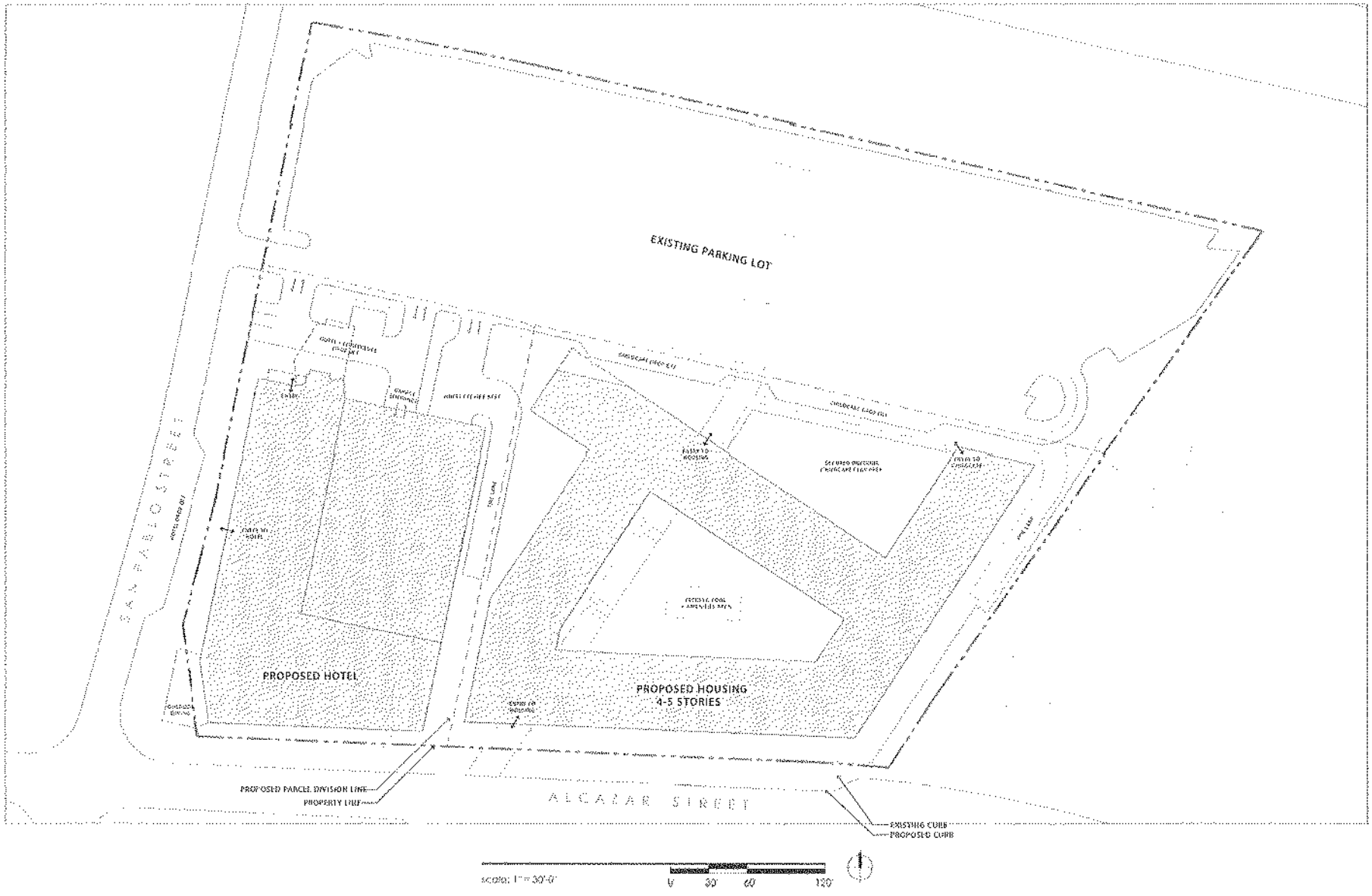
1. Student Housing Component

The Applicant proposes to expand the uses within Development Site E to include graduate student housing uses comprising approximately 238,500 square feet and providing 185 dwelling units, associated amenities, and a childcare center. It is anticipated that the 185 dwelling units would comprise approximately 219,500 square feet of floor area, while the amenities and childcare uses would comprise approximately 7,500 and 11,500 square feet of floor area, respectively. The approximately 7,500 square feet of amenities would include a social lounge, fitness center, business center with study rooms, and an on-site management and leasing office. The childcare center is anticipated to accommodate 100 to 150 children and would only be open to students/employees/affiliates of the HSC.

The new student housing building would be comprised of four to five stories with a maximum building height of approximately 67 feet. As shown in the conceptual site plan provided in Figure 2 on page 10, open space amenities including a new swimming pool and landscaped open space areas would form the central portion of the student housing site. Outdoor landscaped open space areas would also be located adjacent to the childcare use to the north of the childcare uses within the northern portion of the student housing site. In addition, landscaped pedestrian walkways would be provided throughout the student housing site. Construction of the student housing component is expected to commence in January 2013 and be completed in August 2014.

2. Potential Hotel Component

A hotel providing up to 275 rooms may also be constructed within Development Site E to the west of the proposed graduate student housing uses. The proposed hotel would comprise approximately 250,000 square feet and would include approximately 40,000 square feet of amenities (e.g., fitness center, business center), approximately 30,000 square feet of conference center area, approximately 5,000 square feet of ancillary restaurant uses, and approximately 1,000 square feet of ancillary retail uses. In addition, the hotel tower would be up to approximately 175 feet in height, which would be greater than the 100-foot building height set forth in the Original Project for this Development Site, but generally consistent with the taller building heights in the project vicinity. Construction of the hotel component could commence as early as January 2014, with construction completed as early as March 2016.



Source: Ayers Saint Gross Architects & Planners and KTGY Architecture & Planning, February 2012.

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Figure 2
Proposed Site Plan -
Graduate Student Housing and Hotel

3. Academic/Medical Research and Medical Clinic Uses

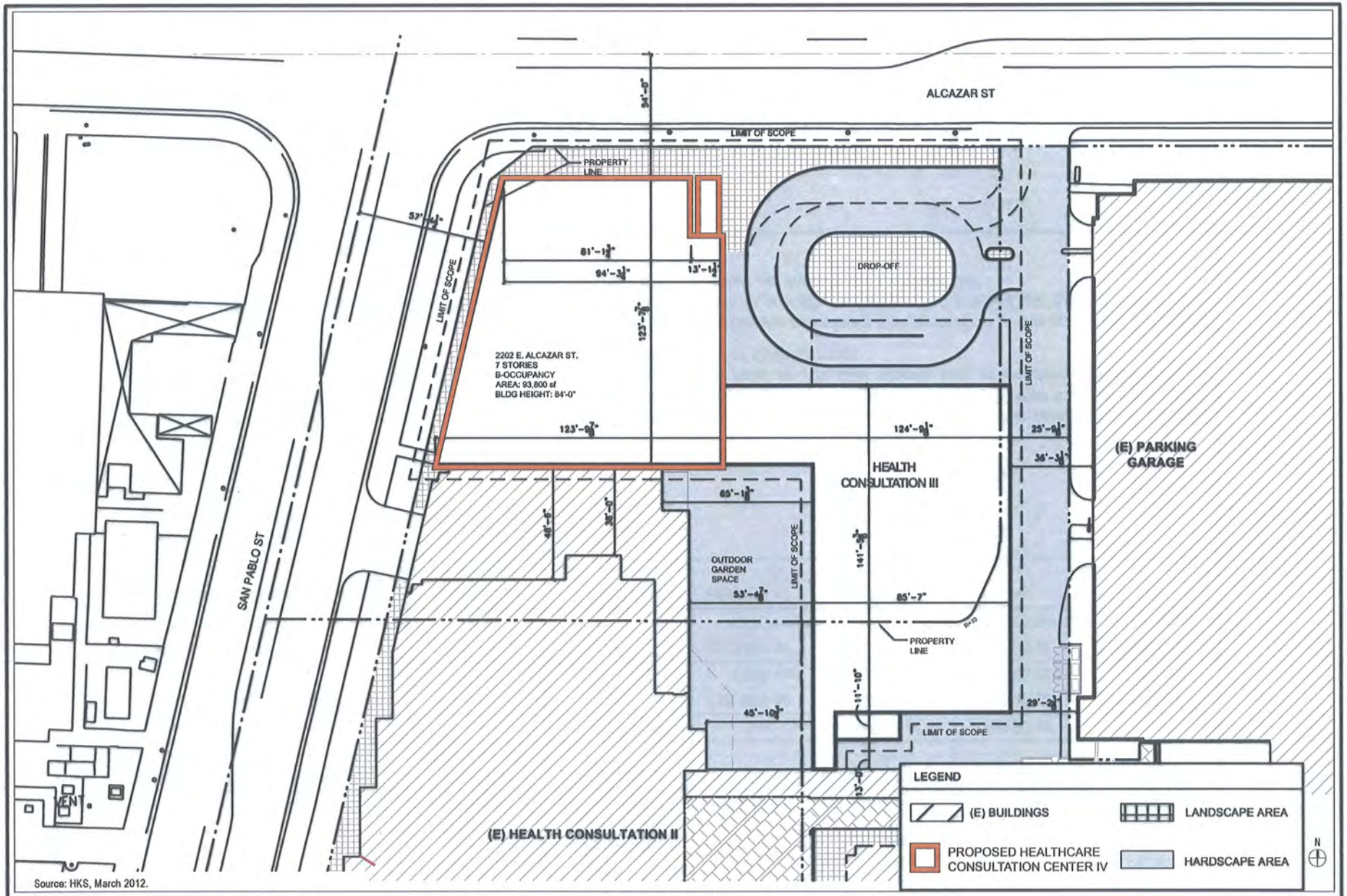
Under the Modified Project, academic/medical research and medical clinic uses would continue to be developed, consistent with the Original Project. Specifically, a seven-story, approximately 84-foot-high HCC IV building is anticipated to be constructed within Development Site B. Based on the development option ultimately chosen, this new building may include up to 99,800 square feet of medical clinic uses only or up to 96,800 square feet of medical clinic uses and up to 9,900 square feet of non-clinical uses. Construction of HCC IV could commence as early as May 2013 with construction completed as early as January 2015. A conceptual site plan for HCC IV is provided in Figure 3 on page 12.

4. Development Options

As described above, the Applicant proposes to add student housing and hotel uses to the uses within HSC. Table 1 on page 13 provides four concepts or options that illustrate how these uses may be integrated with the medical research/academic and medical clinic uses set forth under the Original Project. Under the Modified Project, various mixes of the student housing, hotel, academic/medical research and medical clinic uses would be permitted as long as the peak-hour trips do not exceed the number of trips set forth in the Certified EIR. Four development options illustrating how these land uses may be integrated are provided below. All of these development options would generate similar amounts of peak-hour trips.

(a) Option 1

As shown in Table 1 on page 13, Option 1 would include development of approximately 27,300 square feet of additional medical clinic uses within a new healthcare consultation center (HCC IV) within Development Site B. In addition, within Development Site E, Option 1 proposes development of graduate student housing uses comprising approximately 238,500 square feet and providing 185 dwelling units, approximately 7,500 square feet of amenities, and an approximately 11,560-square-foot childcare center. Option 1 also includes development of hotel uses comprising approximately 250,000 square feet and providing 275 rooms, approximately 40,000 square feet of hotel amenities, a 30,000 square foot conference center, a 5,000-square-foot restaurant, and 1,000 square feet of retail uses. As previously described, the hotel may be developed adjacent to the proposed graduate student housing uses within Development Site E. Lastly, Option 1 also proposes development of approximately 256,000 square feet of additional medical research uses within one of the Development Sites as set forth under the Original Project. Heights of proposed structures would range from approximately 67 feet to 175 feet.



Source: HKS, March 2012.

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Figure 3
Proposed Site Plan -
Healthcare Consultation Center IV

Table 1
Modified Project Development Program Options

Land Use	Original Project	Projects Constructed and Underway	Modified Project Land Use Options[b]			
			Option 1	Option 2	Option 3	Option 4
Medical Clinic Facilities	45,000 to 120,000 sf[a]	92,700 sf	27,300 sf	92,700 sf	96,800 sf	99,800 sf
Non-Clinical Facilities	—	9,900 sf	—	9,900 sf	9,900 sf	—
Graduate Student Housing	—	—	238,500 sf (185 du)	238,500 sf (185 du)	238,500 sf (185 du)	238,500 sf (185 du)
Hotel	—	—	250,000 sf (275 rm)	—	250,000 sf (275 rm)	250,000 sf (275 rm)
Academic/Medical Research	465,000 to 720,000 sf[a]	62,500 sf	256,000 sf	144,000 sf	—	—

sf = square feet

du = dwelling units

rm = rooms

[a] *Under the Original Project, up to 120,000 square feet of medical clinic uses could be developed with the remainder of the HSC developed with up to 465,000 square feet of academic and/or medical research facilities. In the event that medical clinic uses, which are more trip-intensive, is limited to 45,000 square feet, a total of 720,000 square feet of academic and/or medical research uses could be developed, for a total of 765,000 square feet of development.*

[b] *These represent a range of options that could be accommodated within the remaining trip generation of the approved 2005 EIR. It is noted that as part of the Modified Project, the Applicant proposes to provide flexibility in the amount and type of floor area to be developed, so long as the peak-hour vehicle trips do not exceed that set forth in the Certified EIR.*

Source: Gibson Transportation, Matrix Environmental, 2013.

(b) Option 2

Similar to Option 1, Option 2 would include additional medical clinic uses within a new HCC IV. However, Option 2 proposes substantially more square footage of medical clinic uses (approximately 92,700 square feet) and also includes non-clinical uses (approximately 9,900 square feet) within the new HCC IV. However, no hotel uses would be developed as part of Option 2. In addition, as with Option 1, Option 2 would include the graduate student housing component (approximately 185 units and associated amenities, as well as a childcare component). Finally, Option 2 would provide approximately 144,000 square feet of additional medical research uses within one of the seven Development Sites.

(c) Option 3

Option 3 proposes approximately 96,800 square feet of additional medical clinic uses and approximately 9,900 square feet of non-clinical uses within a new HCC IV. Similar to both Options 1 and 2, Option 3 would also include the graduate student housing component with approximately 185 dwelling units and associated amenities, as well as a childcare component. Also similar to Option 1, this Option proposes the 275-room hotel component as described under Option 1. Additional medical research uses within one of the seven Development Sites would not be provided under Option 3.

(d) Option 4

Option 4 proposes approximately 99,800 square feet of additional medical clinic uses within HCC IV. However, no new non-clinical uses would be provided within HCC IV. In addition, Option 4 would also include the graduate student housing component as described above. Also similar to Option 1, this Option proposes the 275-room hotel component as described under Option 1. Additional medical research uses within one of the seven Development Sites would not be provided under Option 4.

5. Features Common to all Development Options

In order to minimize potential conflicts between construction activity and through traffic, the Modified Project would include the development of a Construction Management Plan for use during construction. Features of the Construction Management Plan may include, but would not be limited to: limiting potential lane closures to off-peak travel periods, to the extent feasible; maintaining existing access for adjacent uses; prohibiting parking by construction workers on adjacent streets and directing construction workers to utilize on-site or other HSC-designated parking areas; scheduling receipt of construction materials during non-peak travel periods, to the extent feasible; and complying with approved construction traffic control plans that identify traffic control measures, signs,

delineators, etc., to be implemented by the construction contractor throughout the duration of construction.

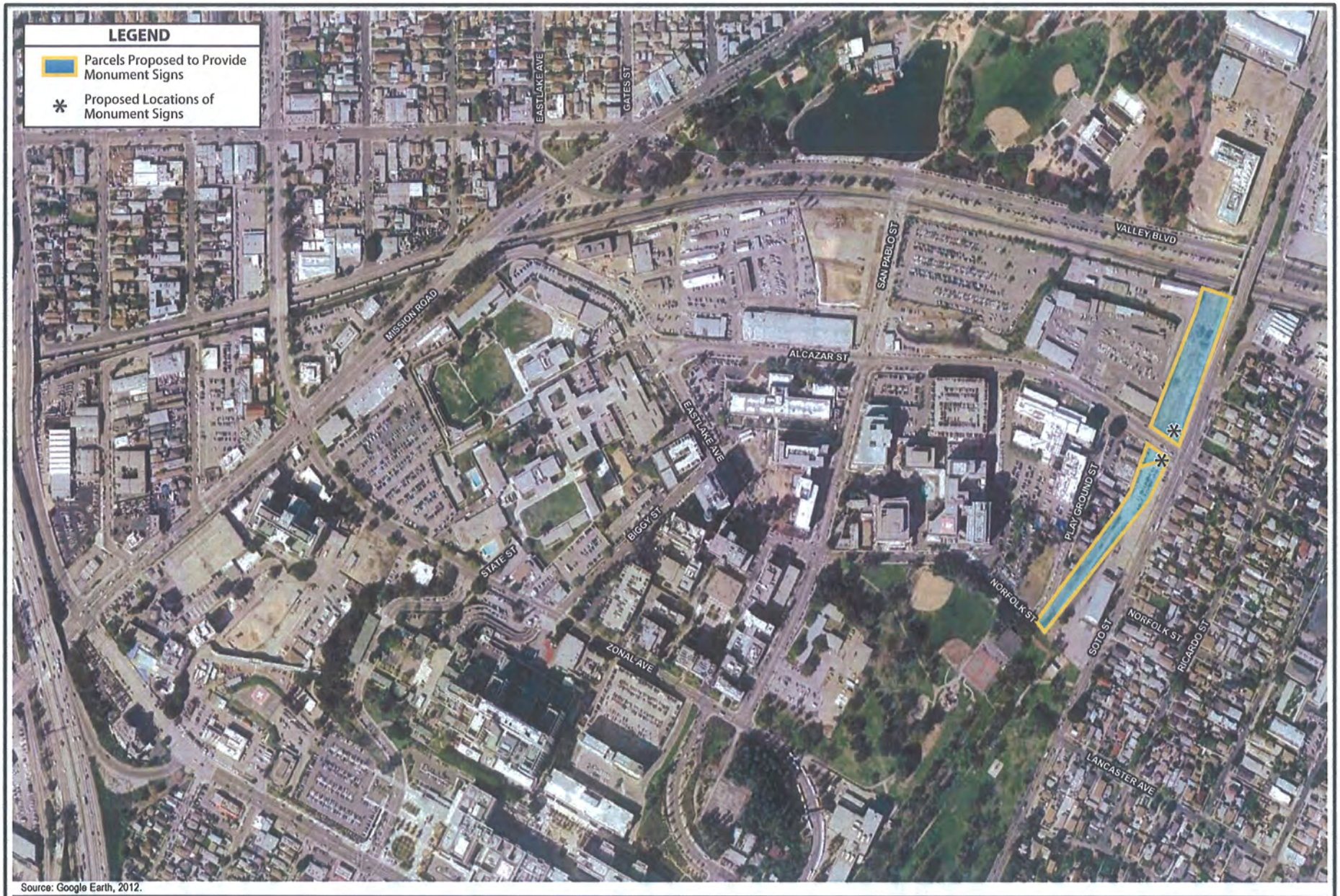
Additionally, similar to the Original Project, the Modified Project would be designed to be compatible with the existing buildings within and surrounding the HSC. In addition, similar to the Original Project, the Modified Project would provide new landscaped walkways between and around the proposed buildings. Proposed signage would include monument signs, building identification signs, directional signage, and wall signs on the buildings' street fronting façades. Signage would be consistent with the signage regulations as provided in the City of Los Angeles Municipal Code and would be visually integrated with the proposed and existing development to employ a consistent design theme. The Modified Project would also include exterior lighting on buildings for security and entryway lighting, within the parking facilities, and along driveways and roadways for safety. In addition, low-level lighting to accent architectural, signage, and landscaping elements may be incorporated throughout the site. Pedestrian-oriented light posts would also be located along pedestrian pathways and along the street frontages. All new street and pedestrian lighting within the public right-of-way would comply with applicable City regulations and would be approved by the Bureau of Street Lighting. The Modified Project would also comply with the standards of the Los Angeles Green Building Code for achieving water efficiency and conservation; material conservation and resource efficiency; and environmental quality.

Access to the graduate student housing and hotel uses is planned to be provided via San Pablo Street and shared with the driveway of the existing surface parking lot. In addition, access to the proposed HCC IV is planned to be provided via driveways along Alcazar Street. Parking for the Modified Project would be provided within one of the existing surface parking lots or parking structures located within the HSC.

6. Proposed Streetscape Improvements and Monument Signs

As previously noted, pedestrian enhancements and aesthetic improvements are proposed along San Pablo Street, Alcazar Street, Playground Street, Eastlake Avenue, Norfolk Street, Biggy Street, and Zonal Avenue between San Pablo Street and Biggy Street. Additional pedestrian and aesthetic improvements, including the installation of monument signs, are also proposed within one parcel located northwest and two parcels located southwest of Alcazar Street and Soto Street, as shown in Figure 4 on page 16.

Improvements would include narrowing of roadways while maintaining traffic lanes and capacity; widening of sidewalks; planting of new landscaping and installation of improved pedestrian lighting and street furniture; the addition of enhanced paving in intersections and decorative banding in sidewalks to enhance the streetscape; and placement of monument signs at the northwest and southwest corners of Alcazar Street



Source: Google Earth, 2012.

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Figure 4
Parcels Proposed to Provide Monument Signs

and Soto Street. It is anticipated that the installation of monument signage within the northwest corner of Soto Street and Alcazar Street would include a monument arch, decorative wrought iron fence with integral brick columns, brick pavers with concrete bands, and landscaping and irrigation. Additionally, the southwest corner may include a monument sign with a decorative wrought iron fence with integral brick columns, brick pavers with concrete bands, and landscaping and irrigation. To accommodate these improvements, on-street parking would be removed along portions of the affected roadway segments.

These improvements would reduce the potential for pedestrian/vehicular conflicts and enhance pedestrian safety and connectivity by narrowing intersections to the minimum required by traffic demands and providing curb extensions in place of turn lanes that favor the vehicle. Specifically, the Modified Project would narrow portions of the roadway along San Pablo Street, Alcazar Street, and Eastlake Avenue in order to provide widened pedestrian sidewalks, improved landscaping, and streetscape enhancements. To allow for these improvements, the current roadway classifications would be modified to reflect the proposed enhancements and facilitate an orderly traffic circulation pattern throughout the HSC. Specifically, San Pablo Street would be reclassified from a secondary highway to a modified collector street along most of the roadway segment and from a secondary highway to a modified local street between Alcazar Street and Eastlake Avenue/Norfolk Street. Additionally, Alcazar Street and Eastlake Avenue would be reclassified from collector streets to modified collector streets, and Norfolk Street would be reclassified from a paper street/local street to a modified collector street.[3] Biggy Street and Playground Street would be reclassified from local streets to modified local streets. No changes would occur to the roadway classification and roadway width of Zonal Avenue would occur.

As part of the Project design, all street crossings would be differentiated from the asphalt roadway and appropriate signalization would be incorporated. In addition, pedestrian lights, placed between existing and proposed street trees along the right-of-way, would reinforce the streetscape hierarchy and identity of the HSC. Benches paired with trash and recycling receptacles, would be integrated in locations of pedestrian flow and congregation so as to promote a sense of community on campus while beginning to establish locations of opportunity for public gathering spaces. Bike racks located in close proximity to building entrances would provide the campus community with a healthy

[3] *It should be noted that the University has proposed to extend Norfolk Street from its current terminus at Playground Street to Soto Street, resulting in a new signalized intersection with Soto Street. The proposed Norfolk Street extension, which is part of the City's Master Plan of Highways, is currently in the site plan review process with the City. While the physical improvements associated with the Norfolk Street extension would not be implemented as part of the Modified Project, the proposed reclassification of Norfolk Street (including the new segment from Playground Street to Soto Street) from a paper street/local street to a modified collector street would be included as part of the Modified Project's request for a general plan amendment.*

alternative to commuting to and from the campus. In addition, due to the length of some blocks and the desire to increase connectivity across the major vehicular corridors within the campus, midblock pedestrian crossings are also anticipated. Additionally, where on-street parking occurs, planted bulb-outs would be incorporated to protect the pedestrian, and narrow the crossing distance. Where on-street parking is eliminated in favor of a wider sidewalk, a traditional pedestrian curb cut would be employed. The specific design details related to roadway striping, crosswalks, turning radii, and installation of traffic control devices would be subject to review and approval by the Los Angeles Department of Transportation's design staff as part of the Bureau of Engineering's B-permit process.

Access to the overall HSC would continue to be provided along Zonal Avenue at Mission Avenue, Eastlake Avenue at Mission Road, San Pablo Street at Valley Boulevard, San Pablo Street at Zonal Avenue, and Alcazar Street at Soto Street. In addition, metered curbside parking would continue to be provided along the east side of San Pablo Street between Norfolk Street and Zonal Avenue; the northern side of Alcazar Street between Soto Street and Eastlake Avenue and on the southern side of Alcazar Street between Eastlake Avenue and San Pablo Street; the southern side of Norfolk Street adjacent to Hazard Park; the southwestern side of Eastlake Avenue between Biggy Street and Alcazar Street; and along the west side of Biggy Street.

Construction of these improvements is anticipated to occur as a phased development with anticipated buildout in 2015.

IV. Required Approvals

The following discretionary actions are proposed to implement the Modified Project:

- General Plan Amendment from Limited Industrial to General Commercial or Neighborhood Commercial for Development Site E;
- General Plan Amendment to the Northeast Los Angeles Community Plan and the Transportation Element of the City of Los Angeles General Plan for reclassification of San Pablo Street, Alcazar Street, Eastlake Avenue, Norfolk Street, Biggy Street, and Playground Street;
- General Plan Amendment to change the land use designation on two parcels located southwest and one parcel located northwest of Alcazar Street and Soto Street from Public Facilities to General Commercial;[4]
- Zone Change from CM-1 and [T][Q]CM-1 to [T][Q]C2-2 for Development Site E;

[4] *This General Plan Amendment is proposed to accurately reflect private ownership and to allow for the installation of monument signage within these parcels.*

- Zone Change for two parcels located southwest and one parcel located northwest of Alcazar Street and Soto Street from PF-1 to [Q]C2-1;[5]
- Subdivision approval (parcel map or lot line adjustment) to create separate legal parcels for the hotel and student housing projects;
- Conditional Use Permit for alcohol service in the hotel;
- Site Plan Review for the various components pursuant to LAMC Section 16.05.C;
- Haul Route Permit;
- Grading, excavation, and building permits; and
- Any other permits or approvals as may be required.

Maps illustrating the existing and proposed land use designations and zoning for the Development Sites are provided further below in Subsection V.I, Land Use.

V. Comparative Analysis of Modified Project Impacts

The analyses provided below address each of the environmental issues analyzed in the Certified EIR and focus on the potential changes in environmental impacts due to the Modified Project. The analysis of each environmental issue first summarizes the findings of the Certified EIR, and then analyzes the potential physical effects of the Modified Project. It should be noted that for conservative purposes, the analyses of impacts associated with the Modified Project provided below consider the potential impacts of Option 1 shown in Table 1 on page 13 as this option would result in the greatest potential for environmental impacts. The analyses provided below also account for the physical environmental effects associated with the Broad Center and HCC III. These impacts attributable to the Modified Project (including the Broad Center and HCC III) are then compared with the analysis and findings within the Certified EIR to determine if such impacts are within the envelope of impacts documented in the Certified EIR. Any changes to the mitigation measures of the Original Project are also provided where necessary for each of the issue areas addressed in the Certified EIR.

[5] *This Zone Change is proposed to accurately reflect private ownership of these parcels and to allow for the installation of monument signage within these parcels. The proposed Q condition would prohibit further development within these parcels without a plan approval and, if required, further CEQA review.*

A. Visual Resources

1. Original Project Impacts

(a) Construction

Construction of the Original Project would involve the demolition and removal of six surface parking lots and one vacant lot within the existing HSC. All of the existing ornamental trees and landscaping on those lots and street trees would be removed to allow for the construction of the Original Project. The removal of street trees would detract from the visual character of the area and would create a temporary potentially significant aesthetic impact. In addition, construction fencing along streets and sidewalks would potentially serve as a target for graffiti, if not appropriately monitored, and could further temporarily degrade the visual character of the area. However, the Original Project would provide for landscape plantings and trees along the perimeter of each Development Site, which would result in an improvement over existing conditions. In addition, all street trees removed would be replaced in accordance with standard City requirements. Furthermore, the Applicant would contract with a graffiti removal company and would monitor each construction site. As set forth in the Certified EIR, with implementation of Mitigation Measure B-1 provided below, visual impacts associated with construction of the Original Project would be less than significant.

(b) Operation

The aesthetic character of the HSC is that of a contemporary and integrated campus set into an existing urban landscape providing academic, research, hospital and medical office buildings, and parking facilities designed in a modernist style. The surface parking lots that are designated for development currently feature limited landscaping consisting of ornamental trees and landscaping designed as amenities to the streetscape. The existing visual resources that contribute to the aesthetic character of the area include the existing USC Health Sciences Campus buildings and the Los Angeles County–USC Medical Center, which display high-quality architecture and landscaping.

Although the Original Project would substantially change the current appearance of the seven Development Sites when viewed from within the HSC and from the streets immediately adjacent to the Development Sites, the existing vacant and surface parking lots proposed for development feature minimal landscaping and offer limited aesthetic value to the area. It is expected that the buildings that would be developed under the Original Project would be designed in a style reflective of the existing academic, research and medical office buildings that define the aesthetic appearance of the HSC. In addition, the maximum heights proposed under the Original Project of 150 feet within Development Sites A and B; 75 feet within Development Site C; 140 feet within Development Site D; and 100 feet within Development Sites E, F, and G, would be comparable to the existing HSC

buildings. Furthermore, the Original Project would incorporate numerous pedestrian-oriented design features including sidewalks, exterior courtyards and pedestrian walkways. Therefore, the Original Project would enhance the visual character of the area and would not substantially contrast with, degrade or eliminate the existing visual character of the area. In addition, shadows cast by the proposed structures during the spring, summer, fall, and winter months would not extend onto any of the shadow-sensitive uses in the vicinity of the seven Development Sites longer than three hours between the hours of 9:00 A.M. and 3:00 P.M. between late October and early April, or for more than four hours between the hours of 9:00 A.M. and 5:00 P.M. between early April and late October. Furthermore, exterior signage for the proposed buildings would be compatible with the design of the existing signage within the HSC and would comply with the regulations of the City of Los Angeles Municipal Code (LAMC) with regard to the placement, construction and modification of all exterior signs and sign support structures. As such, impacts associated with visual quality and light and glare during Original Project operations would be less than significant.

2. Modified Project Impacts

(a) Construction

Similar to the Original Project, visual quality impacts during construction of the Modified Project may result from the temporary creation of construction sites, tree removal, and the potential placement of graffiti on construction barriers. However, as the types of construction activities that would occur under the Modified Project would be generally similar to those anticipated for the Original Project, potential issues associated with construction of the Modified Project would also be the same. In addition, as with the Original Project, the Modified Project would replace any trees in accordance with City standards and would implement the same mitigation measure to address the unauthorized placement of materials on any temporary construction barriers. Therefore, with the implementation of the Original Project's recommended mitigation measure, visual quality impacts during construction of the Modified Project would also be reduced to less than significant levels. Such impacts would be within the envelope of impact analysis addressed in the Certified EIR.

(b) Operation

As with the Original Project, the Modified Project would alter the visual character of the Project Site and surrounding area by replacing existing surface parking lots and infill areas with new structures providing for student housing, hotel, medical clinic, medical research and/or academic uses, and improving the streetscape within the HSC. With respect to visual quality, the Original Project provided for the construction of additional academic and medical-related floor area and parking facilities within the Project Site. Although the Modified Project proposes to expand the uses within Development Site E to

provide for student housing and hotel uses related to the University and potentially provide for more overall square footage, this change is not anticipated to result in additional visual quality impacts as the design of the proposed structures would be compatible with the existing HSC buildings and other surrounding uses. Specifically, similar to the Original Project, the design of the Modified Project would complement the existing HSC in terms of architecture, signage, lighting, landscape, and hardscape. In addition, though the height of the proposed hotel would exceed the 100-foot height anticipated for Development Site E under the Original Project by up to 75 feet, this modification would not result in new view blockages of visual resources as compared to the Original Project. Overall, the heights of the proposed buildings would be compatible with the maximum heights allowed for other Development Sites, including Development Sites A and B (150 feet) and existing multi-story buildings within and surrounding the HSC, such as the Los Angeles County/USC Medical Center Building, which has a building height of up to 247 feet.[6] Therefore, as with the Original Project, the Modified Project would not introduce elements that would substantially detract from the existing visual character or primary visual resources of the area and would not remove or demolish elements that contribute positively to the visual character of the area. Rather, the Modified Project would replace existing surface parking lots, which offer limited aesthetic value to the area, with new contemporary buildings that would serve to enhance the overall appearance of the HSC. In addition, with implementation of the pedestrian enhancements and aesthetic improvements, the new streetscape would enhance the appearance of the campus while promoting walkability. Furthermore, increased outdoor space, improved connections within the HSC and to the surrounding community, and enhanced linkages between Lincoln Park and Hazard Park would also be provided. Additionally, benches paired with trash and recycling receptacles would be integrated in locations of pedestrian flow and congregation so as to promote a sense of community on campus while helping to establish locations of opportunity for public gathering spaces. Moreover, like the Original Project, the Modified Project would implement the mitigation measures set forth below that would assure that the Modified Project would be visually compatible with existing development and would not degrade the visual environment. Thus, as with the Original Project, impacts related to visual quality would be less than significant under the Modified Project. Such impacts would be within the envelope of impacts set forth in the Certified EIR.

3. Mitigation Measures

A Mitigation Monitoring and Reporting Program (MMRP) was adopted for the Original Project. The mitigation measures set forth in the MMRP included in the Certified EIR to address visual quality impacts would also apply to the Modified Project. No additional mitigation measures are required for the development of the Modified Project as no

[6] *Emporis, Building Directory, www.emporis.com/building/losangelescountyuscmedicalcenter-losangeles-ca-usa, accessed March 28, 2012.*

significant aesthetic impacts would result from implementation of the Modified Project. The mitigation measures identified in the Certified EIR include the following:

(a) Construction

Mitigation Measure B-1: The Applicant shall ensure, through appropriate postings and daily visual inspections, that no unauthorized materials are posted on any temporary construction barriers or temporary pedestrian walkways, and that any such temporary barriers and walkways are maintained in a visually attractive manner throughout the construction period.

(b) Operation

Mitigation Measure B-2: Building façades facing public streets shall be designed to enhance the pedestrian experience and connectivity of the HSC campus through such features as wide and well-illuminated entry areas, landscaping, and informal gathering space.

Mitigation Measure B-3: Architectural design and exterior building materials shall be compatible with the theme and quality of building design and materials used within the HSC campus.

Mitigation Measure B-4: New utilities shall be constructed underground, to the extent feasible.

Mitigation Measure B-5: Exterior signage for the proposed buildings shall be compatible with the design of the building.

Mitigation Measure B-6: All new or replacement street trees shall be selected for consistency with the existing street trees or in accordance with a street tree master plan reviewed and approved by the Department of Public Works Street Tree Division.

Mitigation Measure B-7: All mechanical, electrical and rooftop equipment shall be screened from view from adjacent surface streets.

Mitigation Measure B-8: Landscaping and/or vegetation features shall be incorporated into the design of each Development Site.

Mitigation Measure B-9: All exterior lighting shall be directed on-site or shielded to limit light spillover effects.

B. Agriculture Resources

1. Original Project Impacts

No agricultural uses or related operations are present on the Project Site or within the surrounding area, nor is the Project Site considered prime or unique farmland of

statewide or local importance as identified by the State Department of Conservation and the City of Los Angeles General Plan. The Project Site is also not zoned for agricultural uses, nor is it under a Williamson Act contract. Therefore, the Original Project would not result in the conversion of designated farmland, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural uses. As such, under the Original Project, no impacts to agricultural uses would occur, and no mitigation measures are necessary.

2. Modified Project Impacts

There are no existing or mapped agricultural resources within the Project Site and such uses are not proposed as part of the Modified Project. Therefore, similar to the Original Project, the Modified Project would not result in impacts to agricultural resources. Thus, impacts on agricultural resources under the Modified Project would be within the envelope of impacts identified in the Certified EIR.

C. Air Quality and Greenhouse Gas Emissions

1. Original Project Impacts

(a) Construction

Construction-related daily (short-term) emissions are expected to exceed South Coast Air Quality Management District (SCAQMD) significance thresholds for NO_X and ROC.[7] Thus, emissions of these pollutants would result in significant short-term regional air quality impacts. Daily emissions of CO, SO_X, and PM_{10} would be considered adverse, but less than significant, since the levels of these emissions would fall below the SCAQMD significance thresholds.

Potential maximum CO, SO_2 and NO_2 concentrations, when added to background ambient concentrations, would not violate their respective Ambient Air Quality Standards at any of the 16 sensitive receptor locations. However, the Original Project would result in localized PM_{10} concentrations during construction that exceed the SCAQMD's significance threshold at 13 of the 16 sensitive receptor locations. Therefore, construction of the Original Project would result in a significant and unavoidable impact on localized air quality with respect to PM_{10} concentrations.

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[7] *Subsequent to completion of the Certified EIR, SCAQMD changed the pollutant Reactive Organic Compounds (ROC) to Volatile Organic Compounds (VOC). For purposes of this analysis, the two terms are interchangeable.*

The Original Project would not result in a long-term (i.e., 70 years) substantial source of Toxic Air Contaminant emissions, with no residual emissions after construction and corresponding individual cancer risk. In addition, via mandatory compliance with SCAQMD rules, no construction activities or materials are proposed that would create objectionable odors. As such, Project-related toxic emission and odor impacts during construction would be less than significant.

(b) Operations

Regional emissions resulting from the Original Project would not exceed regional SCAQMD thresholds for ROC, SO_X, CO, or PM_{10}. However, the Original Project would exceed the regional SCAQMD threshold for NO_X, and impacts associated with this pollutant would be significant.

The Original Project would not have a significant impact relative to 1-hour or 8-hour local CO concentrations due to mobile source emissions. Since significant impacts would not occur at the intersections with the highest traffic volumes that are located adjacent to sensitive receptors, no significant impacts are anticipated to occur at any other locations in the study area as the conditions yielding CO hotspots would not be worse than those occurring at the analyzed intersections. In addition, the operation of the Original Project's parking structure would not cause or localize air quality impacts related to mobile sources. Furthermore, compliance with SCAQMD rules and regulations regarding stationary-source combustion equipment would ensure that contributions to localized PM_{10} concentrations remain below the SCAQMD significance threshold. As the Original Project does not cause an exceedance of an ambient air quality standard, the Original Project's localized operational air quality impacts would therefore be less than significant.

The potential exists that the later stages of construction could occur concurrently with the occupancy of the earlier stages of development. Concurrent construction and operational emissions would exceed regional SCAQMD daily thresholds for NO_X, and ROC, but would not exceed the regional SCAQMD daily threshold for CO, SO_X, or PM_{10}. Thus, a significant regional air quality impact due to NO_X, and ROC emissions would occur.

Potential sources of air toxics (e.g., truck traffic on local streets, on-site truck idling and movement and operation of transportation refrigeration units) would be dispersed among the Development Sites (i.e., at multiple loading dock, boiler and emergency backup generator locations). In addition, the Original Project would not include any notable sources of acutely and chronically hazardous toxic air contaminants, although minimal emissions may result from the use of consumer products. Furthermore, the Original Project does not include any uses identified by the SCAQMD as being associated with odors. As such, impacts with regard to toxic contaminants and odors from operation of the Original Project would be less than significant.

2. Modified Project Impacts

(a) Construction

Similar to the Original Project, construction of the Modified Project has the potential to create air quality impacts through the use of heavy-duty construction equipment and through vehicle trips generated from construction workers traveling to and from the Project Site. In addition, fugitive dust emissions would result from demolition and construction activities. Mobile source emissions, primarily NO_X, would result from the use of construction equipment such as dozers, loaders, and cranes. During the finishing phase, paving operations and the application of architectural coatings (i.e., paints) and other building materials would release VOCs. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation and, for dust, the prevailing weather conditions. The assessment of construction air quality impacts considers each of these potential sources.

Daily regional emissions during construction were forecasted by assuming a conservative start date (i.e., assuming all construction occurs at the earliest feasible date) and applying the off-road and mobile-source emissions factors derived from the California Air Resources Board's (CARB) OFFROAD2007 and EMFAC2011 models. The emission calculation procedures were conducted consistent with the most recent version of the URBEMIS model (URBEMIS 2007). Details are presented in Appendix A. The calculations reflect the types and quantities of construction equipment that would be used to remove existing structures and pavement; grade and excavate the Project Site; construct the proposed buildings, structures and related improvements; and plant new landscaping within the Project Site. Construction tasks were aggregated to reflect overlapping tasks and identify the maximum construction emissions occurring over the course of Modified Project construction.

In order to provide a conservative analysis, it was assumed that all construction activities would be completed within the minimum timeframe anticipated for construction, which provides for the maximum overlap of construction components within the Modified Project's overall development period as well as the most intense peak daily construction activity for each component of the Modified Project. This is of particular importance as construction emissions are directly related to the duration and intensity of construction activities (i.e., emissions increase as the amount of construction and intensity increases). Emission rates representative of certain stages of construction (i.e., construction worker trips and delivery vehicle trips) would also decrease over time in response to the use of cleaner vehicles or equipment that emit lower levels of pollutants. Detailed construction phasing assumptions are presented in Appendix A.

As shown in Table 2 on page 28, Modified Project emissions of VOC and NO_X would exceed the SCAQMD regional threshold. However, VOC and NO_X emissions would remain below those previously reported under the Original Project. All other pollutants remain below their respective SCAQMD regional thresholds and below the previously reported emissions for the Original Project. As such, the Modified Project would not result in any new or substantially increased significant impacts to regional air quality and such impacts would be within the envelope of impacts set forth in the Certified EIR.

When quantifying mass emissions for localized analysis, only emissions that occur on-site are considered. Consistent with the SCAQMD Localized Significance Threshold (LST) methodology guidelines, emissions related to off-site delivery/haul truck activity and employee trips are not considered in the evaluation of localized impacts. As shown in Table 3 on page 30, localized emissions of CO, PM_{10}, and $PM_{2.5}$ would remain below their respective SCAQMD LST significance thresholds. However, NO_X emissions would exceed the SCAQMD LST. Therefore, the localized effects from the on-site construction emissions of NO_X would be potentially significant and mitigation measures are required.

(b) Operation

Similar to the Original Project, air pollutant emissions associated with occupancy and operation of the Modified Project would be generated by consumption of both electricity and natural gas, and by the operation of on-road vehicles. With the modification to account for student housing and hotel uses, regional emissions were re-evaluated using the most recent version of URBEMIS (URBEMIS 2007). The results of this analysis are shown in Table 4 on page 32.

In comparison to the Original Project, operational emissions for the Modified Project would decrease by 49 lbs/day of CO, 22 lbs/day of NO_X, 1 lb/day of VOC, and results in similar amounts of SO_X. However, the Modified Project is expected to result in an increase of 55 lbs/day of PM_{10} when compared to the Original Project. However, like the Original Project, regional PM_{10} emissions from the Modified Project would be below the applicable significance threshold and the impact from such emissions would be below the applicable significance threshold and the impact from such emissions would be less than significant. The overall reduction in operational emissions of CO, NO_X, and VOC is a result of the reduced emission factors the latest URBEMIS model uses along with a later buildout year.

The increase in PM_{10} emissions is a direct result of additional sources the latest URBEMIS model includes in the emission estimates; specifically, entrained roadway dust from motor vehicle travel on paved roads. Though the Modified Project would result in a reduction in NO_X emissions in comparison to the Original Project, similar to the Original Project, operation of the Modified Project would exceed the SCAQMD regional threshold for NO_X. Implementation of the same project design features and mitigation measures as

Table 2
Modified Project Regional Construction Emissions
(Pounds per Day)

Emission Source	VOC	CO	NO_X	$SO_{2.5}$	PM_{10}	$PM_{2.5}$[a]
Modified Project						
Residential Demolition	5	25	43	<1	10	3
Residential Earthwork	16	74	162	<1	33	12
Residential Foundation	6	33	46	<1	2	2
Residential Concrete/Steel/Frame	7	47	50	<1	2	2
Residential Interior/Exterior Finishing	69	54	38	<1	2	2
Residential Landscape/Paving	3	17	20	<1	1	1
Hotel Demolition	4	18	28	<1	4	1
Hotel Earthwork	10	55	99	<1	21	7
Hotel Foundation	5	28	45	<1	2	1
Hotel Concrete/Steel/Frame	7	41	51	<1	2	2
Hotel Interior/Exterior Finishing	71	50	32	<1	2	1
Hotel Landscape/Paving	3	14	17	<1	1	1
HCCIII Demolition	4	25	31	<1	2	2
HCCIII Earthwork	5	31	39	<1	7	3
HCCIII Shoring	3	17	19	<1	1	1
HCCIII Concrete/Steel/Frame	6	36	40	<1	2	2
HCCIII Interior/Exterior Finishing	24	59	32	<1	2	1
HCCIII Landscape/Paving	3	17	20	<1	1	1
HCCIV Demolition	4	25	31	<1	2	2
HCCIV Earthwork	5	31	39	<1	9	3
HCCIV Shoring	3	17	19	<1	1	1
HCCIV Concrete/Steel/Frame	6	36	40	<1	2	2
HCCIV Interior/Exterior Finishing	24	59	32	<1	2	1
HCCIV Landscape/Paving	3	17	20	<1	1	1
Roadway Improvements[b]						
Phase 3A.1 Demolition	3	14	24	<1	1	1
Phase 3A.2 Grading	3	18	27	<1	5	2
Phase 3A.3 Paving	2	10	14	<1	1	1
Phase 3A.4 Demolition	3	14	24	<1	1	1
Phase 3A.5 Grading	3	18	27	<1	5	2
Phase 3A.6 Paving	2	9	13	<1	1	1
Phase 3B.1 Demolition	3	14	22	<1	1	1
Phase 3B.2 Grading	3	17	25	<1	4	2
Phase 3B.3 Paving	2	9	13	<1	1	1
Phase 3B.4 Demolition	3	14	22	<1	1	1
Phase 3B.5 Grading	3	17	25	<1	4	2
Phase 3B.6 Paving	2	9	12	<1	1	1
Maximum Concurrent Peak Daily[c]	**130**	**236**	**240**	**<1**	**50**	**18**

Table 2 (Continued)
Modified Project Regional Construction Emissions
(Pounds per Day)

Emission Source	VOC	CO	NO_X	$SO_{2.5}$	PM_{10}	$PM_{2.5}$[a]
Comparison to SCAQMD Thresholds						
Modified Project Emissions	130	236	240	<1	50	18
SCAQMD Significance Threshold	75	550	100	150	150	55
Over/(Under)	55	(314)	140	(150)	(100)	(37)
Comparison to Original Project						
Modified Project Emissions	130	236	240	<1	50	18
Original Project Emissions[d]	144	340	281	1	107	—
Over (Under)	**(14)**	**(104)**	**(41)**	**(1)**	**(64)**	—

[a] *Subsequent to completion of the Certified EIR, the SCAQMD promulgated $PM_{2.5}$ regional significance thresholds. As shown above, the Modified Project would result in less than significant regional construction $PM_{2.5}$ impacts.*

[b] *In order to limit potential impacts during construction of the proposed streetscape improvements, construction is proposed to occur in two primary phases, Phases 3A and 3B.*

[c] *Maximum concurrent peak daily emissions of VOC and CO occur when Residential Interior/Exterior Finishing, Hotel Earthwork, HCC III Interior/Exterior Finishing, and HCC IV Interior/Exterior Finishing and Phase 3A.8 Grading phases all overlap. Maximum concurrent peak daily emissions of NO_X, PM_{10}, and $PM_{2.5}$ occur during the Earthwork phases of the Residential element, HCC III, and HCC IV.*

[d] *Table 13 on page 211, Section VI.D, Air Quality, of the Draft EIR.*

Source: Matrix Environmental, 2013.

the Original Project would reduce the potential air quality impacts of the Modified Project to the extent technically feasible. However, emissions would remain above SCAQMD significance thresholds. Therefore, similar to the Original Project, operation of the Modified Project would have a significant and unavoidable impact on regional air quality for NO_X. Operational emissions would not exceed the SCAQMD significance thresholds for VOC, CO, SO_X, PM_{10}, or $PM_{2.5}$, and, thus, impacts are concluded to be less than significant for those pollutants. Such impacts would be within the envelope of impacts included in the Certified EIR.

With regard to traffic-related localized air quality impacts, as described further below in Subsection V.O, Traffic, Circulation, and Parking, the Modified Project would result in a slightly reduced number of peak-hour trips compared to the Original Project. Therefore, traffic-related localized air quality impacts would be essentially the same for the Modified Project as for the Original Project. Since the localized CO hotspot analysis for the Original Project did not result in any significant impacts, the Modified Project would likewise not have any localized impacts.

Table 3
Modified Project Localized Construction Emissions
(Pounds per Day)

Emission Source	CO	NO_X	PM_{10}	$PM_{2.5}$[a]
Modified Project				
Residential Demolition	18	28	9	2
Residential Earthwork	40	72	30	9
Residential Foundation	16	23	1	1
Residential Concrete/Steel/Frame	16	26	1	1
Residential Interior/Exterior Finishing	17	27	2	1
Residential Landscape/Paving	12	17	1	1
Hotel Demolition	14	25	3	1
Hotel Earthwork	29	48	19	6
Hotel Foundation	13	19	1	1
Hotel Concrete/Steel/Frame	15	24	1	1
Hotel Interior/Exterior Finishing	12	18	1	1
Hotel Landscape/Paving	11	15	1	1
HCCIII Demolition	14	27	2	1
HCCIII Earthwork	20	32	7	3
HCCIII Shoring	9	18	1	1
HCCIII Concrete/Steel/Frame	18	30	2	1
HCCIII Interior/Exterior Finishing	12	20	1	1
HCCIII Landscape/Paving	12	17	1	1
HCCIV Demolition	14	27	2	1
HCCIV Earthwork	20	32	9	3
HCCIV Shoring	9	18	1	1
HCCIV Concrete/Steel/Frame	18	30	2	1
HCCIV Interior/Exterior Finishing	12	20	1	1
HCCIV Landscape/Paving	12	17	1	1
Roadway Improvements				
Phase 3A.1 Demolition	10	19	1	1
Phase 3A.2 Grading	14	22	4	2
Phase 3A.3 Paving	7	11	1	1
Phase 3A.4 Demolition	10	19	1	1
Phase 3A.5 Grading	14	22	4	2
Phase 3A.6 Paving	7	10	1	1
Phase 3B.1 Demolition	10	17	1	1
Phase 3B.2 Grading	14	21	4	2
Phase 3B.3 Paving	7	10	1	1
Phase 3B.4 Demolition	10	17	1	1
Phase 3B.5 Grading	14	21	4	2
Phase 3B.6 Paving	7	9	1	1
Maximum Concurrent Peak Daily[b]	**80**	**135**	**46**	**15**

Table 3 (Continued)
Modified Project Localized Construction Emissions
(Pounds per Day)

Emission Source	CO	NO_X	PM_{10}	$PM_{2.5}$[a]
Comparison to SCAQMD LSTs				
Modified Project Emissions	80	135	46	15
SCAQMD Significance Threshold[c]	3,188	68	68	21
Over/(Under)	(3,108)	67	(23)	(6)

[a] *Subsequent to completion of the Certified EIR, the SCAQMD promulgated $PM_{2.5}$ localized significance thresholds. As shown above, the Modified Project would result in less than significant localized construction $PM_{2.5}$ impacts.*

[b] *Maximum concurrent peak daily emissions of CO, NO_X, PM_{10}, and $PM_{2.5}$ occur during the Earthwork phases of the Residential element, HCC III, and HCC IV.*

[c] *SCAQMD LSTs based on SRA 1, 5-acre active site area, and 110-meter receptor distance. The SCAQMD localized threshold for NO_X was revised to account for the recently adopted 1-hour NO_2 NAAQS of 188 $\mu g/m^3$ or an incremental threshold of 46 $\mu g/m^3$ for SRA 1.*

Source: Matrix Environmental, 2013.

The Modified Project would also be subject to the SCAQMD's Air Quality Management Plan (AQMP). A project is consistent with the AQMP if it is consistent with the population, housing, and employment assumptions that were used in its development. The most recent AQMP adopted by the SCAMQD incorporates SCAG's 2008 Regional Transportation Plan (RTP) socioeconomic forecast projections of regional population and employment growth. As discussed below under Section V.L, Population and Housing, the Modified Project would result in an increase of 447 beds. Using the number of beds as a surrogate for population, the Modified Project's increase in population would represent approximately 0.011 percent of the City of Los Angeles Subregion's forecasted population growth for 2014. Additionally, the Modified Project is expected to result in an increase of approximately 343 jobs associated with the proposed hotel uses. This would represent approximately 0.77 percent of the City of Los Angeles Subregion's forecasted employment growth for 2014. Such levels of population and employment growth are consistent with the forecasts for the Subregion as adopted by SCAG. Because the SCAQMD is expected to incorporate these same projections into the AQMP, it can be concluded that the Modified Project would be consistent with the projections in the AQMP. For comparison purposes, the Original Project included an increase of approximately 487 jobs, 144 jobs more than the Modified Project.

When considering potential air quality impacts under CEQA, consideration is given to the location of sensitive receptors within close proximity of land uses that emit toxic air contaminants (TACs). The CARB has published and adopted the "*Air Quality and Land Use Handbook: A Community Health Perspective (2005),*" which provides

Table 4
Modified Project Operation Emissions
(Pounds per Day)

Emission Source	VOC	CO	NO_X	$SO_{2.5}$	PM_{10}	$PM_{2.5}$[a]
Original Project[b]						
Mobile Sources	44	479	59	<1	64	--
Stationary Sources[c]	1	7	42	3	1	--
Miscellaneous Sources	1	10	2	<1	1	--
Total	**46**	**496**	**103**	**3**	**66**	--
Modified Project						
Mobile Sources	38	436	57	<1	120	23
Stationary Sources	<1	3	19	2	1	1
Area Sources	7	8	5	1	<1	<1
Total	**45**	**447**	**81**	**3**	**121**	**24**
Difference (Net) Emissions	(1)	(49)	(22)	0	55	--
Comparison to SCAQMD Threshold						
Modified Project Emissions	45	447	81	3	121	24
SCAQMD Significance Threshold	55	550	55	150	150	55
Over (Under)	(10)	(103)	26	(147)	(29)	(31)

[a] *Subsequent to completion of the Certified EIR, the SCAQMD promulgated $PM_{2.5}$ significance thresholds. As shown above, the Modified Project would result in less than significant $PM_{2.5}$ impacts.*

[b] *Table 14 on page 218, Section VI.D, Air Quality, of the Draft EIR.*

[c] *Stationary sources under the Original Project include electricity and natural gas usage. Under the Modified Project, emissions from natural gas usage are included as an area source.*

Source: Matrix Environmental, 2013.

recommendations regarding the siting of new sensitive land uses near potential sources of air toxic emissions (e.g., freeways, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline dispensing facilities). The SCAQMD adopted similar recommendations in their "*Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning (2005).*" Together the CARB and SCAQMD guidelines recommend siting distances for both the development of sensitive land uses in proximity to TAC sources, and the addition of new TAC sources in proximity to existing sensitive land uses.

Based on CARB siting recommendations, sensitive receptors should not be sited within 1,000 feet of a warehouse distribution center or rail yard (which have extensive heavy-duty truck activity), within 500 feet of a freeway (or similar high traffic roadway (i.e., roads within urbanized areas carrying more than 100,000 vehicles per day), or within

300 feet of a dry cleaning facility that uses perchloroethylene, among other siting recommendations. The residential units included as part of the Modified Project would not be located within the above described distances to any of these sources of TACs. Therefore, the Modified Project would not result in any air toxic impacts and such impacts would be within the envelope of impacts analyzed in the Certified EIR.

(c) Greenhouse Gas Emissions

Until the passage of AB 32, CEQA documents generally did not evaluate GHG emissions or impacts on global climate change. Rather, the primary focus of air pollutant analysis in CEQA documents was the emission of criteria pollutants, or those identified in the California and federal Clean Air Acts as being of most concern to the public and government agencies (e.g., toxic air contaminants). With the passage of AB 32 and SB 97, CEQA documents now contain a more detailed analysis of GHG emissions. However, the analysis of GHGs is different from the analysis of criteria pollutants. Since the half-life of CO_2 is approximately 100 years, GHGs affect the global climate over a relatively long timeframe. Conversely, for criteria pollutants, significance thresholds/impacts are based on daily emissions; and the determination of attainment or non-attainment are based on the daily exceedance of applicable ambient air quality standards (e.g., 1-hour and 8-hour exposures).

In its January 2008, CEQA and Climate Change white paper, the California Air Pollution Control Officers Association (CAPCOA) identified a number of potential approaches for determining the significance of GHG emissions in CEQA documents. In its white paper, the CAPCOA suggests making significance determinations on a case-by-case basis when no significance thresholds have been formally adopted by a lead agency. One of the potential approaches identified in the CAPCOA white paper, Threshold 1.1, would require a project to meet a percent reduction target. This target would be based on the average reduction from "business-as-usual" emissions identified by CARB as necessary to satisfy AB 32's mandate of returning to 1990 levels of GHG emissions by 2020. CARB has calculated the necessary reduction to be approximately 16 percent from "business-as-usual."[8]

Subsequent to the completion of the Original Project's Certified EIR, the state's Office of Planning and Research's recommended amendments to the CEQA Guidelines for GHGs were adopted by the Resources Agency on December 30, 2009. Analysis of GHG emissions in a CEQA document presents unique challenges to lead agencies. However, such analysis must be consistent with existing CEQA principles and, therefore, the amendments comprise relatively modest changes to various portions of the existing CEQA Guidelines. The amendments add no additional substantive requirements; rather, the

[8] *CARB, Supplement to the AB 32 Scoping Plan FED, Table 1.2-2, Updated 2020 Business-as-Usual Emissions Forecast, www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf.*

Guidelines merely assist lead agencies in complying with CEQA's existing requirements. Modifications address those issues where analysis of GHG emissions may differ in some respects from more traditional CEQA analysis. Other modifications clarify existing law that may apply both to an analysis of GHG emissions as well as more traditional CEQA analyses.

As shown in Table 5 on page 35, the Modified Project would result in an annual total of 15,399 metric tons of carbon dioxide equivalent (CO_2e). This would represent an approximate 27 percent reduction over the "business-as-usual" scenario. This reduction is a direct result of applying required conservation measures for new buildings per the City of Los Angeles "Green Building" ordinance. Some key mandatory measures included in the City of Los Angeles "Green Building" ordinance include the following:

- Construction—Construction waste reduction of at least 50 percent;
- Construction—100 percent of trees, stumps, rocks, and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled;
- Transportation Demand—Provide secure bicycle parking for 5 percent of motorized vehicle parking capacity;
- Transportation Demand—Provide designated parking for any combination of low-emitting, fuel-efficient, and carpool/van pool vehicles;
- Energy Conservation—Provide electric vehicle supply wiring for a minimum of 5 percent of the total number of parking spaces;
- Energy Conservation—A project must exceed the CEC requirement based on the 2008 Energy Efficiency Standards by 15 percent using an Alternative Calculation Method (ACM) approved by the CEC;
- Energy Conservation—Each appliance provided and installed shall meet Energy Star if an Energy Star designation is applicable for that appliance;
- Renewable Energy—Provide future access, off-grid pre-wiring, and space for electrical solar systems;
- Water—A schedule of plumbing fixtures and fixture fittings shall be provided that will reduce the overall use of potable water within the building by at least 20 percent, based on the maximum allowable water use per plumbing fixture and fittings as required by the California Building Standards Code; and
- Wastewater—Each building shall reduce wastewater by 20 percent based on the maximum allowable water use per plumbing fixture and fittings as required by the California Building Standards Code.

Table 5
Annual GHG Emissions Summary
(Metric Tons of Carbon Dioxide Equivalent)

Scope	"Business-as-Usual" Project	Project	Project's Break from "Business-as-Usual"
Mobile Source	17,771	12,320	31%
Electricity Usage	1,332	1,154	13%
Natural Gas Usage	2,022	1,747	14%
Water Usage/Wastewater Generation	368	294	20%
Solid Waste	162	162	0%
Construction	201	201	0%
Total	**21,857**	**15,879**	**27%**

Source: Matrix Environmental, 2013.

As such, the Modified Project is expected to result in less than significant impacts related to GHG emissions.

3. Mitigation Measures

The mitigation measures set forth in the MMRP included in the Certified EIR and provided below remain applicable to the Modified Project. An additional mitigation measure is also provided below to address potentially significant impacts associated with localized emissions from construction of the Modified Project.

(a) Construction

Mitigation Measure D-1: General contractors shall implement a fugitive dust control program pursuant to the provisions of SCAQMD Rule 403.7

Mitigation Measure D-2: Disturbed areas shall be watered three times daily, which is above and beyond the SCAQMD Rule 403 requirement to water disturbed areas two times daily.

Mitigation Measure D-3: All construction equipment shall be properly tuned and maintained in accordance with manufacturer's specifications.

Mitigation Measure D-4: General contractors shall maintain and operate construction equipment so as to minimize exhaust emissions. During construction, trucks and vehicles in loading and unloading queues would turn their engines off, when not in use, to reduce vehicle emissions. Construction emissions should be phased and scheduled to avoid emissions peaks and discontinued during second-stage smog alerts.

Mitigation Measure D-5: Electricity from power poles rather than temporary diesel- or gasoline-powered generators shall be used to the extent feasible.

Mitigation Measure D-6: All construction vehicles shall be prohibited from idling in excess of ten minutes, both on- and off-site.

Mitigation Measure D-7: Project heavy-duty construction equipment shall use alternative clean fuels, such as low sulfur diesel or compressed natural gas with oxidation catalysts or particulate traps, to the extent feasible.

Mitigation Measure D-8: The Applicant shall utilize coatings and solvents that are consistent with applicable SCAQMD rules and regulations.

Mitigation Measure D-9: All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier 3 off-road emissions standards. In addition, all construction equipment shall be outfitted with Best Available Control Technology devices certified by the California Air Resources Board. Any emissions control device used by the contractor shall achieve emissions reduction that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by California Air Resources Board regulations.

(b) Operation

Mitigation Measure D-~~9~~10: The Applicant shall provide public education to USC Health Science Campus visitors and employees regarding the importance of reducing vehicle miles traveled and utilizing transit, and the related air quality benefits through the use of brochures and other informational tools.

Mitigation Measure D-~~10~~11: The Applicant shall, to the extent feasible, schedule deliveries during off-peak traffic periods to encourage the reduction of trips during the most congested periods.

Mitigation Measure D-~~11~~12: The Applicant shall coordinate with the MTA and the City of Los Angeles Department of Transportation to provide information with regard to local bus and rail services.

Implementation of the mitigation measures described above would reduce construction emissions for all pollutants. However, as shown in Table 6 on page 37, based on SCAQMD screening thresholds, the Modified Project would remain in exceedance of the SCAQMD localized significance threshold for NO_X during the most intense construction period. Therefore, the localized effects from the on-site construction emissions of NO_X were analyzed using the AERMOD dispersion model. The results of the dispersion modeling show that the maximum concentrations of NO_2 at an off-site sensitive receptor would occur at Hazard Park, just south of the Project Site. The maximum state and federal

Table 6
Mitigated Modified Project Localized Construction Emissions
(Pounds per Day)

Emission Source	CO	NO_X	PM_{10}	$PM_{2.5}$[a]
Modified Project				
Residential Demolition	18	12	8	1
Residential Earthwork	40	32	19	4
Residential Foundation	16	14	0	0
Residential Concrete/Steel/Frame	16	15	0	0
Residential Interior/Exterior Finishing	17	16	0	0
Residential Landscape/Paving	12	8	0	0
Hotel Demolition	14	10	2	0
Hotel Earthwork	29	21	12	3
Hotel Foundation	13	12	0	0
Hotel Concrete/Steel/Frame	15	14	0	0
Hotel Interior/Exterior Finishing	12	11	0	0
Hotel Landscape/Paving	11	7	0	0
HCCIII Demolition	14	11	1	0
HCCIII Earthwork	20	14	4	1
HCCIII Shoring	9	11	0	0
HCCIII Concrete/Steel/Frame	18	17	0	0
HCCIII Interior/Exterior Finishing	12	12	0	0
HCCIII Landscape/Paving	12	8	0	0
HCCIV Demolition	14	11	1	0
HCCIV Earthwork	20	14	5	1
HCCIV Shoring	9	11	0	0
HCCIV Concrete/Steel/Frame	18	17	0	0
HCCIV Interior/Exterior Finishing	12	12	0	0
HCCIV Landscape/Paving	12	8	0	0
Roadway Improvements				
Phase 3A.1 Demolition	10	12	0	0
Phase 3A.2 Grading	14	13	2	1
Phase 3A.3 Paving	7	5	0	0
Phase 3A.4 Demolition	10	12	0	0
Phase 3A.5 Grading	14	13	2	1
Phase 3A.6 Paving	7	5	0	0
Phase 3B.1 Demolition	10	11	0	0
Phase 3B.2 Grading	14	12	2	1
Phase 3B.3 Paving	7	5	0	0
Phase 3B.4 Demolition	10	11	0	0
Phase 3B.5 Grading	14	12	2	1
Phase 3B.6 Paving	7	5	0	0
Maximum Concurrent Peak Daily[b]	**80**	**72**	**27**	**6**

Table 6 (Continued)
Mitigated Modified Project Localized Construction Emissions
(Pounds per Day)

Emission Source	CO	NO_X	PM_{10}	$PM_{2.5}$[a]
Comparison to SCAQMD LSTs				
Modified Project Emissions	**80**	**72**	**27**	**6**
SCAQMD Significance Threshold[c]	3,188	68	68	21
Over/(Under)	(3,108)	4	(41)	(15)

[a] *Subsequent to completion of the Certified EIR, the SCAQMD promulgated $PM_{2.5}$ localized significance thresholds. As shown above, the Modified Project would result in less than significant localized construction $PM_{2.5}$ impacts.*

[b] *Maximum concurrent peak daily emissions of CO, PM_{10}, and $PM_{2.5}$ occur during the Earthwork phases of the Residential element, HCC III, and HCC IV. Maximum concurrent peak daily emissions of NOx occur during the Residential Concrete/Steel/Frame, HCC III Shoring, HCC III Concrete/Steel/Frame, HCC IV shoring, and HCC IV Concrete/Steel/Frame.*

[c] *SCAQMD LSTs based on SRA 1, 5-acre active site area, and 110-meter receptor distance. The SCAQMD localized threshold for NO_X was revised to account for the recently adopted 1-hour NO_2 NAAQS of 188 $\mu g/m^3$ or an incremental threshold of 46 $\mu g/m^3$ for SRA 1.*

Source: Matrix Environmental, 2013.

1-hour concentrations observed within the park boundaries are 39.05 $\mu g/m^3$ and 29.58 $\mu g/m^3$, respectively. The maximum annual concentration predicted to occur is 0.63 $\mu g/m^3$. Similar to the Original Project, and as shown in Table 7 on page 39, all of these maximum concentrations would remain below the state and federal ambient air quality standards at off-site sensitive receptors (see Appendix A). Additionally, due to a reduction in emission factors since the time of the Original Project's analysis, the Modified Project would reduce the significant and unavoidable impacts to localized PM_{10} emissions to less than significant. As such, localized impacts that may result from air pollutant emissions during the construction phases would be less than significant.

D. Biological Resources

1. Original Project Impacts

The Project Site is located in an urbanized location developed primarily with surface parking, ornamental trees, and landscaping designed as amenities to the streetscape, rather than as natural habitat. In addition, the Project Site is not located in or adjacent to any riparian area and is not identified in the City of Los Angeles General Plan as a natural, conservation, or open space resource. Additionally, no other adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved, local, regional, or state habitat conservation plan applies to the Project Site. Furthermore, the Project Site does not contain any natural hydrologic features or federally protected wetlands as defined by

Table 7
Maximum Ambient Construction Pollutant Impacts
($\mu g/m^3$)

Pollutant	Maximum Off-Site Concentration
NO_2—1-hr Concentration	
Maximum Increment (CAAQS)	39.1
CAAQS Background	226.2
CAAQS Background + Increment	265.3
SCAQMD Threshold	339
Significant Impact?	No
Maximum Increment (NAAQS)	29.6
NAAQS Background	141.9
NAAQS Background + Increment	171.5
SCAQMD Threshold	188
Significant Impact?	No
NO_1—Annual Concentration	
Maximum Increment	0.63
Background	52.83
Background + Increment	53.45
SCAQMD Threshold	57
Significant Impact?	No

Source: Matrix Environmental, 2013.

Section 404 of the Clean Water Act. In addition, any street trees requiring removal would occur in accordance with the City of Los Angeles Street Tree Division requirements. Lastly, the Project Site does not function as a wildlife corridor and no bodies or courses of water exist on-site to provide habitat for fish. Based on the above, the Project Site does not contain any notable natural features or natural habitat for species identified as candidate, sensitive, or of special status. As set forth in the Certified EIR, overall, no impacts to biological resources would occur, and no mitigation measures are necessary.

The surrounding area features Hazard Park, a 25-acre recreational resource, which has the potential to contain biological resources. However, the Project Site is physically separated from Hazard Park such that there is no direct interface between the Project Site and the park. Specifically, while Development Site A (the portion of the Project Site nearest to Hazard Park) and the park are located at opposite corners of the San Pablo Street/Eastlake Avenue intersection, actual buildings proposed on Development Site A would be separated from Hazard Park not only by San Pablo Street and Eastlake

Avenue/Norfolk Street, but also by intervening ornamental landscaping. Development Sites B, C, D, E, F, and G are located further from Hazard Park and are separated from the park by other HSC buildings. Therefore, due to the distance and the actual physical separation that exists between the Project Site and Hazard Park, the Project would not have an impact on any species that may inhabit Hazard Park.

2. Modified Project Impacts

As described above, there are no notable natural features or natural habitat for species identified as candidate, sensitive, or of special status within the HSC. In addition, as with the Original Project, removal of any street trees under the Modified Project would occur in accordance with the City of Los Angeles Street Tree Division requirements. Furthermore, removal of any on-site mature trees, which could potentially provide nesting sites for migratory birds, would be conducted in accordance with the Migratory Bird Treaty Act (MBTA) and the California Department of Fish and Game (CDFG) Code. Therefore, similar to the Original Project, the Modified Project would not result in impacts to biological resources, and no mitigation measures would be necessary. Such impacts would be within the envelope of impacts addressed in the Certified EIR.

E. Cultural Resources

1. Original Project Impacts

As discussed in the Certified EIR, none of the Development Sites contain any extant buildings, structures, objects, sites, or districts with any historical associations or significance necessary for California Register eligibility. Thus, the Project Site does not contain any historical resources as defined by the CEQA Guidelines. As such, the Certified EIR determined that no adverse impacts to significant historical resources would occur, and no mitigation measures are necessary.

As the Project Site is located within an urbanized area and has been subject to disturbance due to grading and development activities in the past, any surficial archaeological resources that may have existed on the site at one time are likely to have been disturbed or removed previously. In addition, as discussed in the Certified EIR, a records search conducted by the South Central Coastal Information Center of the California Historical Resources Information System reported no historic or prehistoric archaeological sites on the Project Site or within the HSC. Moreover, no unique paleontological or unique geologic resources have been identified on any of the Development Sites or in the surrounding area. Additionally, no human remains are known to be present. Any discovery of archaeological and paleontological resources and human remains during construction of the Project would be treated in accordance with federal, state, and local guidelines, as

appropriate. As such, any impacts are expected to be less than significant, and no mitigation measures are necessary.

2. Modified Project Impacts

As noted above, the Modified Project would continue to be developed within the HSC. As described above, there are no known historic resources within the Project Site. Therefore, similar to the Original Project, no direct impacts to historical resources would result from the Modified Project. In addition, as the Project Site is located within an urbanized area and has been subject to disturbance due to grading and development activities in the past, the potential for Project-related ground-disturbing activities to encounter archaeological and paleontological resources and human remains would be low. In addition, similar to the Original Project, any uncovering of archaeological and paleontological resources and human remains under the Modified Project would be treated in accordance with federal, state, and local guidelines, as appropriate. Therefore, as with the Original Project, potential impacts to cultural resources would be less than significant with the Modified Project. Such impacts would be within the envelope of impact addressed in the Certified EIR.

F. Geology and Soils

1. Original Project Impacts

As set forth in the Certified EIR, no known active faults pass through any of the Development Sites, nor are any of the Development Sites within an Alquist-Priolo Earthquake Fault Zone. However, the Project Site could be subject to moderate to strong ground shaking typical of the general southern California area. Therefore, development associated with the Original Project could result in the potential exposure of people and structures to ground shaking in the event of an earthquake. With adherence to applicable seismic standards, safety requirements and construction specifications, potential impacts related to strong seismic ground shaking would be less than significant, and no mitigation measures are necessary.

As indicated in the Certified EIR, the type and consistency of the soils and underlying bedrock as well as the extensive geologic history of the Project Site are such that the Original Project would not be expected to experience liquefaction or similar seismic ground failure. In addition, the probability of seismically-induced landslides occurring within the Project Site is remote. Furthermore, detailed geotechnical investigations that would be required in support of the City's issuance of grading and building permits and adherence to applicable safety requirements and construction specifications would identify and remedy any adverse conditions attributable to the presence of unstable/expansive soils. In addition, as Project development would not result in the substantial loss of topsoil and

construction activities would occur in accordance with applicable state and local regulations governing grading and site design, the Original Project is not expected to cause substantial soil erosion. As such, any impacts associated with landslides, liquefaction, unstable/ expansive soils, and soil erosion would be less than significant, and no mitigation measures are necessary.

2. Modified Project Impacts

The analysis of potential impacts associated with Project Site geology and soils provided below is based in part on information contained in the Certified EIR and in a Geotechnical Engineering Investigation prepared by Geotechnologies, Inc. dated December 22, 2011, and provided as Appendix B of this Addendum.

As described above, no known active faults pass through any of the Development Sites and none of the Development Sites are within an Alquist-Priolo Earthquake Fault Zone. Nonetheless, as with the Original Project, implementation of the Modified Project could result in the potential exposure of people and structures to ground shaking in the event of an earthquake. However, similar to the Original Project, the Modified Project would adhere to applicable seismic standards, safety requirements, and construction specifications. With implementation of these regulatory requirements, the Modified Project's impacts associated with the exposure of on-site populations, property, or structures to seismic hazards would be less than significant, and no mitigation measures are necessary.

Geological conditions of the Development Sites have remained substantially the same since preparation of the Certified EIR. Therefore, similar to the Original Project, development within these sites would also not result in liquefaction or landslides hazards that would expose people, property, or structures to an increased risk of hazard or damage. However, the streetscape improvements proposed along San Pablo Street, Alcazar Street, Eastlake Avenue, and Norfolk Street may be within or adjacent of a potentially liquefiable area.[9,10] However, the Modified Project would comply with City of Los Angeles Building Code requirements pertaining to development within areas susceptible to liquefaction and with the California Geological Survey Special Publication 117, which provides guidelines for

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[9] *California Division of Mines and Geology, State of California Seismic Hazard Zones, Los Angeles Quadrangle, March 25, 1999. Available at http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_la.pdf; accessed November 8, 2011.*

[10] *Los Angeles General Plan Safety Element, Exhibit B, Areas Susceptible to Liquefaction, page 49 (November 1996).*

evaluating and mitigating seismic hazards in California.[11] In addition, similar to the Original Project, the Modified Project would adhere to applicable safety requirements and construction specifications to remedy any adverse conditions attributable to the presence of unstable/expansive soils. Furthermore, as with the Original Project, the Modified Project would implement appropriate construction techniques to reduce any potential impacts associated with erosion. Additionally, detailed site-specific geotechnical studies that would be required in support of the City's issuance of grading and building permits would further minimize potential geological impacts. As such, similar to the Original Project, potential impacts associated with geology and soils under the Modified Project would also be less than significant and within the envelope of the impact analysis set forth in the Certified EIR.

G. Hazards and Hazardous Materials

1. Original Project Impacts

As discussed in the Certified EIR, potential hazards and hazardous materials impacts associated with the Original Project would primarily be limited to the use of potentially hazardous materials during construction and operation. Specifically, construction of the Original Project may include the use of paints, cleaning materials, vehicle fuels, oils, and transmission fluids. During operation, the Original Project could use medical hazardous materials and generate medical hazardous waste typical of medical clinic uses. Additionally, the Project may include nuclear medicine, which would involve the use of very small amounts of radioactive materials or radiopharmaceuticals for diagnosis and treatment of diseases. The Original Project may also generate limited quantities of hazardous materials associated with the routine use of the proposed parking facilities (e.g., leaks of engine oil, transmission fluid from vehicles). However, all potentially hazardous materials used during construction and operation would be contained, stored, used, and disposed of in accordance with all applicable federal, state, and local laws, regulations, and standards. In addition, the Original Project would be required to prepare an emergency response and evacuation plan, conduct hazardous materials training, and notify employees who work in the vicinity of hazardous materials, in accordance with federal OSHA and Cal OSHA requirements. Based on the preceding, the Original Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. In addition, no upset or accident is reasonably foreseen that would involve the creation of a significant hazard through the release of hazardous materials into the environment. As such, impacts would be less than significant, and no mitigation measures are necessary.

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[11] *California Department of Conservation, California Geological Survey, Seismic Hazards Zonation Program Laws and Guidelines. Available at www.conservation.ca.gov/cgs/shzp/Pages/SHMPpgminfo.aspx; accessed November 9, 2011.*

Any adverse conditions that are identified during the regulatory permitting and construction process for the Original Project associated with the inclusion of the HSC on lists of hazardous material sites compiled pursuant to Government Code Section 65962.5 would be satisfactorily addressed and mitigated to a less than significant level via compliance with applicable standards and regulations and no mitigation measures are necessary.

Implementation of the Original Project would not result in the closure of any street, particularly those designated as an evacuation route in an adopted emergency response or evacuation plan. To the extent feasible, construction activities and staging areas would not physically block any streets or impair access to and around the HSC or any adjacent properties. The proposed buildings would be designed to conform to the standards of the Los Angeles Fire Department for emergency egress and would be integrated into the existing HSC emergency response and evacuation plans. As such, potential impacts to adopted emergency response or evacuation plans would be less than significant, and no mitigation measures are necessary.

2. Modified Project Impacts

The following analysis addresses the Modified Project's potential impacts with regard to hazards and hazardous materials and is based in part upon information provided in the Certified EIR and in the Phase I Environmental Site Assessment prepared by California Environmental Geologists and Engineers, Inc., dated January 2012, and provided as Appendix C of this Addendum.

As excavation and earthwork activities under the Modified Project would be similar to those of the Original Project, the potential to release contaminants during these phases of construction would be generally the same as under the Modified Project. The Modified Project may result in additional construction activities compared to the Original Project due to increased development under Option 1. As such, the Modified Project may result in an increase in the handling and storage of hazardous materials during construction. Furthermore, as described in detail in Appendix C of this Addendum, it is possible that development of the Modified Project could encounter contaminated soil or underground features such as underground storage tanks associated with previous uses of the Project Site and the inclusion of the HSC on lists of hazardous material sites. However, with compliance with applicable standards and regulations and implementation of recommendations provided in the site-specific environmental site assessment, any potential hazards and hazardous materials impacts would be satisfactorily addressed and mitigated to a less than significant level. Therefore, the Modified Project would not create any new impacts with respect to hazardous materials during construction or would increase the severity of any previously identified impacts. Such impacts would be within the envelope of impacts provided in the Certified EIR.

As previously described, the Original Project provided for the construction of additional academic and medical-related floor area and parking facilities within the Project Site. In addition to these types of uses, the Modified Project would include the development of housing and hotel uses which would involve the limited use of hazardous materials typical of those used for such development. Specifically, the hotel and residential uses would involve the use and storage of small quantities of potentially hazardous materials in the form of cleaning solvents, paints, and pesticides for landscaping. Therefore, the change in land uses would not result in the use of more hazardous materials within the HSC. Notwithstanding, as with the Original Project, all potentially hazardous materials would be used and stored in accordance with manufacturers' instructions and handled in compliance with applicable federal, state, and local regulations. As such, the change in land uses that would occur under the Modified Project would not create any new impacts with respect to hazardous materials during operation, nor would the Modified Project increase the severity of any previously identified impacts. Thus, as with the Original Project, hazards and hazardous materials impacts during operation would be less than significant under the Modified Project. Such impacts would be within the envelope of impact analysis addressed in the Certified EIR.

Additionally, as with the Original Project, the proposed streetscape improvements would not physically block any streets, result in the full closure of any street, or impair access to and around the HSC or any adjacent properties. Specifically during construction, one traffic lane in each direction and at least one sidewalk would remain available at all times. Therefore, similar to the Original Project, potential impacts to adopted emergency response or evacuation plans would be less than significant under the Modified Project. Such impacts would be within the envelope of impacts provided in the Certified EIR.

H. Surface Hydrology and Water Quality, and Groundwater

1. Original Project Impacts

(a) Hydrology

As described above, construction of the Original Project would involve the demolition and removal of six surface parking lots and one vacant lot within the existing HSC. Replacement of these existing primarily impervious surfaces with proposed buildings would not substantially increase the amount of impervious cover that currently exists. As such, the amount of surface runoff would not substantially increase and the existing drainage pattern of the site would not be altered. In addition, in accordance with National Pollutant Discharge Elimination System (NPDES) permit requirements, a Standard Urban Stormwater Management Plan (SUSMP) would be implemented, which would ensure that post-development peak stormwater runoff discharge rates would not exceed the estimated

pre-development rates such that there would be an increased potential for downstream runoff. Furthermore, surface runoff would continue to be captured by existing drainage systems and any new drainage systems that may be installed to support development. Therefore, as the Project Site is currently impervious and would continue to be with implementation of the Original Project, the Original Project would not result in a substantial alteration to the existing drainage pattern or an increase in the rate or amount of on- or off-site surface runoff which could result in flooding, erosion, or siltation. Thus, impacts to hydrology would be less than significant, and no mitigation measures would be necessary.

The Project Site is not located within a 100-year flood plain or within an inundation area associated with the failure of a levee or dam. Therefore, the Original Project would not result in significant impacts associated with flood flows, and no mitigation measures are necessary.

(b) Surface Water Quality

An increase in urban contaminants may be expected from the increase in parking facilities on Development Site C and possibly Development Site D. However, the Original Project would be required to comply with state and local regulations governing water quality standards and waste discharge requirements associated with construction and operation of the facilities associated with the Original Project. In addition, as part of the Original Project, SUSMP requirements would be implemented, which may include, but not be limited to: minimizing stormwater pollutants of concern; providing storm drain system stenciling and signage; containing properly designed outdoor material storage areas; containing properly designed trash storage areas; and providing proof of ongoing BMP maintenance. As such, the Original Project would result in less than significant impacts to water quality, and no mitigation measures would be necessary.

(c) Groundwater

The water needs of the Original Project would be met by the Los Angeles Department of Water and Power, which draws its water supplies from distant sources for which it conducts its own assessment and mitigation of potential environmental impacts. In addition, the HSC is mostly developed and contains minimal amounts of pervious surfaces that allow water infiltration. Furthermore, as noted above, the Original Project would replace existing impervious surfaces with new impervious surfaces. Therefore, the Original Project would not result in an increase of impervious area, which could marginally reduce percolation and result in a reduction in groundwater recharge. As such, groundwater impacts would be less than significant and no mitigation measures are necessary.

2. Modified Project Impacts

(a) Hydrology

As described above, the seven Development Sites include six surface parking lots and one vacant lot within the existing HSC. In addition, the area of the streetscape improvements is developed with roadways and sidewalks, street lights, utility poles, and limited ornamental landscaping in the form of trees and shrubs. Thus, the Project Site is comprised almost entirely of impervious surfaces. The Modified Project would replace these existing primarily impervious surfaces with new impervious surfaces as well as additional landscaping. Therefore, with the implementation of this additional landscaping, the rate and amount of stormwater runoff would decrease slightly under the Modified Project compared to the Original Project and would continue to be captured by the existing storm drain infrastructure or any new drainage system that may be installed as part of the Modified Project. Thus, development of the Modified Project would not result in an increase in the amount of impervious surface which could contribute additional runoff. Therefore, as with the Original Project, the Modified Project would result in less than significant impacts to hydrology. Such impacts would be within the envelope of impact analysis addressed in the Certified EIR.

(b) Surface Water Quality

As with the Original Project, continued compliance with NPDES requirements and local regulations that include BMPs would ensure that construction activities associated with the Modified Project would not degrade the surface water quality of receiving waters to levels below standards considered acceptable by the Los Angeles Regional Water Quality Control Board or other regulatory agencies or impair the beneficial uses of the receiving waters. In addition, construction of the Modified Project would not result in a violation of any water quality standards or waste discharge requirements and would not otherwise substantially degrade water quality. Therefore, as with the Original Project, construction-related impacts to surface water quality would be less than significant under the Modified Project. Such impacts would be within the envelope of impacts addressed in the Certified EIR.

Similar to the Original Project, pollutants typically associated with urban uses, such as oil and grease, metals, fertilizers, pesticides, dirt from landscaped areas, and litter, would be produced during operation of the Modified Project. However, it is anticipated that with the additional landscaping to be provided by the Modified Project, the amount of pervious area would be increased within the HSC. Therefore, the Modified Project would result in a reduced potential for urban pollutants to be conveyed into nearby storm drains during stormwater events. In addition, similar to the Original Project, the Modified Project would be required to comply with SUSMP requirements during the operational life of the Project. Such requirements would include source control BMPs, treatment control BMPs,

and requirements regarding erosion control. Therefore, as with the Original Project, with compliance with such requirements, impacts to surface water quality during operation would be less than significant under the Modified Project. Such impacts would be within the envelope of impact analysis provided in the Certified EIR.

(c) Groundwater

As noted above, the Modified Project would replace existing primarily impervious surfaces with new impervious surfaces and additional landscaping. Therefore, as with the Original Project, the Modified Project would also not result in an increase of impervious area which could marginally reduce percolation and result in a reduction in groundwater recharge. Thus, impacts to groundwater hydrology would be less than significant and within the envelope of impact analysis addressed in the Certified EIR.

Based on the Geotechnical Engineering Investigation included as Appendix B of this Addendum, minor to moderate seepage of groundwater was encountered at depths between 12 and 24 feet below the existing site grade of Development Site E. In addition, according to the California Geological Survey Seismic Hazard Zone Report, the historically highest groundwater level is on the order of 25 feet below grade. Furthermore, water seepage was encountered at depths between 5 and 14½ feet under a prior geotechnical investigation conducted in 2002. Construction activities for the Modified Project could require excavation of up to 30 feet below ground surface for development of the HCC IV. Therefore, there is a possibility that, during excavation activities, some seepage will be encountered and dewatering may be necessary. As indicated in Appendix B, it is anticipated that any seepage encountered could be mitigated on an as-encountered basis through the use of small channels at the base of the excavations leading to temporary sump pits, or to the lower end of the site. In addition, any discharge of groundwater during construction of the Modified Project would occur pursuant to, and comply with, the applicable NPDES permit requirements. Furthermore, the Modified Project would also comply with all applicable federal, state, and local requirements concerning the handling, storage, and disposal of hazardous materials to effectively reduce the potential for the construction of the Modified Project to release contaminants into groundwater. As such, construction activities associated with the Modified Project would not degrade groundwater quality, and impacts would be less than significant. Such impacts would be within the envelope of impacts identified in the Certified EIR.

I. Land Use and Planning

1. Original Project Impacts

The Project Site is subject to the land use plans and policies of the City of Los Angeles General Plan Framework, the Northeast Los Angeles Community Plan

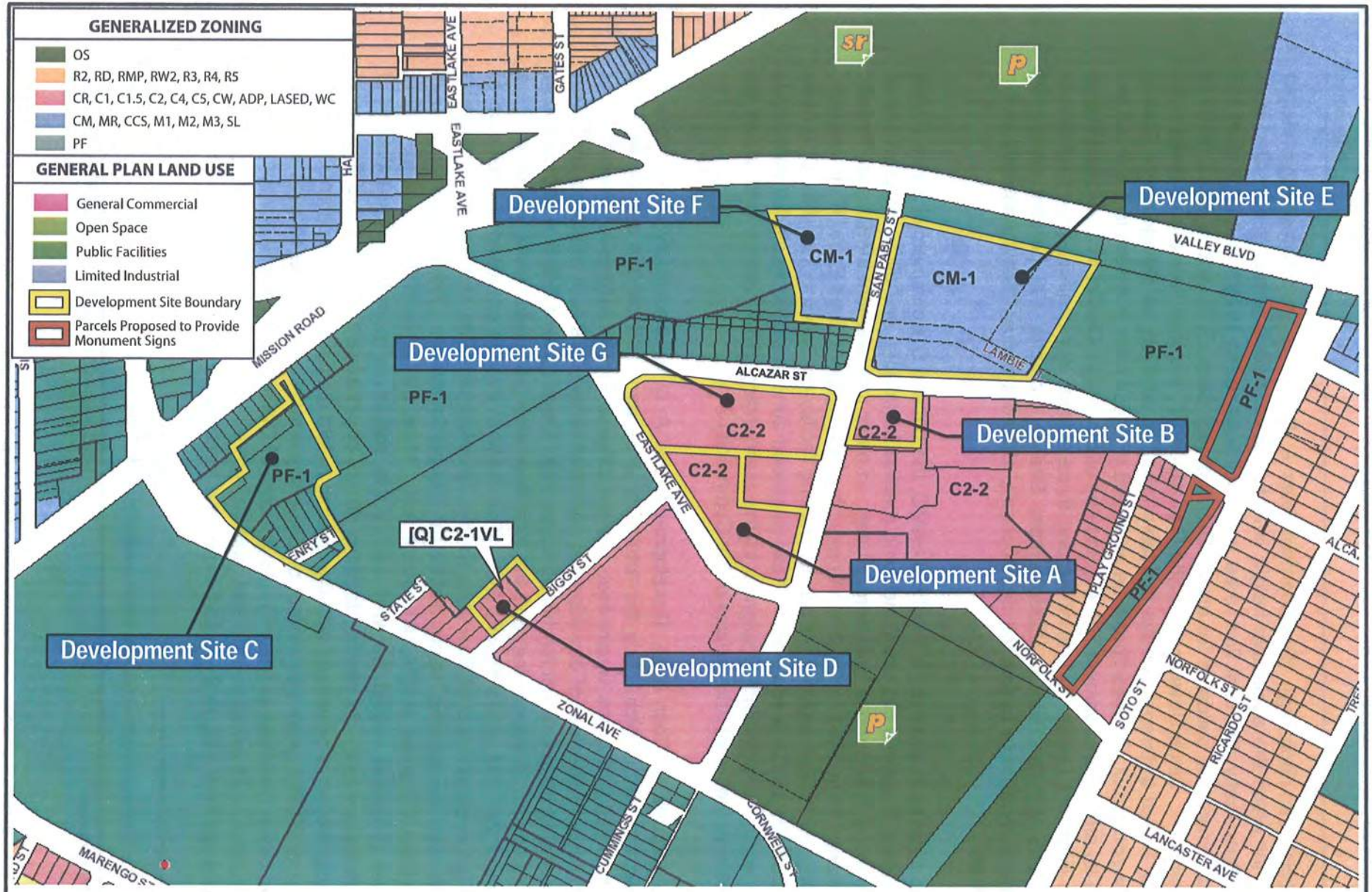
(Community Plan), and the Adelante Eastside Redevelopment Plan. Regional plans governing planning and land use issues at the Project Site include the SCAG Regional Comprehensive Plan and Guide, the Los Angeles County Metropolitan Transportation Authority (Metro) Congestion Management Plan, and the SCAQMD Air Quality Management Plan (AQMP). In addition, the Project Site is subject to the provisions of the City of Los Angeles Zoning Code, Chapter 1 of the City of Los Angeles Municipal Code (LAMC), which, in part, facilitates implementation of Community Plan objectives through land use designations and development standards. A summary of the Original Project's consistency with these applicable plans and policies is provided below.

(a) Northeast Los Angeles Community Plan

As shown in Figure 5 on page 50, per the Community Plan, Development Sites A, B, D, and G are designated as General Commercial, while Development Site C is designated for Public Facilities. Development Sites E and F are designated Limited Industrial. The proposed academic, medical research, and medical office uses and potential parking facilities would be compatible with the uses designated for the Project Site as defined in the Community Plan. In addition, the Original Project would be consistent with the site planning, neighborhood compatibility, landscape, access, aesthetic, light and glare and transit oriented goals of the Community Plan. Specifically, the architectural style of proposed buildings would be similar to the existing HSC buildings and articulated surfaces on building walls would avoid large, sterile expanses on building walls. Proposed buildings would also feature signage and lighting consistent with existing HSC operations. Furthermore, the Original Project would include the creation of new exterior courtyards and walkways between and around proposed buildings, which would serve to create a pedestrian-friendly campus environment that would facilitate pedestrian access to the entire facility by limiting pedestrian and vehicle interfaces and providing parking at selected locations within the HSC. Additionally, the proposed change in the land use designations of Development Site C from Public Facilities to General Commercial and Development Sites E and F from Limited Industrial to General Commercial would be compatible with the designations of the surrounding HSC parcels and would be compatible with the intent and policies of the Community Plan. Moreover, the proposed vacation of Henry Street would have no bearing on land uses in and around the Project Site as this street has been paved over and out of circulation for over twenty years and is entirely internal to Development Site C. Based on the above, land use impacts of the Original Project in relation to the Northeast Los Angeles Community Plan would be less than significant.

(b) Los Angeles Municipal Code

Per the LAMC, Development Sites A, B, and G are zoned C2 (Commercial), while Development Site C is zoned PF (Public Facilities) and Development Site D is zoned [Q]C2-1VL (Commercial, Height District 1VL). Development Sites E and F are zoned CM



Source: City of Los Angeles ZIMAS, 2013.

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Figure 5
Existing Land Use Designations and Zoning

(Commercial Manufacturing). Development Sites A, B, and G are located within Height District 2 for which the applicable height limitation is defined in terms of permitted floor area.12 Specifically, the total floor area in all buildings within Height District 2 shall not exceed six times the buildable lot area. Development Sites C, E, and F are located in Height District 1. Since Development Site C is zoned PF, the total floor area permitted on this site is limited to three times the buildable area. In addition, as Development Sites E and F are zoned CM, the total floor area permitted on these sites is limited to 1.5 times the buildable lot area. Development Site D is located within Height District 1VL. No building or structure in Height District 1VL shall exceed three stories, nor shall it exceed 45 feet in height. The [Q] condition on Development Site D prohibits 100 percent residential development, and limits residential development, should it occur, to that permitted in the RD1.5 zone.

As detailed in Section 12.14 of the LAMC, the C2 and CM commercial zones permit a wide variety of commercial uses, including medical laboratory, and allow the provision of surface parking in support of commercial uses. In order to implement the Original Project, a zone change from CM-1 to C2-2 is proposed for Development Sites E and F. In addition, as the Original Project proposes a private parking facility on Development Site C, a zone change from PF to C2 is required. These proposed zone changes would be compatible with the zoning designations assigned to the surrounding HSC parcels and would be consistent with the intent and policies of the Community Plan.

In regards to floor area, Development Site A is approximately 2.46 acres or 91,912 square feet in size. Thus the total floor area permitted on this site would be a maximum of 551,472 gross square feet. As the Original Project proposed a maximum of 465,000 gross square feet of development on Development Site A, it would be consistent with the existing height district for this particular site. Development Site B is approximately 1.13 acres or 49,223 square feet and the total floor area permitted would, therefore, be a maximum of 295,338 gross square feet. The Original Project proposed a maximum of 295,338 gross square feet of floor area for this Development Site and would therefore be consistent with the existing height district for this particular site. Development Site G is approximately 4.0 acres or 174,240 square feet. Thus, the up to 100,000 square feet of floor area proposed would be well within the maximum permitted development of 1,045,440 square feet. As parking facilities do not count toward the permitted floor area, the Original Project is consistent with the existing height district for Development Site C. A maximum of 50,312 gross square feet of University and/or medical-related uses would be permitted within Development Site D. As the size of Development Site D is approximately 0.77 acre, or 33,541 gross square feet, and the site is within Height District 1VL, a height district change from 1VL to 2 would be required to comply with the LAMC. Development

[12] *Total floor area and height limitations are regulated by LAMC Section 12.21.1.*

Site E is approximately 7.64 acres in size and would permit a maximum of 499,198 gross square feet, while Development Site F is approximately 2.65 acres permitting a maximum floor area of 115,434 gross square feet. Although the proposed development on Development Site E is consistent with the existing height district, the Original Project proposes a height district change to Height District 2 to provide for a consistent Height District 2 across the Project Site. In addition, as the maximum amount of development proposed for Development Site F would exceed the permitted floor area, a height district change from 1 to 2 would also be required for this Development Site. However, the heights of proposed buildings that may occur on Development Sites D, E, and F would be consistent with the heights of the surrounding HSC structures. Furthermore, the location of these Development Sites would be sufficiently distant from Lincoln and Hazard Parks and off-site residential uses so as to not alter the land use relationships that currently exist.

(c) General Plan Framework

The Metro Long Range Land Use Diagram of the General Plan Framework designates the Project Site as a Community Center. The Original Project proposes to develop academic and medical-related facilities on sites that are currently used as surface parking lots or are undeveloped within the existing HSC. These proposed uses are consistent with the uses permitted within the Community Center General Plan Land Use designation. In addition, development of these sites would preserve the character of the surrounding neighborhood, as the proposed development would assist in enhancing the established HSC with similar uses. On an overall basis, the Original Project would enhance the urban character of the Project Site area and with the proposed improvements, the Original Project's land use impacts in relation to the City's General Plan Framework would be less than significant.

(d) Adelante Eastside Development Project

The principal goal of the Adelante Eastside Development Project is to improve living conditions, upgrade public improvements, increase commercial choices, and revitalize the industrial base while preserving existing businesses and industry. As the Original Project would preserve and enhance the existing HSC, a unique commercial and institutional resource of the community, the Original Project is consistent with the policies or goals of the Adelante Eastside Redevelopment Plan.

(e) Regional Plans

As the Original Project would be developed in an established area of the City, in which existing facilities and infrastructure are already in place and would be available to the Original Project, and as the Original Project would be served by the nearby San Bernardino (I-10), and Golden State (I-5) Freeways as well as public transit via the Metro, DASH, and

USC shuttle systems, the impact of the Original Project on RCPG policies would be less than significant. In addition, development of the Original Project would result in less than significant impacts with regards to the Los Angeles County CMP. Furthermore, as the Original Project would not result in an increase in the frequency or severity of an existing air quality violation or create a new violation, the Original Project would be consistent with the AQMP.

(f) Project Compatibility with Surrounding Land Uses

Development of academic and medical-related facilities on the seven Development Sites would be consistent with the existing uses found within the HSC. In addition, as part of an established campus of related land uses, the proposed buildings would not physically divide an established community, but rather would assist in infilling the established HSC with similar uses. Similarly, the development of parking facilities on one or more of Development Sites B, C, D, E, and F would not result in the physical separation of any established community.

The HSC is bounded by public, commercial, institutional, residential, and recreational land uses. The closest residential uses are located approximately 700 feet east of Development Site B along the east and west sides of Playground Avenue, which bisects the eastern portion of the HSC. However, no land use compatibility impacts between the Development Sites and these residential uses are anticipated, as existing HSC structures separate the Development Sites from these residential uses. In addition, with regards to nearby recreational uses, Lincoln Park is located approximately 0.25 mile from the nearest Development Site and is further separated from the Project Site by Valley Boulevard and the railroad tracks that parallel the southern side of Valley Boulevard and existing HSC structures. Additionally, while Development Site A and Hazard Park are located at opposite corners of the intersection, any buildings on Development Site A would be separated from Hazard Park by San Pablo Street and Eastlake Avenue/Norfolk Street, and also by the ornamental landscape buffer that exists directly north of Eastlake Avenue. The remaining Development Sites are located further north from Hazard Park and are separated from the park by existing HSC buildings. Furthermore, the development of additional academic, medical-related, and academic support facilities within the existing HSC would be compatible with the surrounding institutional uses given their similarities in land use classification. In conclusion, the height of the proposed structures would not substantially contrast with the surrounding area, since the proposed structures would be consistent in scale with the existing HSC structures, as well as the other nearby institutional and public uses in the vicinity of the Project Site. Therefore, the land use impacts of the proposed uses on the Project Site relative to compatibility with the nearby land uses would be less than significant.

2. Modified Project Impacts

As described above, a modification to the Original Project has been proposed to change the type of development previously planned for Development Site E. Specifically, as shown in Table 1 on page 13, the maximum amount of development analyzed in the Certified EIR for Development Site E of between 118,000 square feet of medical clinic facilities and up to 400,000 square feet of academic and/or medical research facilities, and parking facilities would be substituted for graduate student housing uses comprising approximately 238,500 square feet and providing 185 dwelling units, amenities, and a child care center. A hotel providing up to 275 rooms may also be constructed within Development Site E adjacent to the proposed graduate student housing uses. In addition, a modification to the maximum amount of square footage to be developed is proposed. Specifically, the Applicant proposes to provide flexibility in the amount and type of floor area to be developed so long as the peak-hour vehicle trips do not exceed that set forth in the Certified EIR. Furthermore, the Modified Project also proposes to modify the existing roadway classifications to allow for pedestrian enhancements and aesthetic improvements within the HSC. As described above, discretionary approvals proposed under the Modified Project include the following:

- General Plan Amendment from Limited Industrial to General Commercial or Neighborhood Commercial for Development Site E;
- General Plan Amendment to the Northeast Los Angeles Community Plan and the Transportation Element of the City of Los Angeles General Plan for reclassification of San Pablo Street, Alcazar Street, Eastlake Avenue, Norfolk Street, Biggy Street, and Playground Street;[13]
- General Plan Amendment to change the land use designation on two parcels located southwest and one parcel located northwest of Alcazar Street and Soto Street from Public Facilities to General Commercial;
- Zone Change from CM-1 and [T][Q]CM-1 to [T][Q]C2-2 for Development Site E;
- Zone Change for two parcels located southwest and one parcel located northwest of Alcazar Street and Soto Street from PF-1 to [Q]C2-1;
- Subdivision approval (parcel map or lot line adjustment) to create separate legal parcels for the hotel and student housing projects;

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[13] *As indicated in the memo from the City of Los Angeles Bureau of Engineering dated September 24, 2012, and included as Appendix E of this Addendum, the Bureau of Engineering reviewed the proposed roadway reclassifications and provided clarifications regarding the requested General Plan Amendment. Specifically, the Bureau of Engineering determined that previous improvement conditions would need to be deleted as part of the requested General Plan Amendment, as they are obsolete or inconsistent with the changes proposed by the Modified Project.*

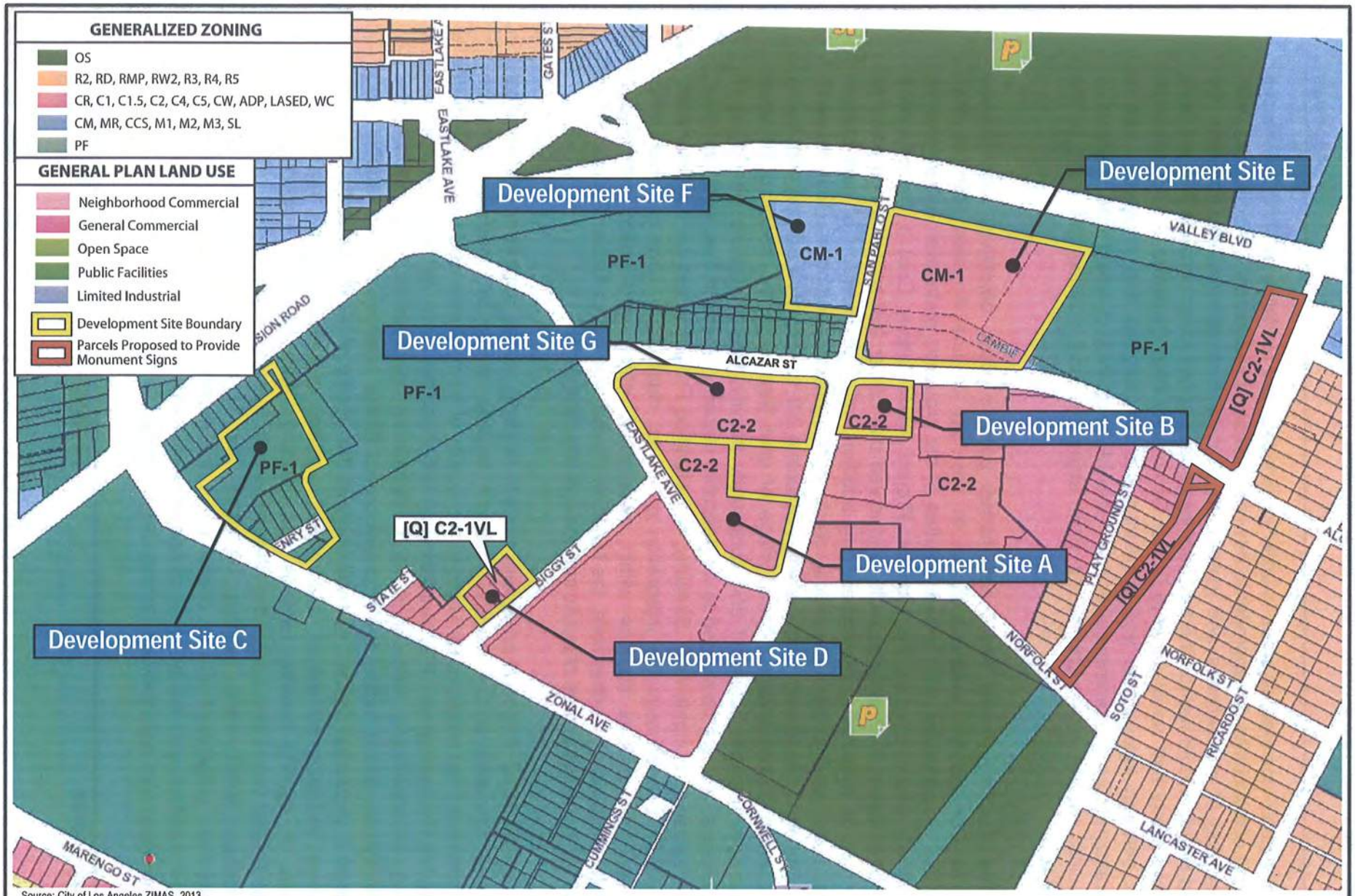
- Conditional Use Permit for alcohol service in the hotel;
- Site Plan Review for the various projects pursuant to LAMC § 16.05.C;
- Haul Route Permit;
- Grading, excavation, and building permits; and
- Any other City of Los Angeles permits or approvals as may be required.

Figure 6 on page 56 illustrates the proposed changes in land use designations and zoning.

(a) Consistency with Local and Regional Plans

As indicated above, a General Plan Amendment to change the Community Plan designation of Development Site E from Limited Industrial to General Commercial or Neighborhood Commercial is proposed to provide for the hotel/student housing uses proposed under the Modified Project. In addition, the Modified Project also proposes a General Plan Amendment to the Community Plan and the Transportation Element of the General Plan for reclassification of San Pablo Street, Alcazar Street, Eastlake Avenue, Norfolk Street, Biggy Street, and Playground Street to allow for enhancements to the existing pedestrian and aesthetic environment of the HSC. Furthermore, as shown in Figure 6, the Modified Project includes an additional General Plan Amendment to change the land use designation on two parcels located southwest and one parcel located northwest of Alcazar Street and Soto Street from Public Facilities to General Commercial to accurately reflect private ownership and also allow the placement of monument signage.

With the inclusion of new student housing and hotel uses as well as additional medical clinic, and academic and/or medical research facilities, the Modified Project would serve to enhance the existing HSC by expanding the range of uses currently provided. In addition, with implementation of the proposed pedestrian enhancements and aesthetic improvements, the Modified Project would promote walkability, increase outdoor space, improve connections within the HSC, improve vehicular circulation around the campus, and enhance linkages between the adjacent Lincoln Park and Hazard Park. The design of new buildings would also continue to incorporate streetscape improvements, exterior courtyards, landscaped walkways between buildings, and new landscaping. Furthermore, new buildings would be similar in height to existing buildings within the Project vicinity and would be designed with high quality architecture. Therefore, like the Original Project, the Modified Project would further Community Plan Policy 6-1.1, which seeks to "encourage compatibility in school locations, site layout, and architectural design with adjacent land uses and community character." In addition, the new hotel uses to be provided under the Modified Project would further Community Plan Objective 2-1, to "conserve and strengthen



Source: City of Los Angeles ZIMAS, 2013.

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Figure 6
Proposed Land Use Designations and Zoning

potentially viable commercial areas in order to stimulate and revitalize existing businesses and create opportunities for appropriate new commercial development." Additionally, with the narrowing of intersections and installation of curb extensions, where feasible, the Modified Project would reduce the potential for pedestrian/vehicular conflicts and enhance pedestrian safety and would serve to further Community Plan Objective 2-3, to "minimize conflicts between auto-related and pedestrian-oriented activities and encourage use of public transportation in commercial areas." The Modified Project would also continue to support the several other Community Plan objectives and policies set forth in the Certified EIR.

The Modified Project would also further specific goals, objectives, and policies related to Community Centers included in the City of Los Angeles General Plan Framework. In particular, with implementation of the proposed pedestrian enhancements and aesthetic improvements, the Modified Project would further Goal 3, "to provide a pedestrian-oriented, high activity, multi- and mixed use center that supports and provides identity for Los Angeles' communities." In addition, with the provision of new student housing, hotel, and additional medical clinic, and academic and/or medical research facilities, the Modified Project would support Objective 3.9, to "reinforce existing community centers, which accommodate a broad range of uses that serve the needs of adjacent residents, promote neighborhood and community activity, are compatible with adjacent neighborhoods, and are developed to be desirable places in which to live, work, and visit, both in daytime and nighttime." Similarly, the Modified Project would be consistent with Policy 3.9.2 to "encourage the integration of school classrooms, libraries, and similar educational and cultural facilities within commercial, office, and mixed commercial-residential structures." Furthermore, the Modified Project would also further Policy 3.9.7 to "provide for the development of public streetscape improvements."

The Modified Project's proposed student housing, hotel, and additional medical clinic, and academic and/or medical research facilities would be consistent with the Redevelopment Plan objective to "improve the quality of life for those who live and work in and visit the Redevelopment Plan Area through enhanced business, employment, housing, shopping, entertainment, recreational, and educational opportunities." In addition, the Modified Project would further the Redevelopment Plan's goal/objective to "support and encourage a circulation system that will improve the quality of life in the Redevelopment Plan Area, including pedestrian, automobile, parking, and mass transit system, with emphasis on serving existing facilities and meeting future needs." Additionally, the Modified Project would also further the Redevelopment Plan's goals/objectives to "preserve and increase employment, training, business, and investment opportunities through redevelopment programs." On an overall basis, the modifications to the Original Project would not interfere with the types of development already present within and around the HSC and would also not inhibit implementation of applicable regional plans.

Based on the above, with approval of the proposed land use designation change, no significant impacts associated with consistency with the land use plans would occur and such impacts would be within the envelope of impacts set forth in the Certified EIR.

(b) Consistency with Zoning

As described above, the applicable height limitation for each of the Development Sites is defined in terms of permitted floor area. The proposed HCC IV building within Development Site B is anticipated to have a maximum height of 95 feet and a maximum floor area of 106,700 square feet. As Development Site B is zoned C2 and is within Height District 2, the total floor area shall not exceed six times the buildable lot area. Development Site B is approximately 1.13 acres or 49,223 square feet and the total floor area permitted would, therefore, be a maximum of 295,338 gross square feet. When accounting for development underway for Development Site B (HCC III), and the maximum development proposed for HCC IV, the total floor area within Development Site B would be approximately 271,800 square feet. Based on the proposed height and maximum development proposed, development within Development Site B under the Modified Project would be within the height and floor area limits set forth by existing zoning and consistent with the building heights analyzed in the Certified EIR. In addition, the proposed uses would be consistent with existing zoning and consistent with the uses evaluated in the Certified EIR.

With regard to Development Site E, the Modified Project proposes to provide student housing uses comprising approximately 238,500 square feet and possibly hotel uses comprising up to 250,000 square feet. The height of the new student housing buildings would be approximately 67 feet, while the height of the hotel building would be a maximum 175 feet. Based on existing zoning, the maximum permitted floor area for Development Site E shall not exceed 499,198 square feet. In addition, with approval of the zone change from CM-1 and [T][Q]CM-1 to C2-2, which would permit a floor area up to six times the buildable lot area, the maximum floor area permitted within Development Site E would increase to 1,996,790. Thus, the maximum floor area of 488,500 proposed for Development Site E under the Modified Project would be well within the permitted floor area set forth by existing and proposed zoning. In addition, the proposed student housing and hotel uses would be consistent with the uses permitted under the proposed C2-2 zone. Furthermore, as described above under Subsection A, Visual Resources, the height increase associated with the hotel would be compatible with the maximum heights allowed in other Development Sites, including Development Sites A and B (150 feet) and existing multi-story buildings within and surrounding the HSC such as the nearby Los Angeles County/USC Medical Center building (247 feet).[14] Therefore, the increase in height and

[14] *Emporis, Building Directory, www.emporis.com/building/losangelescountyuscmedicalcenter-losangeles-ca-usa, accessed March 28, 2012.*

proposed student housing and hotel uses for Development Site E would not pose any inconsistencies with applicable land use regulations should the requested discretionary actions be approved by the City. Thus, significant impacts associated with consistency with zoning would not occur and such impacts would be within the envelope of impacts set forth in the Certified EIR.

Additionally, as previously noted, the proposed zone change for two parcels located southwest and one parcel located northwest of Alcazar Street and Soto Street from PF-1 to [Q]C2-1 is proposed to accurately reflect private ownership and allow for the installation of monument signage within these parcels. The development of new buildings or other structures within these parcels is not proposed as part of the Modified Project. In addition, the proposed Q condition would prohibit further development within these parcels without a plan approval. As such, the installation of monument signage within these parcels would not introduce any inconsistencies with applicable land use regulations as the proposed zone change would be consistent with existing adjacent zoning and land uses. Therefore, no significant impacts with consistency with zoning would occur and such impacts would be within the envelope of impacts set forth in the Certified EIR.

(c) Land Use Compatibility

With regard to land use compatibility, though the Modified Project proposes a change in the land uses previously planned for Development Site E, the proposed hotel and student housing uses would be consistent and compatible with the land use mix of the surrounding area. In addition, the design of the proposed structures would be compatible with the existing HSC buildings and the nearby institutional and residential uses surrounding the HSC. Furthermore, based on the location of the Development Sites within the HSC campus, the Modified Project would not disrupt or divide a community. Additionally, with implementation of the proposed streetscape improvements, no public roadways or sidewalks would be permanently closed or relocated and no separation of uses or disruption of access between land uses would occur. The Modified Project would result in the continued use of the internal roadways for vehicular and pedestrian access and the overall HSC for educational, research, and medical purposes and would be consistent in terms of use and general character with the surrounding uses. Thus, the Modified Project would result in less than significant impacts with regard to land use compatibility. Such impacts would be similar to those of the Original Project, and within the envelope of impact analysis addressed in the Certified EIR.

J. Mineral Resources

1. Original Project Impacts

The Project Site is not located in an area containing significant mineral deposits, as designated by the City of Los Angeles. In addition, the applicable local land use plans do not delineate that the Project Site or the surrounding area contain significant mineral deposits or are designated as a locally important mineral resource site. Therefore, development associated with the Original Project would not change the availability of known or potential mineral resources or result in the loss of availability of a locally important mineral resource recovery site delineated on a land use plan. As such, no impacts to mineral resources would occur and no mitigation measures are necessary.

2. Modified Project Impacts

As described above, the Project Site does not contain mineral deposits and such uses are not proposed as part of the Modified Project. Therefore, similar to the Original Project, no impacts to mineral resources would result from the Modified Project. Such impacts would be within the envelope of impact addressed in the Certified EIR.

K. Noise

As described further in the Certified EIR, sound pressure is measured and quantified using a logarithmic ratio, the scale of which gives the level of sound in decibels (dB). The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate this human, frequency-dependent response, the A-weighted system is used to adjust measured sound levels. The A-weighted sound level is expressed as "dBA." In addition, time variation in noise exposure is typically expressed in terms of the average energy over time (L_{eq}), or alternatively, as a statistical description of the sound level that is exceeded over some fraction of a given period of time. In accordance with the City of Los Angeles Noise Regulation limits for residential zones, a noise level increase of 5 dBA over the existing average ambient noise level at an adjacent property line is considered a noise violation. Furthermore, the City of Los Angeles has also adopted local guidelines based, in part, on the community noise compatibility guidelines established by the State Department of Health Services for use in assessing the compatibility of various land use types with a range of noise levels. These guidelines are set forth in the City of Los Angeles CEQA Thresholds Guide (Thresholds Guide) in terms of the Community Noise Equivalent Level (CNEL). A CNEL value of 70 dBA is the upper limit of what is considered a "normally acceptable" noise environment for business and professional commercial uses, although a CNEL as high as 77 dBA is considered "conditionally acceptable."

1. Original Project Impacts

(a) Construction

Maximum daytime noise level increases with Original Project construction would meet or exceed the 5 dBA noise level increase established by the City of Los Angeles Noise Regulation, and as such, impacts would be significant. With implementation of Mitigation Measure E-1 provided below, noise levels associated with construction activities would be reduced to some extent but would not be reduced below the significance threshold. As such, noise impacts associated with on-site construction noise are considered significant and unavoidable.

In addition to on-site construction noise, haul trucks, delivery trucks, and construction workers would require access to the site throughout the construction duration. While construction workers would arrive from many parts of the region, haul trucks and delivery trucks would generally travel to the Project Site via Soto Street from the Interstate 10 Freeway. Although residential uses are present on the east side of Soto Street, construction traffic would not be present during the noise-sensitive late evening and nighttime hours. As such, potential impacts associated with construction traffic would be less than significant, and no mitigation measures are necessary.

(b) Operation

Operational noise impacts associated with the Original Project could occur from traffic noise; mechanical equipment such as boilers, chillers, pumps, and emergency generators; loading docks and refuse collection/recycling areas; proposed parking structures and surface parking lots associated with the activation of car alarms, sounding of car horns, slamming of car doors, engine revs, and tire squeals; and emergency helipads.

Regarding traffic noise, the incremental Project-related traffic noise level increases would be less than the specified thresholds, as described above, and would be less than significant. In addition, with compliance with City of Los Angeles Noise Ordinance requirements, impacts associated with mechanical equipment would also be less than significant. Noise associated with loading docks and refuse collection/recycling areas, however, could potentially affect the areas located immediately north and west of Development Site D (Juvenile Hall uses). With implementation of Mitigation Measure E-2, provided below, these impacts would be reduced to less than significant. With regard to potential noise impacts associated with proposed parking structures and surface parking lots, noise level increases were determined to be less than the City of Los Angeles Noise Regulation significance threshold at areas adjacent to potential Development Site locations. Lastly, due to the infrequent and emergency-only nature of helipad uses, adverse noise impacts related to such use would be less than significant.

2. Modified Project Impacts

(a) Construction

As previously described, the Modified Project involves modifications to the land use mix of the Original Project. The Modified Project also proposes to improve the existing pedestrian and aesthetic environment along San Pablo Street, Alcazar Street, Eastlake Avenue, Norfolk Street, Biggy Street, Playground Street, and Zonal Avenue between San Pablo Street and Biggy Street. The street improvements and modification to permit student and hotel uses as well as additional medical clinic and non-medical uses would not substantially change the types of construction activities compared to the Original Project. Therefore, peak daily construction activities and resulting noise levels of the Modified Project would be similar to the Original Project. In addition, the development proposed under the Modified Project would continue to be implemented within several of the Development Sites analyzed in the Certified EIR. Thus, as the distance to sensitive receptors and the intensity of construction activities would not change, construction noise levels for the Modified Project would be similar to the Original Project. In addition, the Modified Project would implement the same construction mitigation measure, as applicable, identified for the Original Project. Therefore, the Modified Project would not create any new significant impacts related to construction noise nor result in a substantial increase in a previously identified significant impact. As such, construction noise impacts under the Modified Project would be within the envelope of impact analysis addressed in the Certified EIR.

(b) Operation

As the type and intensity of uses proposed under the Modified Project were specifically developed within the remaining trip generation of the Certified EIR, the volume and distribution of traffic under the Modified Project would be comparable to the Original Project. Thus, similar to the Original Project, operational traffic noise associated with the Modified Project would be less than the specified thresholds. In addition, though the Modified Project involves modifications to the land use mix of the Original Project, the new residential and hotel land uses would not typically involve operations that generate noise levels that would exceed the existing noise levels within and surrounding the HSC or those anticipated under the Original Project. Additionally, noise levels associated with the proposed childcare center outdoor play area would be consistent with existing land uses, including the nearby Lincoln Park and HSC's existing children's daycare center, and are not anticipated to affect nearby sensitive receptors. Furthermore, the Modified Project would implement the same operational mitigation measure, as applicable, that was identified for the Original Project. Thus, the modification to the land use mix would not be anticipated to generate significant noise levels at nearby sensitive receptors and would be considered less than significant. In addition, as required by the City's Code, appropriate noise insulation in the design of the residential and hotel buildings would be provided to

reduce the exterior noise level to 45 dBA CNEL within the interior of the buildings. Therefore, the Modified Project would not result in a new significant and unavoidable impact or substantially worsen a previously identified significant impact with respect to operational noise. As such, operational noise impacts under the Modified Project would be within the envelope of impacts identified in the Certified EIR.

The Modified Project proposed improvements along San Pablo Street, Alcazar Street, Eastlake Avenue, Norfolk Street, Biggy Street, Zonal Avenue between San Pablo Street and Biggy Street, and Playground Street and are not forecasted to generate any new daily trips, based on the Project's traffic analysis. However, the traffic on internal roadways is expected to change distribution patterns as a result of the proposed roadway modifications. In particular, the narrowing of San Pablo Street between Alcazar Street and Eastlake Avenue/Norfolk Street is expected to shift a portion of the current traffic (approximately 40 percent) from this roadway segment to the streets on the loop formed by Alcazar Street, Eastlake Avenue, Norfolk Street, and Playground Street.

This change in roadway traffic volumes was analyzed to determine if traffic-related noise impacts would result from Project development. The Project-generated traffic noise impact is determined by comparing the increase in noise levels from the "future without project" to "future with project" conditions against the Project's significance threshold. The incremental significance threshold for both Project-level and cumulative level traffic noise is 3 dBA CNEL. An increase in traffic noise levels of 3 dBA is equivalent to doubling the traffic volume. Traffic volume along Eastlake Avenue from Alcazar Street to San Pablo Street will increase 40 percent, less than the 50 percent required to reach a 3-dBA increase in noise; therefore, off-site traffic noise impacts associated with the Project would be less than significant, and no mitigation measures would be required.[15]

As previously described, Norfolk Street would be extended from its current terminus at Playground Street to a new intersection with Soto Street. An additional evaluation of traffic noise along this new roadway segment was conducted to determine whether the land uses along this segment would be considered consistent with the City guidelines for Noise/ Land Use Compatibility. The new roadway segment would result in 59.9 dBA CNEL at a distance of 50 feet from the right-of-way. Adjacent land uses along this segment include a neighborhood park and a hospital. According to the City guidelines for Noise/Land Use Compatibility, noise from the new roadway segment at these noise receptors would be well within the "normally acceptable" noise level. As a result, land use compatibility impacts with regard to community noise levels would be less than significant, and no mitigation measures would be required.

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[15] *Gibson Transportation Consulting, Inc., Memorandum, Campus Beautification Project, USC Health Sciences Campus, April 30, 2012.*

3. Mitigation Measures

The mitigation measures set forth in the MMRP included in the Certified EIR and provided below remain applicable to the Modified Project. No additional mitigation measures are required due to the development of the Modified Project.

(a) Construction

Mitigation Measure E-1: Prior to the issuance of any grading, excavation, haul route, foundation, or building permits, the Applicant shall provide proof satisfactory to the Building and Safety Department and Planning Department that all construction documents require contractors to comply with Los Angeles Municipal Code Section 41.40 which requires all construction and demolition activity located within 500 feet of a residence to occur between 7:00 A.M. and 6:00 P.M. Monday through Friday and 8:00 A.M. and 6:00 P.M. on Saturday, and that a noise management plan for compliance and verification has been prepared by a monitor retained by the Applicant. At a minimum, the plan shall include the following requirements:

1. Pile drivers used in proximity to sensitive receptors shall be equipped with noise control having a minimum quieting factor of 10 dB(A);
2. Loading and staging areas must be located on site and away from the most noise-sensitive uses surrounding the site as determined by the Department of Building and Safety;
3. Program to maintain all sound-reducing devices and restrictions throughout the construction phases;
4. An approved haul route authorization that avoids noise-sensitive land uses to the maximum extent feasible; and
5. Identification of the noise statutes compliance/verification monitor, including his/her qualifications and telephone number(s).

(b) Operation

Mitigation Measure E-2: If a loading dock/refuse collection area is proposed to be located on Development Site D, the Applicant shall be required to submit evidence, prior to the issuance of building permits for Development Site D, that is satisfactory to the City of Los Angeles Department of Building and Safety that noise level increases do not cause the baseline ambient noise level to increase beyond the 5-dBA significance threshold at any adjacent property line. This mitigation

measure does not apply to development that may occur on Development Sites A, B, C, E, F, and G.

L. Population and Housing

1. Original Project Impacts

Development associated with the Original Project would occur within an urbanized area with existing infrastructure and roadways, and would not result in the extension of roads or major infrastructure. In addition, development associated with the Original Project would occur on sites that do not contain residential uses and none were proposed as part of the Original Project. The Original Project would also not displace existing housing, nor would it displace numbers of people, necessitating the construction of replacement housing elsewhere. While new employment opportunities would be created by the Original Project, most of the expected employees would be drawn from the existing labor force in the region and would not require the need to relocate or place a demand for housing in the area. It is possible that some of the future employees would be new residents of the area; however, it is unlikely that this growth would be substantial in the context of the growth forecasted for the City of Los Angeles. As such, impacts on population and housing associated with the Original Project would be less than significant, and no mitigation measures are necessary.

2. Modified Project Impacts

The Modified Project proposes 185 new graduate student housing units, which would provide a total of 447 beds. For the purposes of this analysis, the number of beds is used as a surrogate for population. As such, the Modified Project would result in a direct population increase of 447 persons. Therefore, the Modified Project would result in an increase in the residential population within and surrounding the HSC compared to the Original Project. However, this direct population growth would be consistent with the SCAG growth forecast for the City of Los Angeles Subregion. Specifically, the Modified Project population would represent approximately 0.011 percent of the 2014 population (4,199,369) forecasted for the City of Los Angeles Subregion.[16,17] In addition, it is anticipated that the new graduate student housing units would primarily be occupied by the existing student population. As such, the Modified Project is not expected to induce substantial population growth, nor exceed the population forecast for the City of Los Angeles. Additionally, to the extent that the Modified Project helps accommodate the

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[16] *SCAG regional growth forecast adopted for the 2008 Regional Transportation Plan Update (www.scag.ca.gov/forecast/index.htm).*

[17] *Based on a straight-line interpolation between 2005 and 2010 values in the SCAG regional growth forecast adopted with the 2008 Regional Transportation Plan Update. The year 2014 represents the anticipated build-out year of the graduate student housing uses.*

anticipated population growth, its population impacts are considered beneficial. Moreover, with the Modified Project's added supply of student housing, development of the Modified Project would have a beneficial impact on the housing market. Thus, impacts on the local population and housing market would be less than significant under the Modified Project. Such impacts would be within the envelope of impacts set forth in the Certified EIR.

M. Public Services

1. Original Project Impacts

(a) Fire

The Los Angeles Fire Department (LAFD) provides fire protection to the Project Site. The nearest LAFD stations are Station 1 at 2230 Pasadena Avenue and Station 2 at 1962 East Cesar Chavez Avenue, both approximately 1 mile from the Project Site. Both stations feature two engine units and one rescue unit. As the distance from either Station 1 or Station 2 to the Project Site is approximately 1 mile, the Project Site is within the LAMC response distance standard. Notwithstanding, educational, medical research and office buildings as well as the parking structure associated with the Original Project would be constructed to include fire safety features such as sprinklers in accordance with LAMC requirements to ensure adequate fire protection. Furthermore, plan check procedures conducted by the City of Los Angeles during the building permit process would identify additional fire safety features in accordance with applicable standards and would identify any needs for additional measures to assure the adequate provision of fire protection services to the Project Site. As such, the Original Project would result in a less than significant impact related to the provision of fire protection, and no mitigation measures are necessary.

(b) Police

The City of Los Angeles Police Department (LAPD) provides police protection to the Project Site and surrounding area. The Project Site is specifically within the Hollenbeck Community Policing area, which encompasses the communities of El Sereno, Lincoln Heights and Boyle Heights. The Hollenbeck Community Police Station is located at 2111 East 1st Street, approximately 1.5 miles south of the Project Site. The Original Project buildings would be designed with security features, such as controlled access and illumination of public and semipublic spaces to minimize opportunities for criminal activity, thereby reducing the demands placed upon police services. In addition, USC maintains a Department of Public Safety to address safety and security concerns on its campuses. These existing services would be extended to include the Original Project. Based on the above, any Original Project impacts on police protection services are expected to be less than significant, and no mitigation measures are necessary.

(c) Schools

The proposed educational and medical research and office buildings on Development Sites A, B and possibly D and the parking structure on Development Site C and also possibly on Development Site D are non-residential in nature and therefore, would not directly generate school-age children. Though it is expected that most of the new employees would be drawn from the existing labor force in the area, the creation of new employment opportunities may induce new residents to the area. However, any potential new employees are expected to be distributed among the region's several municipalities and school districts and are not expected to contribute a significant number of children to any one school. In addition, the Original Project would be subject to the development fees of the Los Angeles Unified School District. Specifically, Senate Bill 50 (SB 50), enacted in 1998, states that the payment of a fee, charge or other levy pursuant to the provisions of Section 17620 of the Education Code is deemed to provide full and complete mitigation for any impact to school facilities. As such, Original Project development would result in a less than significant impact on schools, and no mitigation measures are necessary.

(d) Parks

There are several park and public recreational facilities within the surrounding area, most notably Hazard Park and Lincoln Park, located southeast and north of the Project Site, respectively. Lincoln Park is located north of Valley Boulevard. The proposed educational, medical research and medical office buildings on Development Sites A, B and possibly D, and the parking structure on Development Site C and also possibly on Development Site D are non-residential in nature. Employees of these buildings are not expected to make significant use of the nearby parks as the majority of the recreational needs of Project-related employees would be met by park facilities near their place of residence or by regional park facilities. In addition, the residences of potential new employees are expected to be distributed among several municipalities and are not expected to result in a significant increase in demand for parks in any specific city, community or neighborhood. Therefore, the Original Project's impacts on parks would be less than significant, and no mitigation measures are necessary.

(e) Libraries and Other Public Services

Other public facilities that would serve the Original Project include libraries, roads and transit, utility systems such as water and sewer infrastructure, as well as other general public facilities. The Original Project is part of an educational and medical campus. The Project is non-residential in nature and most of the expected employees would be drawn from the existing labor force in the region. As such, the Original Project would not directly generate any other new demand for public facilities. Therefore, impacts to other governmental services would be less than significant, and no mitigation measures are necessary.

2. Modified Project Impacts

(a) Fire

The Modified Project's development of graduate student housing units would increase the residential service population of Fire Stations 1 and 2 and would potentially increase the demand for fire protection services as provided by these stations. However, it is anticipated that the new graduate student housing units would be occupied by the existing student population already present within the campus. Therefore, the activity levels under the Modified Project, compared to the Original Project, would represent a minor increase in the overall population served by the fire stations in proximity of the Project Site. Additionally, though the fire fighting resources of Station 1 have been reduced to one engine unit and one rescue unit,[18] compared to what was provided in the Original project, the fire fighting resources of Station 2 have increased to three engine units and one rescue unit.[19] In addition, as with the Original Project, the Modified Project would include any fire safety features in accordance with LAMC requirements and as required by the City during the normal building permit process to provide for the adequate provision of fire protection services to the Project Site. Therefore, sufficient fire fighting and paramedic resources are anticipated to be available to meet the minor increased demand attributable to the Modified Project. Furthermore, as the type and intensity of uses proposed under the Modified Project were specifically developed within the remaining trip generation of the Certified EIR, the volume and distribution of traffic under the Modified Project would be comparable to the Original Project. Thus, the Modified Project would not interfere with emergency vehicle access to the Project Site. Additionally, as set forth in the memorandum from the Los Angeles Fire Department included as Appendix F, the Los Angeles Fire Department has determined that no significant impacts with respect to emergency access or fire protection services would occur as a result of the Modified Project.

Based on the above, the Modified Project would not create any new impacts with respect to fire protection services nor increase the severity of any previously identified impacts. Therefore, impacts on fire protection services would be less than significant and within the envelope of impacts identified in the Certified EIR.

(b) Police

The LAPD utilizes an area's resident population to determine service needs, in the form of an officer-to-resident ratio. As the Modified Project would involve a change in the land use mix of the Original Project and develop new graduate student housing units, the

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[18] *Personal communication with Captain Ponce of Station 1. April 10, 2012.*

[19] *Personal communication with Captain George Perez of Station 2. April 11, 2012.*

Modified Project would increase the residential population and potentially increase the demand for police protection services over the Original Project. However, it is anticipated that the new graduate student housing units would be occupied by the existing student population that would already be present within the campus. Furthermore, the Modified Project would implement the same security features identified for the Original Project and the USC Department of Public Safety would continue to address safety and security concerns within the HSC. Therefore, any impacts on police protection services associated with the Modified Project are expected to be less than significant. Such impacts would be within the envelope of impacts identified in the Certified EIR.

(c) Schools

The Modified Project would result in a direct increase in the residential population and an associated increase in the demand for schools within the Los Angeles Unified District service area. However, development of the Modified Project would be subject to the school fees required by Government Code Section 65995. The payment of these development fees constitutes full mitigation of school impacts, and thus impacts under the Original Project would be less than significant. Such impacts on schools would be within the envelope of impacts identified in the Certified EIR.

(d) Parks

The demand for parks and recreational services is primarily the function of the amount of residential development in an area, as an area's residents are considered the primary users of parks and recreation facilities. Therefore, the Modified Project's new student housing population of approximately 447 persons is anticipated to result in some increased use of the nearby Lincoln and Hazard Parks and other existing neighborhood, community, and regional parks. The Modified Project would provide open-space areas and recreational amenities as part of development of the new student housing units. In addition, the student housing component would satisfy the City's open space requirements as set forth in the LAMC. Accordingly, the Modified Project is not anticipated to result in significant impacts to parks and such impacts would be within the envelope of impacts set forth in the Certified EIR.

(e) Libraries and Other Public Services

Library services within the Project area are provided by the City of Los Angeles Public Library (LAPL) and also within the HSC. The closest public libraries to the Project Site are the Malabar Library located at 2801 Wabash Avenue, Benjamin Franklin Library located at 2200 East 1st Street, and the Lincoln Heights Library located at 2530 Workman

Street, all approximately 1 mile from the Project Site.[20] As the Modified Project would result in an increase in the residential population, the Modified Project would generate a direct increase in the demand for library services. However, as the proposed new graduate student housing units would be occupied primarily by the existing student population already present within the campus, the actual demand on library resources for professional daytime use by Modified Project residents would be minimal, particularly since student research needs are commonly met by in-house or on-line reference resources. Therefore, the Modified Project would result in less than significant impacts on library facilities and such impacts would be within the envelope of impacts identified in the Certified EIR.

N. Recreation

1. Original Project Impacts

There are several park and public recreational facilities within the surrounding area, most notably Hazard Park and Lincoln Park. The Original Project does not propose residential uses, which could create a direct demand for parks and recreational facilities. While new employment opportunities would be provided by the Original Project, these employees are not expected to make significant use of the nearby parks. In addition, the majority of the recreational needs of employees would be met by park facilities near their place of residence or by regional park facilities. As the residences of potential new employees are expected to be distributed among several municipalities, use of parks and other recreational facilities by potential new employees is not expected to result in a significant increase in demand for parks in any specific city, community or neighborhood. Therefore, potential impacts to parks or other recreational facilities resulting from the Project would be less than significant, and no mitigation measures are necessary.

2. Modified Project Impacts

The demand for parks and recreational services generated by a project is primarily a function of the amount of residential development that is being proposed. Therefore, the Modified Project's new residential population associated with the proposed 185-unit graduate student housing component would result in an increase in the residential population, which could result in a corresponding increase in the use of the nearby Lincoln and Hazard Parks and other existing neighborhood, community, and regional parks and recreational facilities. However, it is anticipated that the new graduate student housing units would be occupied by the existing student population present within the campus, which may already use nearby recreational facilities. Furthermore, the Modified Project would satisfy the City's open space requirements as set forth in the LAMC. Thus, the

[20] *Los Angeles Public Library, Find a Library Near You, Selection for "90033," www.lapl.org/maps/branch_googlemap.php?zipcode=90033, accessed March 27, 2012.*

Modified Project would not substantially increase the use of off-site neighborhood and regional parks and recreational facilities, nor would it substantially increase demand for recreation programs. Modified Project impacts on recreation facilities would be less than significant. Such impacts would be within the envelope of impacts set forth in the Certified EIR.

O. Traffic, Circulation, and Parking

1. Original Project Impacts

(a) Construction

Depending upon the specific nature of the construction activity (e.g., demolition, excavation, or concrete pouring), it was assumed that the majority of truck traffic would be distributed evenly across the workday and thus would not significantly interfere with HSC traffic patterns. In addition, any temporary lane closures during construction would normally be limited to between 9:00 A.M. and 3:00 P.M. In the event temporary lane closures are required, flag men would be used to control traffic movement during ingress or egress of trucks and heavy equipment from the construction site. As such, though Original Project construction may create a temporary inconvenience to auto travelers, bus riders, and pedestrians, with the required haul route approval and implementation of general construction management practices and specific project design features, Original Project traffic impacts during construction would be less than significant.

(b) Operation

In order to identify streets and intersections most likely to be impacted by Original Project traffic, the following 18 study intersections in the Project vicinity were identified in consultation with the LADOT. In addition, pursuant to LADOT's traffic study guidelines, Level of Service calculations were prepared for six scenarios. A summary of the potential Original Project traffic impacts for each scenario is provided further below.

1. I-5 Freeway Southbound (SB) Off-Ramp and Avenue 21-Main Street
2. I-5 Freeway SB Ramps and Mission Road
3. I-5 Freeway Northbound (NB) Off-Ramp and Daly Street-Main Street
4. Daly Street and Main Street
5. Mission Road and Daly Street-Marengo Street
6. I-5 Freeway NB On-Ramp and Marengo Street

7. Mission Road and Griffin Avenue-Zonal Avenue
8. Mission Road and Valley Boulevard
9. Mission Road and Main Street
10. Biggy Street and Zonal Avenue
11. San Pablo Street and Valley Boulevard
12. San Pablo Street and Alcazar Street
13. San Pablo Street and Eastlake Avenue-Norfolk Street
14. San Pablo Street and Zonal Avenue
15. Soto Street and Alcazar Street
16. Soto Street and I-10 Freeway Westbound (WB) Ramps-Charlotte Street
17. Soto Street and Marengo Street
18. Soto Street and I-10 Freeway Eastbound (EB) Off-Ramp-Wabash Avenue

(1) Traffic

Under a program consisting of 120,000 square feet of medical clinic facilities and 465,000 square feet of academic and medical research space, the Original Project is expected to generate 753 vehicle trips (613 inbound trips and 140 outbound trips) during the A.M. peak hour. During the P.M. peak hour, the Original Project is expected to generate 774 vehicle trips (161 inbound trips and 613 outbound trips). Over a 24-hour period, the Original Project is forecast to generate 7,715 daily trips during a typical weekday.

Existing Conditions

Under the Certified EIR existing conditions, 16 of the 18 study intersections were operating at LOS D or better during both the A.M. and P.M. peak commuter hours. The remaining two intersections (Intersections 2 and 16) were noted to be operating at LOS E during the A.M. peak hour only.

Future Plus Project Conditions

With the addition of ambient growth traffic, 15 of the 18 study intersections are expected to continue operating at LOS D or better during both the A.M. and P.M. peak commuter hours, except for: Intersection 2 (LOS F during the A.M. peak hour);

Intersection 5 (LOS E during the P.M. peak hour); and Intersection 16 (LOS F during the A.M. peak hour and LOS E during the P.M. peak hour).

Future with Related Projects

With the addition of ambient growth traffic and the traffic due to the related projects, 14 of the 18 study intersections are forecasted to operate at LOS D or better during both the A.M. and P.M. peak commuter hours, except for: Intersection 2 (LOS F during the A.M. peak hour); Intersection 5 (LOS E during the A.M. and P.M. peak hour); Intersection 16 (LOS F during the A.M. and P.M. peak hour); and Intersection 17 (LOS E during the P.M. peak hour).

Future with Parking Scenario Nos. 1 and 2

In order to provide a conservative analysis of the Original Project's potential traffic impacts, two parking scenarios were developed that reflect the greatest concentration of Original Project-related traffic on the local roadway system. Parking Scenario No. 1 assumes that parking for the Original Project would be provided entirely within Development Site C. Parking Scenario No. 2 assumes that parking for the Original Project would be provided entirely within Development Site E or in combination of Development Sites E and F. Under these assumptions, 11 of the 18 study intersections would be significantly impacted by the development of the Original Project under both parking scenarios. Nine of the 11 impacted intersections would be the same intersections under both parking scenarios. These nine intersections, which would be impacted under both parking scenarios include Intersections 2, 3, 5, 6, 12, 14, 16, 17, and 18. In addition, Intersections 7 and 10 would be impacted under Parking Scenario No. 1 and Intersections 8 and 15 would be impacted under Parking Scenario No. 2.

Other Potential Traffic Impacts

Project impacts with regard to facilities under the jurisdiction of the Los Angeles County Congestion Management Plan would be less than significant. In addition, with regard to the Union Pacific crossing on San Pablo Street, south of Valley Boulevard, it is conservatively concluded that a potentially significant impact could occur during the periods of time when traffic is diverted due to train(s) blocking San Pablo Street. This potential impact would be temporary in nature and would be alleviated once San Pablo Street is available as a through traffic route.

Traffic Impacts with Implementation of Mitigation Measures

After implementation of the Parking Scenario No. 1 mitigation measures provided below, impacts at seven of the 11 significantly impacted intersections would be reduced to a less than significant level. In addition, no feasible mitigation measures are available to

reduce the traffic impacts to a less than significant level at three of the remaining four intersections. The three intersections include Intersections 5, 7, and 16. Impacts at the fourth location, Intersection 17, may be reduced to a less than significant level with implementation of the applicable mitigation measure. However, as formal approval of the proposed improvements was not provided, the Certified EIR conservatively concluded that Original Project development would result in a significant traffic impact at Intersection 17.

With implementation of Parking Scenario No. 2 mitigation measures, impacts at eight of the 11 significantly impacted intersections would be reduced to a less than significant level. No feasible mitigation measures are available to reduce the traffic impacts to a less than significant level at two of the remaining three intersections. These two intersections include Intersections 8 and 5. Impacts at the third location, Intersection 17, would be the same as identified above under Parking Scenario No. 1.

As discussed above, trains currently slow or stop at the existing at-grade Union Pacific Railroad crossing immediately south of Valley Boulevard, causing vehicle queuing and occasionally rerouting of local traffic. An existing Public Utilities Commission ordinance limits the duration that trains can block at-grade crossings. However, enforcement of this ordinance is outside the authority of decision-makers associated with the Original Project. Thus, absent either enforcement of the PUC ordinance or a relocation of the train stoppage point, the Original Project would potentially contribute to an existing significant impact.

(2) Access

With regard to access, the intersections that provide access to the Project Site are projected to operate at LOS D or better under the future cumulative analysis conditions (i.e., future with Original Project and Original Project mitigation conditions). Thus, Original Project development would result in a less than significant access impact.

(3) Parking

A net increase of 2,072 parking spaces is calculated for future parking facilities under both Parking Scenario No. 1 and Parking Scenario No. 2. As described above, under Parking Scenario No. 1, parking would be provided only on Development Site C, and under Parking Scenario No. 2, parking would be provided in Development Site E or in a combination of Development Sites E and F. The net increase of 2,072 would exceed the Code requirement of 1,423 to 1,548 spaces, depending on the future mix of developed land uses. The future parking supply for the USC Health Sciences Campus would increase to approximately 5,870 spaces (i.e., 3,798 existing + 2,072 net future = 5,870 spaces). Thus, the future parking supply of 5,870 spaces is anticipated to satisfy the Original Project's future Code parking requirement. In addition, based on a peak existing parking demand of

3,132 spaces and a future peak demand of up to approximately 1,985 spaces, a total future peak parking demand of 5,117 spaces (3,132 + 1,985 = 5,117 spaces) would result. Therefore, as the available parking supply would exceed the HSC's future parking demand, parking impacts would be less than significant.

2. Modified Project Impacts

(a) Construction

Traffic and access impacts during construction of the Modified Project are anticipated to be similar to those described above for the Original Project. Specifically, as with the Original Project, it is anticipated that any trucks/construction equipment needed for construction of the Modified Project would be brought on the Project Site and be stored within the perimeter fence of the designated construction site. Thus, no staging of equipment is expected to occur on the perimeter public streets. In addition, as with the Original Project, the number of trucks hauling any export materials would be distributed throughout the duration of construction so as to minimize the number of haul trucks per day. Furthermore, similar to the Original Project, in the event of any temporary lane or sidewalk closures, flagmen would be used to control traffic movement during ingress or egress of trucks and heavy equipment from the construction site. Additionally, as with the Original Project, the Modified Project would prepare a Truck Haul Route program as part of the City's permitting process, which will be submitted to the City for review and approval prior to the issuance of a building permit. In addition, in order to minimize potential conflicts between construction activity and through traffic, the Modified Project would include a project design feature requiring a Construction Management Plan to be implemented during construction. Features of the Construction Management Plan may include: limiting potential lane closures to off-peak travel periods, to the extent feasible; maintaining existing access for adjacent uses; prohibiting parking by construction workers on adjacent streets and directing construction workers to utilize on-site or other HSC-designated parking areas; scheduling receipt of construction materials during non-peak travel periods, to the extent feasible; and complying with approved construction traffic control plans that identify traffic control measures, signs, delineators, etc., to be implemented by the construction contractor throughout the duration of construction. With implementation of the Truck Haul Route program, the Construction Management Plan, the off-peak arrival and departure of construction-related trips, and other construction management practices described above, construction traffic impacts would be less than significant under the Modified Project. Such impacts would be within the envelope of impacts addressed in the Certified EIR.

(b) Operation

To evaluate whether the proposed modifications to the Original Project would result in potential traffic impacts, Gibson Transportation Consulting, Inc. reviewed potential traffic conditions associated with the Modified Project as part of the Traffic Memorandum

summarized below and included as Appendix D. A memorandum from the Los Angeles Department of Transportation regarding the proposed modifications is provided as Appendix G. As set forth therein, the specific design details associated with the proposed improvements related to roadway striping, crosswalks, turning radii, and installation of traffic control devices would be subject to review and approval by the Los Angeles Department of Transportation's design staff as part of the Bureau of Engineering's B-permit process.

(1) Traffic

As previously described, since preparation of the Certified EIR, the 62,500 square foot Broad Center has been completed and is currently in operation. In addition, the 102,600 square foot HCC III, which includes 92,700 square feet of medical clinic facilities and 9,900 square feet of non-clinical facilities has been proposed and is currently in the site plan review process. Using the same methodology, assumptions, and trip generation rates from the Certified EIR, these two development components are expected to generate a total of 4,096 daily trips, including a total of 300 A.M. and 350 P.M. peak-hour trips. As provided above, the Original Project was anticipated to generate 753 A.M. and 774 P.M. peak-hour trips and a total of 7,715 daily trips. Thus, when accounting for the A.M. and P.M. peak-hour trips generated by these two projects, the number of remaining peak-hour trips available for the Modified Project within the trip envelope analyzed in the Certified EIR would be 453 A.M. and 424 P.M. peak-hour trips or approximately 55 percent of the trip generation forecasted for the Original Project. These remaining peak-hour trips are used in the analysis below to determine whether the development proposed under the Modified Project would be within the peak-hour trips set forth in the Certified EIR.

Additionally, as also described above, other improvement projects currently underway within the HSC include the Los Angeles Department of Water and Power Utilities Project, which involves the undergrounding of all existing overhead communication and energy transmission lines within the HSC; the Norfolk Street extension; and modifications to the in-patient and out-patient circulation system. As previously described, with the Norfolk Street extension, Norfolk Street will be extended from its current eastern terminus at Playground Street to a new intersection with Soto Street. This will provide an additional major access point to the HSC and will be designated as the primary entrance for hospital in-patient visitors. It is anticipated that upon completion of the Norfolk Street extension, 40 percent of the traffic currently entering the HSC via Alcazar Street and 20 percent of the traffic currently entering the HSC via San Pablo Street at Zonal Avenue would shift from those access points to the new gateway at Norfolk Street and Soto Street. Additionally, as part of the modifications to the in-patient and out-patient circulation, use of San Pablo Street between Alcazar Street and Eastlake Avenue/Norfolk Street as an access point would be reduced. While these projects are not a part of the Modified Project, they are described here as they are currently anticipated to be completed and in operation at

buildout of the Modified Project. In addition, the Norfolk Street extension and the modifications to the in-patient and out-patient circulation system, in particular, would modify existing circulation patterns within the HSC. These modifications are accounted for in the traffic analysis provided below.

Modified Project Traffic

Trip generation forecasts for the Modified Project were prepared for each of the four development options described above in Section III, Project Description, based on the same methodology, trip generation rates of the academic and medical-related facilities, and assumptions used in the Certified EIR.[21] Trip generation rates for the proposed student housing and hotel components were based on the Institute of Transportation Engineers Trip Generation, 8th Edition. Consistent with the Certified EIR, the trip generation forecasts include adjustments for internal capture to account for the synergy between the existing HSC and land uses proposed under the Modified Project. It should be noted that the trip generation estimates are conservative as trip reductions from travel demand management program measures (i.e., USC sponsored shuttles, carpooling programs, transit subsidies, etc.) or transit were not considered. Based on these assumptions, the Traffic Memorandum determined that Option 1 would generate the greatest number of A.M. peak-hour trips, while Option 4 would generate the greatest number of P.M. peak-hour trips. Specifically, Option 1 is forecast to generate a total of 426 net new trips during the weekday A.M. peak hour and Option 4 is forecast to generate 423 P.M. peak-hour trips. Therefore, even when accounting for the most conservative development options, the number of trips under the Modified Project would be below the 453 A.M. and 424 P.M. remaining peak-hour trips entitled for the Modified Project.

It should also be noted that the peak-hour trip generation directional distribution (i.e., inbound and outbound trips) for the Modified Project would be slightly different than the Original Project trip generation. This difference is likely due to the incorporation of the proposed graduate student housing and hotel land uses as compared to development of only medical clinical and research and development uses under the Original Project. The residential-related inbound and outbound trips are such that they would operate counter to the dominant flow of traffic to the campus (i.e., the medical clinical and research and development uses). For example, medical clinic-related traffic would be an inbound during the morning peak hour and outbound during the afternoon peak hour, whereas the student housing traffic would be the opposite with outbound trips during the morning peak hour and

[21] *As indicated in the Traffic Assessment, the year 2010 traffic volumes for most of the selected intersections are consistently lower than the year 2004 traffic volumes during the morning and afternoon peak hours. The higher 2004 traffic volumes contained in the Certified EIR suggest that the ambient traffic growth and projected related projects traffic volumes were overestimated. As such, use of the 2004 traffic count data and associated forecast traffic volumes in the Traffic Assessment is valid and results in a conservative analysis of traffic impacts.*

inbound trips during the afternoon peak hour. Regardless, the small number of trips would be distributed throughout the campus and gateways, resulting in a dissipation of traffic at the study intersections. As such, the differences in directional distribution are not anticipated to result in significant impacts at the study intersections based on a review of the level of service (LOS) and increases in the Critical Movement Analysis (CMA) values shown in the Certified EIR.

As the Modified Project also proposes modifications along the majority of the internal roadways, the Traffic Memorandum also included an analysis of the ability of the new roadway configuration to handle the expected traffic levels. This is assessed by calculating the volume-to-capacity (V/C) ratio. As described in the Traffic Memorandum, the V/C ratio is determined by dividing the 24-hour traffic volume by the roadway capacity. The V/C ratio is then used to assess the LOS of the roadway on a scale from LOS A, representing nearly free-flow conditions, to LOS F, representing over-capacity conditions. As previously described, as part of the Modified Project, the majority of the internal HSC roadways would be reclassified to facilitate an orderly traffic circulation pattern around the core of the HSC and minimize pedestrian/vehicular conflicts. In particular, San Pablo Street would be deemphasized, especially between Alcazar Street and Eastlake Avenue/Norfolk Street in order to discourage automobile traffic through the center of the campus. With implementation of the proposed roadway modifications, the distribution pattern of traffic on internal roadways is expected to change. Specifically, the narrowing of San Pablo Street between Alcazar Street and Eastlake Avenue/Norfolk Street would deter many motorists from using this stretch of road and encourage drivers to circulate the roadway system via the loop formed by Alcazar Street, Eastlake Avenue, Norfolk Street, and Playground Street. While the Modified Project would result in a redistribution of traffic within the HSC, the Modified Project would continue to be within the remaining peak-hour trips for the Campus identified in the Certified EIR. In addition, as most roadways would maintain the same number of lanes compared to existing conditions,[22] the Modified Project would not exceed existing roadway capacities.

Future Roadway Conditions with Implementation of the Project

As described further in the Traffic Memorandum, in order to ensure that the proposed roadway modifications would provide sufficient capacity to serve the long-term growth of the HSC and other facilities adjacent to HSC, an analysis of future conditions was

[22] *As previously noted, Table 13 of the Traffic Memorandum provided in Appendix D demonstrates that the existing number of lanes would be maintained along most roadway segments, with the exception of the roadway segment at Alcazar Street from San Pablo Street to Playground Street, which would include an additional eastbound traffic lane. Also shown in Table 13 of the Traffic Memorandum, roadway capacities would generally be maintained or increased with the exception of the roadway segment at San Pablo Street from Alcazar Street to Eastlake Avenue/Norfolk Street, which would be reduced due to the removal of the center turn lane separating the northbound and southbound lanes.*

also conducted. The future conditions analysis was conservatively based on a 30-year horizon with 3 percent compounding traffic growth each year, for a total of 142 percent growth. The resulting future traffic conditions (with and without the proposed roadway modifications) analysis is provided in Table 14 of the Traffic Memorandum. As provided therein, under future conditions (without the proposed roadway modifications) all roadway segments would operate at an LOS A with the exception of Norfolk Street (between San Pablo Street and Playground Street), which is expected to operate at an LOS D. As shown in Table 14 of the Traffic Memorandum, with the modified roadway classification and dimensions proposed as part of the Modified Project, all of the street segments are anticipated to continue to operate at an LOS A, with the exception of Norfolk Street, which would be improved to a LOS C and LOS B in the eastbound and westbound directions, respectively. Future operations along Alcazar Street from San Pablo Street to Playground Street are also anticipated to improve with the Modified Project.

Conclusion

Based on the above, it is concluded that any of the Modified Project options could be developed within the trip generation analyzed in the Certified EIR. In addition, it is noted that the Modified Project in combination with the trips generated by the Broad Center and the HCC III would result in fewer P.M. peak-hour trips than analyzed in the Certified EIR. Furthermore, existing and future traffic volumes would be accommodated within the proposed roadway classifications and capacities. As such, development of the Modified Project would not alter the conclusions nor result in any additional impacts or cause a substantial increase in the severity of the traffic impacts of the Certified EIR. As such, traffic impacts associated with the Modified Project would be within the envelope of traffic impacts addressed in the Certified EIR.

(2) Access

Access to the graduate student housing and hotel site is planned to be provided via San Pablo Street and shared with the driveway to the surface parking lot. Access to HCC III and HCC IV is planned to be provided via driveways along Alcazar Street. As indicated above, the Modified Project is not anticipated to result in significant impacts at the study intersections. Therefore, as with the Original Project, access impacts under the Modified Project would also be less than significant. Such impacts would be within the envelope of impact set forth in the Certified EIR.

(3) Parking

Parking associated with the Modified Project would be provided such that the total parking requirements for the land uses within the HSC would be satisfied within the total parking supply at the HSC. Therefore, similar to the Original Project, as there would be

parking available within the HSC to meet the anticipated parking demand, parking impacts under the Modified Project would also be less than significant. Such impacts would be within the envelope of impacts addressed in the Certified EIR.

3. Mitigation Measures

A traffic mitigation sequencing program was established and outlined in the LADOT assessment letter. Some of the mitigation measures have been completed and several others are underway, as indicated where appropriate below. The balance of the mitigation measures remains applicable to the Modified Project. No additional mitigation measures are required due to the development of the Modified Project.

(a) Parking Scenario No. 1

Mitigation Measure C-1: **Intersection No. 2: I-5 Freeway SB and Mission Road**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 1 during the A.M. and P.M. peak commuter hours. Mitigation for this intersection consists of widening the southbound off-ramp to provide an additional lane. The off-ramp would provide one left-turn only lane, one combination left-turn/through lane and one right-turn only lane. A traffic signal modification would also be required.

[This mitigation measure set forth in the MMRP and included in the Certified EIR is underway.]

Mitigation Measure C-2: **Intersection No. 3: I-5 Freeway NB Off-Ramp and Daly Street–Main Street**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 1 during the A.M. peak commuter hour. Mitigation for this intersection consists of the installation of a traffic signal at this location.

Mitigation Measure C-3: **Intersection No. 6: I-5 Freeway NB On-Ramp and Marengo Street**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 1 during the P.M. peak commuter hour. Mitigation for this intersection consists of the installation of an eastbound right-turn only lane. This measure will involve a lengthening of the red curb along the south side of Marengo Street west of the on-ramp.

Mitigation Measure C-4: **Intersection No. 10: Biggy Street and Zonal Avenue**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 1 during both the A.M. and P.M. peak commuter hours. Mitigation for this intersection consists of restriping the southbound approach to provide one left-through lane and one right-turn only lane and restriping the eastbound approach to provide one left-turn lane and one optional through/right-turn only lane.

Mitigation Measure C-5: **Intersection No. 12: San Pablo Street and Alcazar Street**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 1 during the A.M. peak commuter hour. Mitigation for this intersection consists of the installation of a traffic signal at the location. Traffic signal warrant analyses have been completed for the intersection.

[This mitigation measure set forth in the MMRP and included in the Certified EIR is underway.]

Mitigation Measure C-6: **Intersection No. 14: San Pablo Street and Zonal Avenue**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 1 during the P.M. peak commuter hour. Mitigation for this intersection consists of installation of a traffic signal at this location.

Mitigation Measure C-7: **Intersection No. 16: Soto Street and I-10 Freeway WB Ramps–Charlotte Street**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 1 during both the A.M. and P.M. peak commuter hours. Partial mitigation for this intersection consists of the previously City reviewed and approved mitigation measure associated with the HNRT project. The previously reviewed and approved mitigation measure involves the widening of the I-10 Freeway Westbound Off-ramp to provide an additional right-turn only lane. The Preliminary Engineering Evaluation Report document is currently in preparation and will be submitted to the California Department of Transportation for review.

[This mitigation measure set forth in the MMRP and included in the Certified EIR has been completed.]

Mitigation Measure C-8: **Intersection No. 17: Soto Street and Marengo Street**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 1 during both the A.M. and P.M. commuter peak hours. Mitigation for this intersection consists of the removal of the raised median islands on Soto Street, north and south of Marengo Street, restriping the northbound and southbound approaches to provide dual left-turn lanes, two through lanes and one combination through/right-turn lane, as well as a traffic signal modification. This measure has only received conceptual approval at this time.

Mitigation Measure C-9: **Intersection No. 18: Soto Street and I-10 Freeway EB Off-Ramp–Wabash Avenue**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 1 during the A.M. peak commuter hour. Mitigation for this intersection consists of restriping Soto Street, south of Wabash Avenue, within the existing roadway pavement width, to provide an additional northbound through lane.

(b) Parking Scenario No. 2

Mitigation Measure C-10: **Intersection No. 2: I-5 Freeway SB and Mission Road**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 2 during the A.M. and P.M. peak commuter hours. The aforementioned traffic mitigation measure recommended for Parking Scenario No. 1 for the I-5 Freeway SB and Mission Road intersection also would be applicable to Parking Scenario No. 2.

Mitigation Measure C-11: No. 3: I-5 Freeway NB Off-Ramp and Daly Street–Main Street—The intersection is anticipated to be significantly impacted by Parking Scenario No. 2 during the A.M. peak commuter hour. The aforementioned traffic mitigation measure recommended for Parking Scenario No. 1 for the I-5 Freeway NB Off-Ramp and Daly Street-Main Street intersection also would be applicable to Parking Scenario No. 2.

Mitigation Measure C-12: Intersection No. 6: I-5 Freeway NB On-Ramp and Marengo Street—The intersection is anticipated to be significantly impacted by Parking Scenario No. 2 during the P.M. peak commuter hour. The aforementioned traffic mitigation measure recommended for Parking Scenario No. 1 for the I-5 Freeway NB On-Ramp and Marengo Street intersection also would be applicable to Parking Scenario No. 2.

Mitigation Measure C-13: **Intersection No. 12: San Pablo Street and Alcazar Street**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 2 during the A.M. and P.M. peak commuter hours. The aforementioned traffic mitigation measure recommended for the Parking Scenario No. 1 for the San Pablo Street and Alcazar Street intersection also would be applicable to Parking Scenario No. 2.

Mitigation Measure C-14: Intersection No. 14: San Pablo Street and Zonal Avenue—The intersection is anticipated to be significantly impacted by Parking Scenario No. 2 during the P.M. peak commuter hour. The aforementioned traffic mitigation measure recommended for Parking Scenario No. 1 for the San Pablo Street and Zonal Avenue intersection also would be applicable to Parking Scenario No. 2.

Mitigation Measure C-15: Intersection No. 15: Soto Street and Alcazar Street—The intersection is anticipated to be significantly impacted by Parking Scenario No. 2 during the A.M. and P.M. peak commuter hours. Mitigation for this intersection includes the installation of a second northbound left–turn lane and widening along the south side of Alcazar Street, west of Soto Street, to provide a fourth eastbound approach lane (i.e., the eastbound approach would provide one left-turn lane, one combination left-through lane and two right-turn only lanes). A traffic signal modification would also be required.

[This mitigation measure set forth in the MMRP and included in the Certified EIR has been completed.]

Mitigation Measure C-16: **Intersection No. 16: Soto Street and I-10 Freeway WB Ramps—Charlotte Street**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 2 during both the A.M. and P.M. peak commuter hours. The aforementioned traffic mitigation measure recommended for Parking Scenario No. 1 for the Soto Street and I-10 Freeway WB Ramps-Charlotte Street intersection also would be applicable to Parking Scenario No. 2.

Mitigation Measure C-17: **Intersection No. 17: Soto Street and Marengo Street**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 2 during both the A.M. and P.M. commuter peak hours. The aforementioned traffic mitigation measure recommended for Parking Scenario No. 1 for the Soto Street and Marengo Street intersection also would be applicable to Parking Scenario No. 2. This measure has only received conceptual approval at this time.

Mitigation Measure C-18: **Intersection No. 18: Soto Street and I-10 Freeway EB Off-Ramp–Wabash Avenue**—The intersection is anticipated to be significantly impacted by Parking Scenario No. 2 during the A.M. peak commuter hour. Mitigation for this intersection consists of restriping Soto Street, south of Wabash Avenue, within the existing roadway pavement width, to provide an additional northbound through lane.

P. Utilities/Service Systems

1. Original Project Impacts

(a) Water

The majority of water use during construction would be associated with dust suppression of excavated sites. This is generally performed by water trucks which derive non-potable water from off-site sources. As such, the impact on treated water from the Los Angeles Department of Water and Power (LADWP) and on adjacent water conveyance systems would be incrementally small. The Original Project would also require construction of water lines from each Development Site for domestic water and for fire sprinkler and suppression systems. Impacts due to construction of water services include minor temporary traffic lane disruption during trenching, laying of pipe, backfilling, and street resurfacing. Standard practices and procedures, including traffic control, are generally implemented by LADWP during construction to reduce the impact to the community. As such, no significant impact to water resources is anticipated to occur during construction of the Original Project and no mitigation measures are necessary.

Operation of the Original Project is anticipated to consume an estimated total of 208,704 to 266,304 gallons per day (gpd) of potable water during the day in which the Original Project is fully occupied at buildout. Conservatively assuming the average daily demand for water is extended over 365 days per year, the projected annual consumption for the entire project at buildout would be a maximum of 97.20 million gallons annually. This represents an increase of 0.04 percent over the annual volume of water supplied by the LADWP in fiscal year 2004. In addition, LADWP has concluded via the Original Project's WSA that adequate water supplies exist to serve the maximum proposed development. Therefore, the water demand of the Original Project would be less than significant in relation to the Urban Water Management Plan and with state water statutes. In addition, the Original Project would not exceed distribution infrastructure capabilities or create a significant impact relative to the existing conveyance system. Furthermore, fire flow would be adequate to meet LAFD requirements. Therefore, the Original Project would generate a less than significant impact in relation to water supply and water conveyance systems.

(b) Sewer

During construction, a negligible amount of wastewater would be generated by construction personnel. It is anticipated that portable toilets would be provided by a private company and the waste disposed of off-site. Wastewater generation from construction activities is not anticipated to cause a measurable increase in wastewater flows at a time when a sewer's capacity is already constrained or that would cause a sewer's capacity to become constrained. Additionally, construction is not anticipated to generate wastewater flows that would substantially or incrementally exceed the future scheduled capacity of any treatment plant by generating flows greater than those anticipated in the City Wastewater Facilities Plan. Furthermore, impacts due to construction of lateral lines from the Development Sites to the sewer lines in the public right-of-way would be limited to minor traffic lane disruption. Standard practices and procedures, including traffic control, would be implemented to reduce the impact to the community. Therefore, construction impacts to the local wastewater conveyance and treatment system would be less than significant and no mitigation is required.

Anticipated sewage flow for the Original Project at buildout would range from 163,050 to 208,050 gallons per day. The regional wastewater treatment facility at the Hyperion Treatment Plant (HTP) has been improved to provide capacity for the incremental increase in sewage generated by anticipated growth in the City of Los Angeles. In addition, all projects served by the Hyperion Treatment System are subject to the Sewer Allocation program, which limits additional discharge according to a pre-established percentage rate. If the allotment for a particular time period (usually a month) has already been allocated, the project is placed on a waiting list until adequate treatment capacity has been determined. Under the allocation program, HTP has capacity to serve a particular rate of

growth. Since the Project Site is located in an area designated for commercial and public facility uses, the Original Project's additional wastewater flows would not substantially or incrementally exceed the future scheduled capacity of the HTP by generating flows greater than those anticipated in the Wastewater Facilities Plan or City General Plan. Furthermore, the Applicant would be subject to the payment of a sewerage facilities charge for the development at the Health Sciences Campus. Based on the preceding, no significant impacts in relation to treatment capacity would occur.

The sewer conveyance system serving the Development Sites includes sewer lines in Eastlake Avenue, San Pablo Street, Alcazar Street, Biggy Street, and Zonal Avenue. Since all sewer lines serving the Development Sites have adequate capacity to serve the maximum projected flow from each of the Development Sites, Original Project impacts relative to sewer line capacity is concluded to be less than significant.

(c) Solid Waste

The disposal of solid waste generated within the City of Los Angeles, as well as throughout all of Los Angeles County, is a shared responsibility of the County of Los Angeles, the cities within Los Angeles County, County Sanitation Districts, private industry, and other stakeholders. A total of approximately 23.8 million tons of solid waste was generated throughout Los Angeles County in 2003. This total is forecasted to increase to 27.5 million tons in 2015. The 2003 Annual Report to the Los Angeles County Integrated Waste Management Plan concluded that there is enough capacity within permitted solid waste facilities (i.e., landfills) to serve Los Angeles County through the 15-year planning period of 2003–2018. With regard to inert landfills, the County's 2003 Annual Report, indicated that based on disposal rates during the preparation of the County's 2003 Annual Report, capacity within existing inert landfills would be available for approximately 60 years (i.e., around 2065). Based on this data, it was concluded that there would be no anticipated shortfall in disposal capacity for inert waste within the County.

Total solid waste generated by all Original Project construction activity is conservatively forecasted to total approximately 28,426 tons. Based on this forecast, Original Project generated construction-related waste (i.e., asphalt and construction debris) would represent a small percentage (0.04 percent) of the inert waste disposal capacity in the region. This level of impact constitutes a less than significant impact, as the Original Project would not create a need for additional solid waste disposal facilities to adequately handle Project-generated inert waste. Furthermore, this estimate is very conservative as it assumes no construction debris would be recycled. Therefore, impacts relative to construction waste would likely be far less based on the Applicant's construction practices that include recycling of debris.

During operations, a total of approximately 1.7 and 423.7 tons of solid waste would be generated on a daily and annual basis, respectively, based on the maximum amount of development that could occur under the Original Project. Of these totals, approximately 6 percent of the solid waste generated would be medical waste that would be treated to acceptable standards prior to landfill disposal. In addition, the Applicant would continue to implement its comprehensive program of recycling municipal solid waste generated at all of its facilities. This program consists of the following three components: (1) recycling; (2) waste to energy; and (3) material recovery. The University is also committed to an ever-expanding recycling program. On an annual basis, the University has met or exceeded the Citywide waste diversion goals set forth in AB 939 since the legislation was enacted (i.e., the diversion of 50 percent of the University's waste stream from landfill disposal). The Applicant has indicated that they would extend their existing recycling program to include the Original Project. In addition, the Original Project's contribution to the Countywide waste stream would constitute 0.0018 percent of the 23.8 million tons of solid waste generated in Los Angeles County in 2003 and 0.0015 percent of the 27.5 million tons of solid waste forecasted to be generated in Los Angeles County in 2015. Based on a diversion rate of 50 percent for municipal solid waste and 7 percent for medical wastes, the actual amount of solid waste disposed of at a landfill would be slightly more than half of that identified above. It is anticipated that landfill disposal capacity would be available to accommodate the solid waste generated by the Original Project. Although there is presently no guarantee that new or expanded disposal facilities will be opened by 2015, solid waste generated by the operation of the Original Project would not materially alter the projected timeline for these landfills to reach capacity. Impacts to municipal solid waste disposal facilities would, however, be considered potentially significant. With implementation of the mitigation measures provided below potential impacts would be reduced to a less than significant level.

As the Original Project would implement the policy directives of the applicable sections of the City of Los Angeles' Source Reduction and Recycling Element, the City's Solid Waste Management Policy Plan, General Plan Framework Element and the Curbside Recycling Program, via the implementation of project design features that are expressly targeted towards solid waste recycling during construction in addition to a comprehensive recycling program that would be implemented during operations, the Original Project would be consistent with the applicable referenced plans and policies, and a less than significant impact would result.

2. Modified Project Impacts

(a) Water

As with the Original Project, the majority of water use during construction would be associated with dust suppression for graded and excavated sites. This is generally

performed by water trucks which use non-potable water from off-site sources. As such, the impact on treated water from the Los Angeles Department of Water and Power (LADWP and on adjacent water conveyance systems would be incrementally small. Thus, like the Original Project, no significant impact to water resources is anticipated to occur during construction of the Modified Project and no mitigation measures are necessary.

With regard to water demand during operations, it was determined that Modified Project Option 1 would consume the greatest amount of water, and thus is the Option that is analyzed below.

Based on the land uses proposed under Option 1 and when accounting for development that has already occurred or is underway, the average domestic water demand would be approximately 251,034 gpd, as shown in Table 8 on page 88. This water demand would be approximately 15,270 gpd less than the Original Project. Like the Original Project, the water demand of the Modified Project would be less than significant in relation to the Urban Water Management Plan. Thus, the Modified Project's impacts on water would be within the envelope of impacts identified in the Certified EIR. In addition, the Modified Project would continue to implement the mitigation measures set forth below for the Original Project.

(b) Sewer

As stated above, like the Original Project, during construction, a negligible amount of wastewater would be generated by construction personnel. It is anticipated that portable toilets would be provided by a private company and the waste disposed of off-site. Thus, wastewater generation from construction activities is not anticipated to cause a measurable increase in wastewater flows. Additionally, construction is not anticipated to generate wastewater flows that would substantially or incrementally exceed the future scheduled capacity of any treatment plant by generating flows greater than those anticipated in the City Wastewater Facilities Plan. Thus, construction-related impacts on wastewater infrastructure and facilities would be less than significant.

With regard to wastewater generation during operations, it was determined that Modified Project Option 1 would generate the greatest amount of wastewater, and thus is the Option that is analyzed below.

Based on the land uses proposed for Option 1 and when accounting for development that has already occurred or is underway, the average wastewater generated under Option 1 would be approximately 196,770 gpd as shown in Table 9 on page 89. This wastewater generation would be approximately 11,280 gpd less than the Original Project. In addition, the same mitigation measures set forth for the Original Project would also be

Table 8
Estimated Water Demand—Original Project vs. Modified Project

Land Use	Development	Water Demand Factor	Water Consumption (gpd)	Annual Generation (million gallons)
Original Project				
Academic/Medical Research	720,000 sf	250 gpd/1,000 sf	180,000	65.70
Medical Clinic	45,000 sf	250 gpd/1,000 sf	11,250	4.11
Parking	840,000 sf	20 gpd/1,000 sf	16,800	6.13
Outdoor Water Use			58,254	21.26
Total Original Project			**266,304**	**97.20**
Modified Project				
HCC IV Medical Clinical Facilities	27,300 sf	250 gpd/1,000 sf	6,825	2.49
Student Housing				
1 bed, 1 bath studio	20 DU	68 gpd/unit	1,360	0.50
1 bed, 1 bath apartment	35 DU	120 gpd/ unit	4,200	1.53
2 bed, 2 bath apartment	44 DU	238 gpd/ unit	10,472	3.82
3 bed, 3 bath apartment[a]	40 DU	323 gpd/unit	12,920	4.72
4 bed, 4 bath apartment	46 DU	408 gpd/unit	18,768	6.85
Childcare Center	150 students	8 gpd/student	1,200	0.44
Hotel	275 rooms	130 gpd/ room	35,750	13.05
Research and Development	256,000 sf	250 gpd/1,000 sf	64,000	23.36
Outdoor Water Use[b]			54,264	19.81
Total Modified Project			209,759	**76.57**
HSC Projects Constructed and Underway				
Broad Center	62,500 sf	250 gpd/1,000 sf	15,625	5.70
HCC III Medical Clinical Facilities	92,700 sf	250 gpd/1,000 sf	23,175	8.46
HCC III Non-Clinical Facilities	9,900 sf	250 gpd/1,000 sf	2,475	0.90
Total HSC Projects Constructed and Underway			41,275	**15.06**
Total Modified Project Option 1 including HSC Projects Constructed and Underway			251,034	**91.63**

Numbers may not be exact due to rounding.

[a] *Three-bed, 3-bath apartment is a prorated generation factor based on the average between a 2-bedroom and 4-bedroom apartment generation factor.*

[b] *To be consistent with the USC Health Sciences Campus Project (May 2005), outdoor water use is assumed to be 28 percent of the forecasted daily Modified Project water consumption.*

Source: Matrix Environmental, 2013.

Table 9
Estimated Annual Wastewater Generation—Original Project vs. Modified Project

Land Use	Development	Wastewater Demand Factor	Wastewater Generation (gpd)	Annual Generation (million gallons)
Original Project				
Academic/Medical Research	720,000 sf	250 gpd/1,000 sf	180,000	65.70
Medical Clinic	45,000 sf	250 gpd/1,000 sf	11,250	4.11
Parking	840,000 sf	20 gpd/1,000 sf	16,800	6.13
Total Original Project			**208,050**	**75.94**
Modified Project				
HCC IV Medical Clinical Facilities	27,300 sf	250 gpd/1,000 sf	6,825	2.49
Student Housing				
1 bed, 1 bath studio	20 DU	68 gpd/unit	1,360	0.50
1 bed, 1 bath apartment	35 DU	120 gpd/ unit	4,200	1.53
2 bed, 2 bath apartment	44 DU	238 gpd/ unit	10,472	3.82
3 bed, 3 bath apartment[a]	40 DU	323 gpd/unit	12,920	4.72
4 bed, 4 bath apartment	46 DU	408 gpd/unit	18,768	6.85
Childcare Center	150 students	8 gpd/student	1,200	0.44
Hotel	275 rooms	130 gpd/ room	24,050	13.05
Research and Development	256,000 sf	250 gpd/1,000 sf	64,000	23.36
Total Modified Project			**155,495**	**56.76**
HSC Projects Constructed and Underway				
Broad Center	62,500 sf	250 gpd/1,000 sf	15,625	5.7
HCC III Medical Clinical Facilities	92,700 sf	250 gpd/1,000 sf	23,175	8.46
HCC III Non-Clinical Facilities	9,900 sf	250 gpd/1,000 sf	2,475	0.90
Total HSC Projects Constructed and Underway			**41,275**	**15.06**
Total Modified Project Option 1 including HSC Projects Constructed and Underway			**196,770**	**71.82**

Note: Numbers may not be exact due to rounding.

[a] *3 bed, 3 bath apartment is a prorated generation factor based on the average between a 2 bedroom and 4 bedroom apartment generation factor.*

Source: Matrix Environmental, 2013.

implemented under the Modified Project. Therefore, impacts associated with wastewater facilities would be less than significant and such impacts would be within the envelope of impacts identified in the Certified EIR.

(c) Solid Waste

As with the Original Project, construction of the Modified Project would result in demolition and construction debris. Like the Original Project, some of the construction waste generated under the Modified Project would be disposed of at unclassified landfills. The unclassified landfills that would accept such materials have sufficient capacity to accommodate the disposal of materials associated with construction activities. Therefore, as with the Original Project, the Modified Project would result in less than significant solid waste impacts during construction.

With regard to solid waste generation during operations, it was determined that Modified Project Option 1 would generate the greatest amount of solid waste annually, and thus is the Option that is analyzed below.

As shown in Table 10 on page 91, the Original Project would generate approximately 423.7 tons of solid waste per year. In comparison, Option 1 would generate approximately 1,536.25 tons of solid waste annually. In addition, when accounting for the HSC projects constructed and underway (Broad Center and HCC III) the Modified Project would generate a total of approximately 1,549.77 tons of solid waste annually. As such, similar to the Original Project, impacts to Class III solid waste disposal facilities would be considered potentially significant under the Modified Project.

However, the solid waste anticipated to be generated by Modified Project Option 1 (including the Broad Center and HCC III) would account for only 0.0082 percent of the 19.5 million tons of solid waste generated in the Los Angeles County in 2010. In addition, it is noted that since 2003 the overall County of Los Angeles generation rate has decreased 18.1 percent. Therefore, it is anticipated that the existing and planned landfills/ improvements identified in the County Integrated Waste Management Plan 2010 Annual Report would be able to accommodate the Modified Project-generated waste. Furthermore, in future years, it is anticipated that the rate of declining landfill capacity would slow considering the City's Solid Waste Integrated Resources Plan objective to achieve a 70 percent diversion goal by 2015. In addition, like the Original Project, the Modified Project would implement mitigation measures to reduce the amount of solid waste generated within the Project Site. As such, though the Modified Project would generate more solid waste compared to the Original Project, impacts regarding solid waste generation and disposal under the Modified Project would be less than significant.

As with the Original Project, the Modified Project would comply with Senate Bill 1374 (Construction and Demolition Waste Materials: Diversion Requirements). In addition, the Modified Project would comply with federal, state, and local statutes and regulations related to solid waste including the City's Solid Waste Integrated Resources Plan, City's General

Table 10
Estimated Annual Solid Waste Generation—Original Project vs. Modified Project

Land Use	Development	Solid Waste Factor	Waste (lbs per year)	Waste (tons per year)
Original Project				
Municipal Solid Waste	765,000 sf	4.08 lbs/1,000 sf/day	811,486	405.8
Medical Solid Waste	765,000 sf	0.18 lbs/1,000 sf/day	35,802	17.9
Total Original Project			**847,314**	**423.7**
Modified Project Option 1				
HCC IV Medical Clinical Facilities	27,300 sf	0.18 lbs/1,000 sf/ day	1,277.64	0.639
Student Housing	185 DU	12.23 lbs/household/day	825,830.75	412.92
Childcare Center	11,560 sf	0.0007 lbs/sf/ day	2,103.92	1.052
Hotel[a]	275 rm	5,049 lbs/employee/day	1,731,807	865.90
Research and Development	256,000 sf	1,998 lbs/1,000 sf/day	511,488	255.744
Total Modified Project			**3,072,507.31**	**1,536.25**
HSC Projects Constructed and Underway				
Broad Center	62,500 sf	0.18 lbs/1,000 sf/day	2,925	1.46
HCC III Medical Clinical Facilities	92,700 sf	0.18 lbs/1,000 sf/day	4,338.36	2.17
HCC III Non-Clinical Facilities	9,900 sf	1,998 lbs/household/day	19,780.2	9.89
Total HSC Projects Constructed and Underway			**27,043.56**	**13.52**
Total Modified Project Option 1 including HSC Projects Constructed and Underway			**3,099,550.87**	**1,549.77**

Numbers may not be exact due to rounding.
sf = square feet
DU = dwelling units
rm = rooms
[a] *Anticipated number of employees was calculated based on a factor of 1.246 employees per room.*
Source: Matrix Environmental, 2013.

Plan Framework Element, RENEW LA Plan, and Green LA Plan. Furthermore, since the certification of the EIR, the City achieved a diversion rate of 65 percent, exceeding the 50 percent diversion rate required by AB 939.[23] In addition, implementation of mitigation measures would facilitate recycling on-site and help to ensure that the Project's impact on regional solid waste disposal capacity is minimized. As such, as with the Original Project, the Modified Project's impacts associated with solid waste plans and policies would be less than significant.

[23] *City of Los Angeles Department of Public Works, Bureau of Sanitation. Solid Resources: Recycling Information, http://lacitysan.org/solid_resources/recycling/index.htm, accessed October 31, 2011.*

As with the Original Project, the Modified Project would comply with Senate Bill 1374 (Construction and Demolition Waste Materials: Diversion Requirements). In addition, the Modified Project would comply with federal, state, and local statutes and regulations related to solid waste including the City's Solid Waste Integrated Resources Plan, City's General Plan Framework Element, RENEW LA Plan, and Green LA Plan. Furthermore, since the certification of the EIR, the City achieved a diversion rate of 65 percent, exceeding the 50 percent diversion rate required by AB 939.[24] In addition, implementation of mitigation measures would facilitate recycling on-site and help to ensure that the Project's impact on regional solid waste disposal capacity is minimized. As such, as with the Original Project, the Modified Project's impacts associated with solid waste plans and policies would be less than significant.

3. Mitigation Measures

The mitigation measures set forth in the Certified EIR and provided below remain applicable to the Modified Project. No additional mitigation measures are required due to the development of the Modified Project.

(a) Water

Mitigation Measure F-1.1: Water faucet fixtures with activators shall be installed that automatically shut off the flow of water when not in use.

Mitigation Measure F-1.2: Automatic sprinkler systems shall be set to irrigate landscaping during early morning hours or during the evening to reduce water losses from evaporation. Sprinklers shall be reset to water less often in cooler months and during the rainfall season so that water is not wasted by excessive landscape irrigation.

(b) Sewer

Mitigation Measure F-2.1: Prior to the issuance of any building permits, the Development Services Division of the Bureau of Engineering, Department of Public Works, shall make a determination of capacity in the sewer pipeline between each proposed Development Site and the trunk sewer. If service is discovered to be less than adequate, the Applicant shall be required to upgrade the connections to the mains and/or provide an alternative solution, in order to appropriately serve the Project.

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[24] *City of Los Angeles Department of Public Works, Bureau of Sanitation. Solid Resources: Recycling Information, http://lacitysan.org/solid_resources/recycling/index.htm, accessed October 31, 2011.*

Mitigation Measure F-2.2: The Applicant shall comply with procedural requirements of City ordinances regulating connections to the City sewer system (e.g., Ordinance No. 166,060).

Mitigation Measure F-2.3: All necessary on-site infrastructure improvements shall be constructed to meet the requirements of the Department of Building and Safety.

Mitigation Measure F-2.4: The Applicant shall apply for and comply with all necessary permits, including Industrial Wastewater Discharge Permits, if required.

(c) Solid Waste

Mitigation Measure F.3-1: The Applicant shall comply with the provisions of City of Los Angeles Ordinance No. 171687 with regard to all new structures constructed as part of the proposed Project.

Mitigation Measure F.3-2: The Applicant shall implement a demolition and construction debris recycling plan for all buildings constructed as part of the proposed Project, with the explicit intent of requiring recycling during all phases of site preparation and building construction.

Mitigation Measure F.3-3: All structures constructed or uses established within any part of the proposed Project Site shall be designed to be permanently equipped with clearly marked, durable, source sorted recycling bins at all times to facilitate the separation and deposit of recyclable materials.

Mitigation Measure F.3-4: Primary collection bins shall be designed to facilitate mechanized collection of such recyclable wastes for transport to on- or off-site recycling facilities.

Mitigation Measure F.3-5: The Applicant shall coordinate with the City of Los Angeles to continuously maintain in good order for the convenience of concessionaires, patrons, and employees clearly marked, durable and separate recycling bins on the same lot, or parcel to facilitate the deposit of recyclable or commingled waste metal, cardboard, paper, glass, and plastic therein; maintain accessibility to such bins at all times, for collection of such wastes for transport to on- or off-site recycling plants; and require waste haulers to utilize local or regional material recovery facilities as feasible and appropriate.

VI. Conclusion

As demonstrated by the discussion above, and as summarized in Table 11 on page 94, impacts associated with the Modified Project would be similar to or less than the impacts addressed in the Certified EIR. Thus, a new or greater significant impact would not result from the proposed modifications. In addition, all of the mitigation measures

Table 11
Comparison of Impacts Under Original Project and Modified Project

Issue	Original Project	Modified Project
Visual Resources		
Construction	Less than Significant	Less than Significant
Operation	Less than Significant	Less than Significant
Agriculture Resources	No Impact	No Impact
Air Quality and Greenhouse Gas Emissions		
Construction		
Regional Emissions	Significant and Unavoidable	Significant and Unavoidable
Localized Emissions	Significant and Unavoidable	Less Than Significant with Mitigation
Operation		
Regional Emissions	Significant and Unavoidable	Significant and Unavoidable
Localized Emissions	Less Than Significant	Less Than Significant
Greenhouse Gas Emissions	N/A*	Less than Significant
Biological Resources	Less than Significant	Less than Significant
Cultural Resources	Less than Significant	Less than Significant
Geology and Soils	Less than Significant	Less than Significant
Hazards and Hazardous Materials	Less than Significant	Less than Significant
Surface Hydrology and Water Quality, and Groundwater		
Hydrology	Less than Significant	Less than Significant
Surface Water Quality	Less than Significant	Less than Significant
Groundwater	Less than Significant	Less than Significant
Land Use and Planning		
Consistency with Applicable Plans	Less than Significant	Less than Significant
Project Compatibility with Surrounding Land Uses	Less than Significant	Less than Significant
Mineral Resources	No Impact	No Impact
Noise		
Construction	Significant and Unavoidable	Significant and Unavoidable
Operation	Less than Significant	Less than Significant
Population and Housing	Less than Significant	Less than Significant
Public Services		
Fire	Less than Significant	Less than Significant
Police	Less than Significant	Less than Significant
Schools	Less than Significant	Less than Significant
Parks	Less than Significant	Less than Significant
Libraries and Other Public Services	Less than Significant	Less than Significant

Table 11 (Continued)
Comparison of Impacts Under Original Project and Modified Project

Issue	Original Project	Modified Project
Recreation	Less than Significant	Less than Significant
Traffic, Circulation, and Parking		
Construction	Less than Significant	Less than Significant
Operation		
Traffic	Significant and Unavoidable	Significant and Unavoidable
Access	Less than Significant	Less than Significant
Parking	Less than Significant	Less than Significant
Utilities/Service Systems		
Water	Less than Significant	Less than Significant
Sewer	Less than Significant	Less than Significant
Solid Waste	Less than Significant	Less than Significant

**Until the passage of AB 32 in 2006, CEQA documents generally did not evaluate GHG emissions or impacts on global climate change. In addition, subsequent to the completion of the Original Project's Certified EIR, the state's Office of Planning and Research's recommended amendments to the CEQA Guidelines for GHGs were adopted by the Resources Agency on December 30, 2009. The Draft Environmental Impact Report for the USC Health Sciences Project was completed in May 2005.*

Source: Matrix Environmental, 2013.

included as part of the Certified EIR would continue to be implemented under the Modified Project. As all of the impacts would be within the envelope of impacts analyzed in the Certified EIR, no additional environmental analysis of the Modified Project is necessary.

APPENDIX B – HYDROLOGY MEMORANDUM

MEMORANDUM OF HYDROLOGY MODELING RESULTS

Project: **LAC+USC Medical Center EIR**

Client: ICF International/Los Angeles County

Prepared By: Jennifer J. Walker, P.E., D.WRE, CFM, QSD

Date: 7/15/2014

Purpose: Memorandum of Hydrology Modeling Results

Note: Draft memorandum released under the authority of Jennifer J. Walker, P.E. (C77079), D.WRE, CFM on 7/15/2014 and should not be used for design or construction.

This memorandum documents hydrologic and Low Impact Development (LID) modeling results for ultimate build-out of the LAC+USC Medical Center project as described in the October, 2013 *LAC+USC Master Plan.* The project is anticipated to include post-construction stormwater Best Management Practices (BMPs) and Low Impact Development (LID) features. Because a detailed plan has not been developed hydrologic and LID analyses are based on the general concept and layout described in the *Master Plan* rather than a detailed, fixed plan.

As shown on Exhibit 1 (Appendix A), the project site is located just north of Interstate Highway (IH) 10 and just east of IH-5. The site is bounded by Cornwell to the east, Zonal to the north, Marengo to the south, and North Mission to the west. Three additional tracts are located at northeast, northwest, and southwest corners of the intersection of Zonal and North Mission.

The project site is currently fully developed and land cover consists primarily of buildings and pavement with an existing impervious cover of 95% (Exhibit 2 in Appendix A). While limited, vegetation on the site includes trees, shrubs, and turf grass scattered within the project site and dense plantings of trees and groundcovers within the northeastern portion of the site ("the hill").

The Proposed Stormwater Conveyance Concept Plan from the *Master Plan* (Appendix A1) illustrates the location of the following LID features at the site:

- Bioretention
- Permeable Pavement
- Wetlands/Detention

While the *Master Plan* indicates that stormwater harvesting and reuse may be included and that a green roof will be installed for agricultural and urban farming purposes, these LID features are not included in the modeling for the project as they are not specifically programmed at this time.

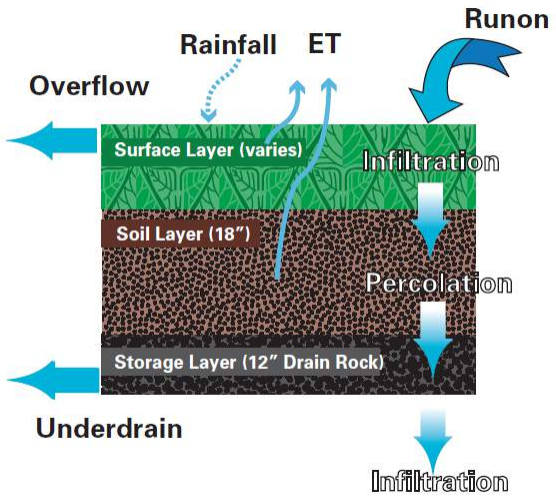
The goals established for this project include:

- ✓ Meet Los Angeles County LID and stormwater treatment criteria
- ✓ Reduce proposed LID conditions peak flows and runoff volumes to below existing conditions
- ✓ Shift the water budget and site hydrology towards undeveloped conditions with improved infiltration and groundwater recharge as compared to existing conditions

Modeling/Hydrologic Methodology

The U.S. Environmental Protection Agency's (EPA)'s Storm Water Management Model (SWMM) 5.0.022 was utilized for the LID design storm and continuous simulation modeling in this project. The current version of SWMM includes LID controls and detailed analysis options not previously included in SWMM5. The SWMM model is also a publicly-available model. The SWMM model accounts for infiltration through various LID layers, evapotranspiration, infiltration into the native soil, and overflows and discharge from the LID facilities as illustrated in Figure 1. Note that the underdrain and drain rock layer are used only in Permeable Pavement and Bioretention for this project.

Figure 1: LID Components and Processes Modeled in SWMM



Recent studies by the EPA cited in the report entitled *SUSTAIN – A Framework for Placement of Best Management Practices in Urban Watersheds to Protect Water Quality* found similar results for analysis of aggregated (lumped) LID controls in drainage sub-areas of 100 ac or more as compared to micro-drainage sub-areas for each lot and LID control (distributed approach). For a 128-acre drainage sub-area, the difference in peak flows between the aggregated and distributed approaches computed in the EPA study is four-percent. Similar positive findings with regards to the aggregated approach were also reported by the City of Portland's Bureau of Environmental Services in a paper entitled *Modeling Non-Directly Connected Impervious Areas in Dense Neighborhoods.*

Since the area of the LAC+USC Medical Center EIR site is approximately 84 ac and well under the threshold for using the aggregated method, the aggregated modeling approach was used for this project to increase modeling efficiencies. Peak flow rates are expected to be within one-percent of those computed using the distributed approach and volumes are expected to be within approximately three-percent.

Table 1 in Appendix B lists hydrologic parameters associated with the site. Proposed conditions parameters are based on the LID layout included in the Proposed Stormwater Conveyance Concept Plan from the *Master Plan* (Appendix A1). Existing and undeveloped conditions parameters are estimated and may not precisely reflect conditions as soils, topographic, and other detailed data is not available.

The Direct Determination Runoff method is used to estimate runoff and generate hydrographs from the site within the SWMM model. As described below, the design storm rainfall data is obtained from National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6. Rainfall hyetographs are developed using the U.S. Army Corps of Engineers (USACE) HEC-HMS (Hydrologic Engineering Center-Hydrologic Modeling System) software program, which is publicly available.

The Green & Ampt method, which is based on physically-measurable soil parameters and has been used successfully on other LID projects in the region, is used to estimate losses due to infiltration. Based on Exhibit 7 in Appendix A, native underlying soils at the sites are assumed to be a mix of clay loam and loam with saturated hydraulic conductivity rates of approximately 0.085 inches/hour. The suction head and initial deficit parameters shown in Table 2 are estimated for a mix of clay loam and loam from standard soils texture tables.

Table 3 provides details on the area draining to each LID feature at the site based on the Proposed Stormwater Conveyance Concept Plan from the *Master Plan* (Appendix A1). Table 4 includes details on the configuration modeled for each type of LID feature at the site. As indicated in these tables, the project site includes the following LID features:

- Permeable Pavement
- Bioretention
- Wetlands/Detention

To facilitate planning-level modeling, the Wetlands/Detention areas are modeled as bioretention. Additionally, the impervious area treated by each type of LID is assumed based on the LID features and site layout shown in the Proposed Stormwater Conveyance Concept Plan from the *Master Plan* (Appendix A1).

The proposed LID features are also planned to meet requirements in the Los Angeles County *Low Impact Development Standards Manual.* The goal of the LID features is to provide stormwater quality benefits and to more closely mimic undeveloped site hydrology. LID features are required to retain 100-percent of the stormwater quality design volume (SWQDv) on-site through a combination of infiltration, evapotranspiration, and stormwater harvest and use unless it is demonstrated that it is technically infeasible to do so. For this project, the SWQDv is 0.95 in, which is the 85th-percentile, 24-hour event obtained from the Los Angeles County 85th percentile precipitation isoheytal map for the project site location.

Based on the LID features illustrated in the Proposed Stormwater Conveyance Concept Plan from the *Master Plan* (Appendix A1) and assumed configurations documented in Table 4, the proposed LID features seem adequate to meet SWQDv requirements assuming storage within the growing

media and drain rock layers is considered (Table 4A). With these layers, the total provided volume is estimated at 9.26 acre-feet (ac-ft), while the required SWQDv is calculated at 6.62 ac-ft. Without these layers, additional LID features may be needed to meet requirements as a deficit of 2.73 ac-ft is estimated. Additionally, note that retention, harvest and use on-site, or infiltration must be provided for the total SWQDv and the size and configuration of the LID features may need to be modified to meet this requirement. Regardless, the proposed site will be required to meet SWQDv requirements and the LID extent may be increased as needed or stormwater harvesting and use may be incorporated. The project is likely to be exempt from hydromodification management requirements as it is a redevelopment project anticipated to result in less impervious cover than existing conditions.

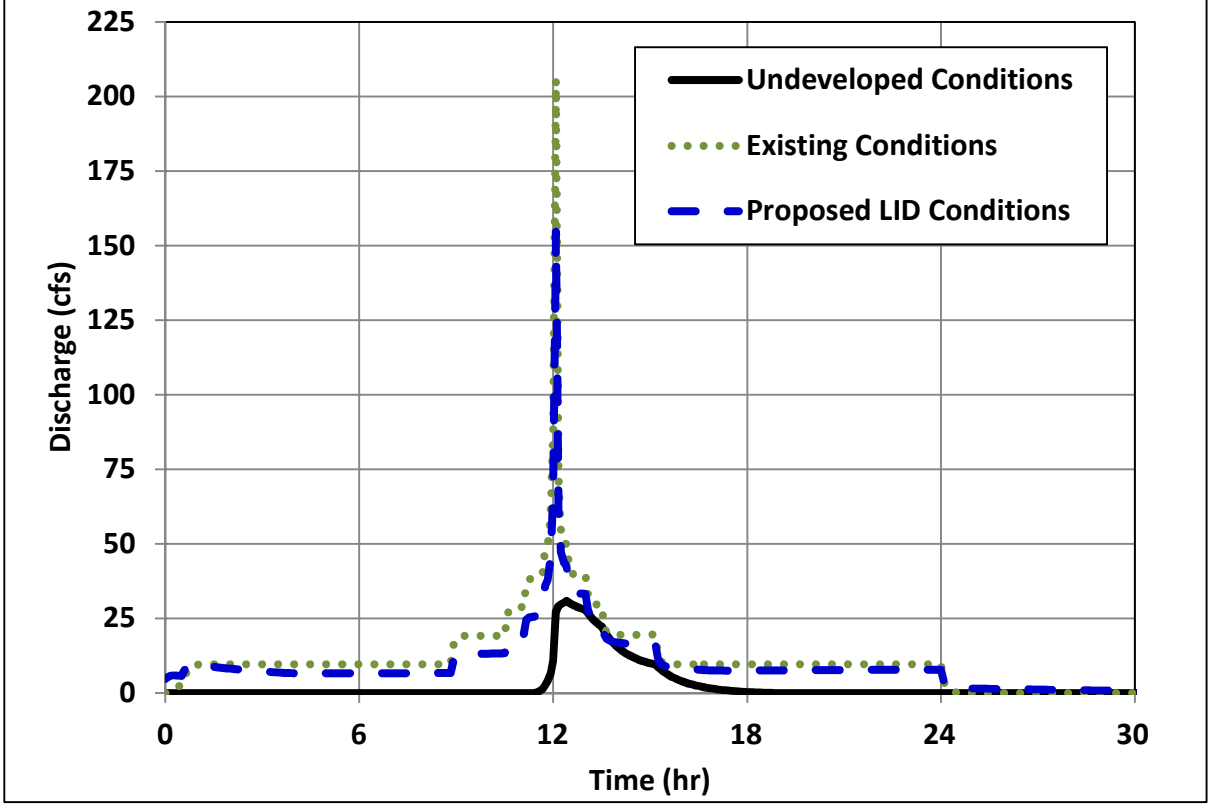
Design Storm Results

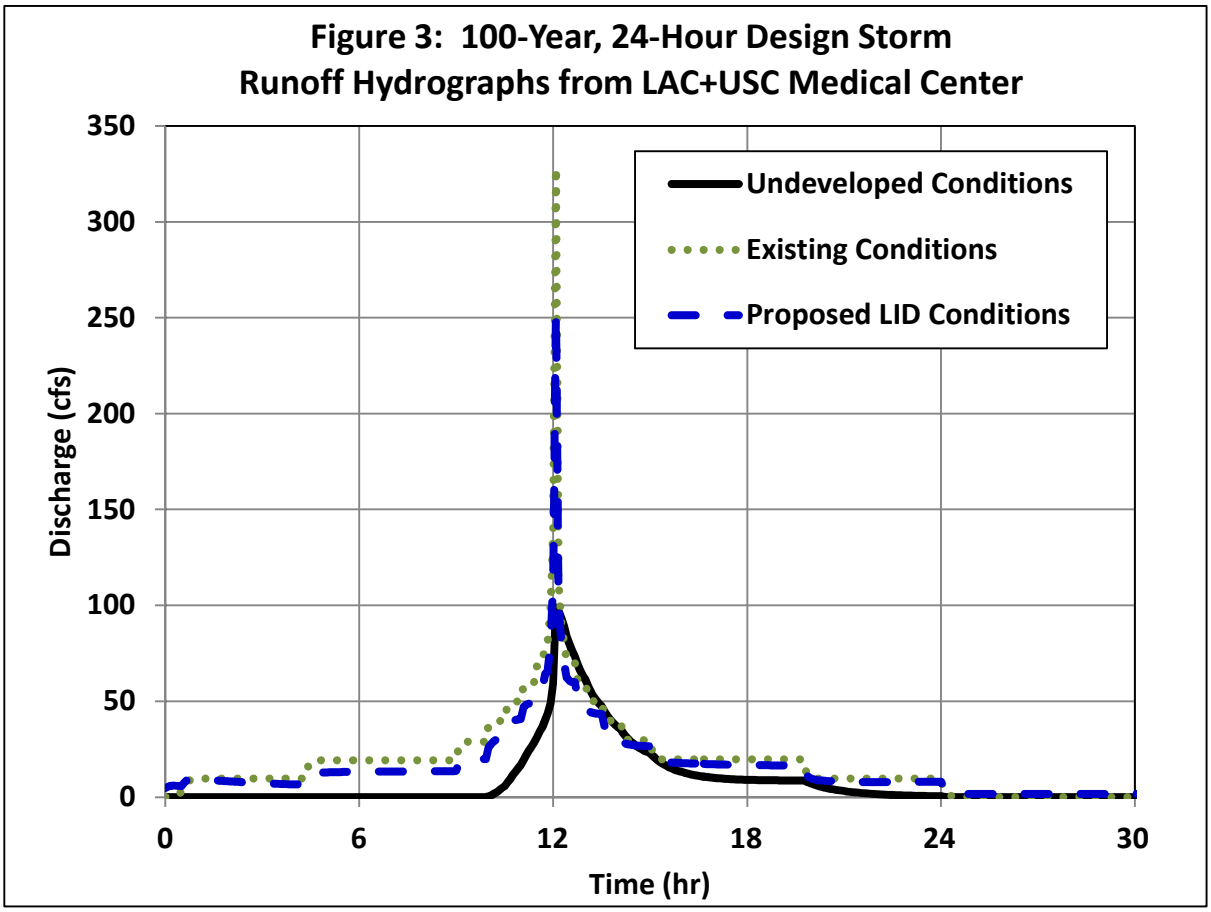
The 100-year, 24-hour and 10-year, 24-hour design storm events are modeled to assess runoff during an extreme flood control event and an event representative of storm drain sizing, respectively. As shown in Table 1, the 10-year, 24-hour and 100-year, 24-hour rainfall depths fare 4.84 and 7.87 inches (in), respectively. As indicated, the design storm rainfall data is obtained from NOAA Atlas 14, Volume 6 for the Ascot Reservoir gauge and rainfall hyetographs are developed using the USACE HEC-HMS software program, which is publicly available. A peak center of 50% is assumed for all design storm events. The rainfall hyetographs are used by SWMM to develop the design storm runoff hydrographs from the LAC+USC site.

As shown in Table 5, proposed conditions peak flows with the planned LID features are 25-percent less than existing flows from the site for the 10-year, 24-hour event and 23-percent less than existing for the 100-year, 24-hour event. Runoff volumes are reduced by 18-percent and 14-percent, respectively, for the 10-year and 100-year events. While the project goals did not include matching undeveloped conditions, it is also listed for comparison purposes. Note that the initial growing media saturation of 50-percent adds volume to the proposed LID conditions that is not included in the other conditions models. Use of different initial growing media saturation values may change resulting reductions.

Figures 2 and 3 depict runoff hydrographs from the site for the 10-year, 24-hour and 100-year, 24-hour design storm events, respectively. As described, both proposed LID conditions peak flows and runoff volumes as illustrated by the area under the hydrograph curves are reduced by approximately 25-percent below existing conditions. Additionally, the shapes of the proposed LID conditions runoff hydrographs generally match the shapes of the undeveloped conditions runoff hydrographs. Note that final modeling of underdrain sizes and retention times may result in additional hydrograph lagging.

Figure 2: 10-Year, 24-Hour Design Storm
Runoff Hydrographs from LAC+USC Medical Center





Figures 4 to 13 illustrate storage depths within the following layers of the LID features at the LAC+USC Medical Center site:

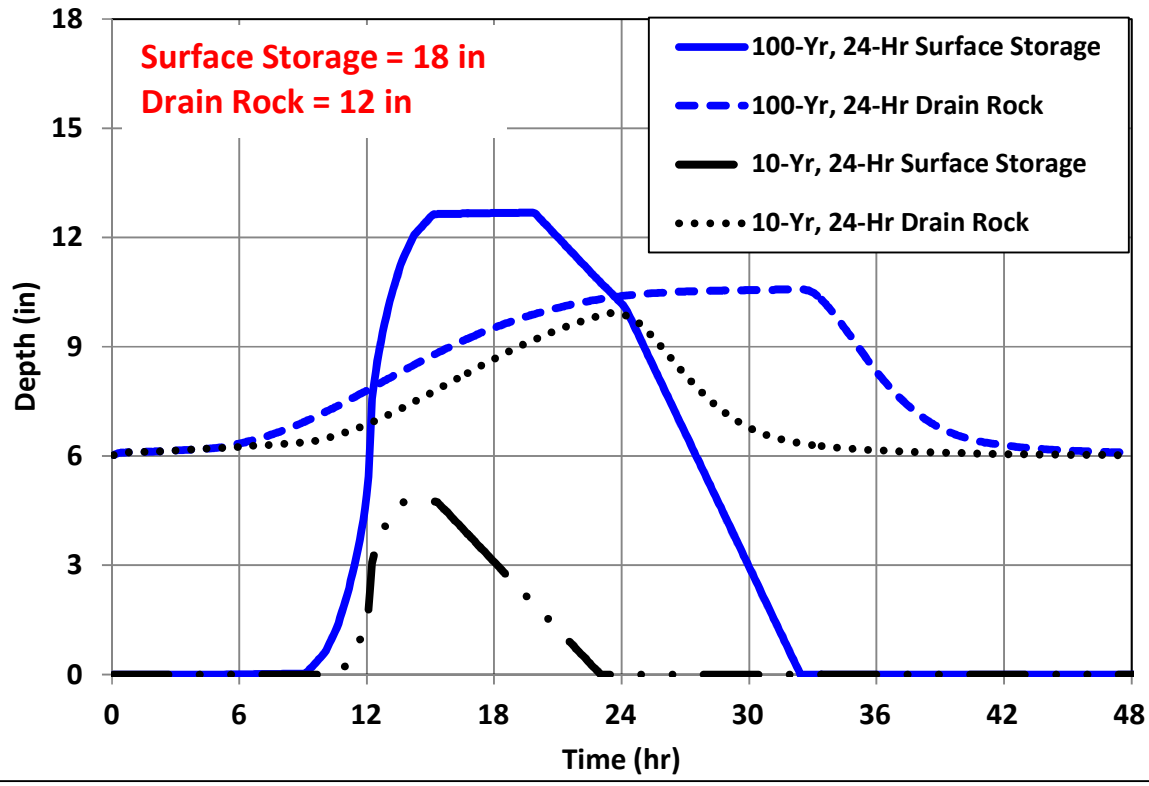
- 18-inch surface storage layer of Bioretention
- 24-inch surface storage layer of Wetlands/Detention
- 12-inch drain rock layer of Bioretention
- 24-inch gravel storage reservoir of Permeable Pavement

Due to hydraulic conductivity rates, underdrains are included in both Bioretention and Permeable Pavement and assumed to be elevated six inches above the bottom of the drain rock layer. Wetlands/detention is assumed not to include an underdrain due to type of LID feature and centralized nature of this stormwater control.

Note that typical assumptions were made regarding the geometric configuration of the LID features (Table 4). Additionally, assumptions on impervious area treated by each type of LID feature are listed in Table 3. During the final design and modeling, it is likely that the hydrologic performance of the various LID features can be improved through changes in geometric configuration and optimization of contributing drainage areas.

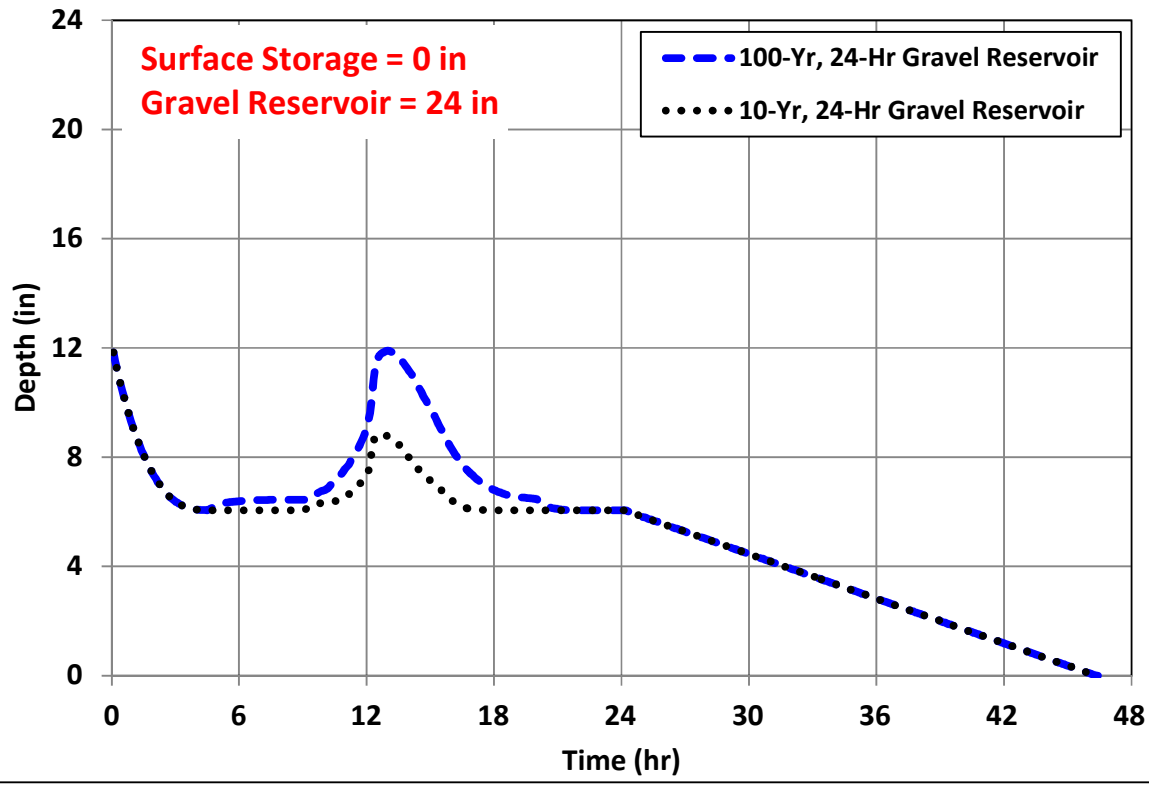
The proposed Bioretention features function as expected and fill to a depth of approximately 13 in in the 100-year, 24-hour event with a drain down time of approximately 32 hours. The maximum level during the 10-year, 24-hour event is approximately 4.8 in with a corresponding drain down time of approximately 24 hours. Initial storage depth in the Bioretention drain rock layer is due to the simulated 50-percent growing media saturation at the beginning of the design storm event. The Bioretention configuration is assumed to include a four-inch perforated underdrain pipe elevated six inches above the bottom of the drain rock layer. Since the Bioretention surface storage does not fill completely, during final design it may be determined to serve additional drainage area or be reduced in depth to less than 18 in.

Figure 4: Design Storm Hydrographs from Bioretention



The drain rock layer of the Permeable Pavement fills to approximately 12 in during the 100-year, 24-hour event and 9 in during the 10-year, 24-hour event. The drain down time fin both events is approximately 48 hours due to the initial saturation of 50%, which causes the initial ponding in the drain rock layer at the beginning of the design storm simulations. The Permeable Pavement LID features are assumed to include a four-inch perforated underdrain pipe elevated six inches below the bottom of the 24-inch gravel storage reservoir. The elevated underdrain enhances infiltration during the historical period of record analyzed in the continuous simulation modeling discussed below. Since the Permeable Pavement drain rock layer does not fill completely, during final design it may be determined to serve additional drainage area or be reduced in depth to less than 24 in.

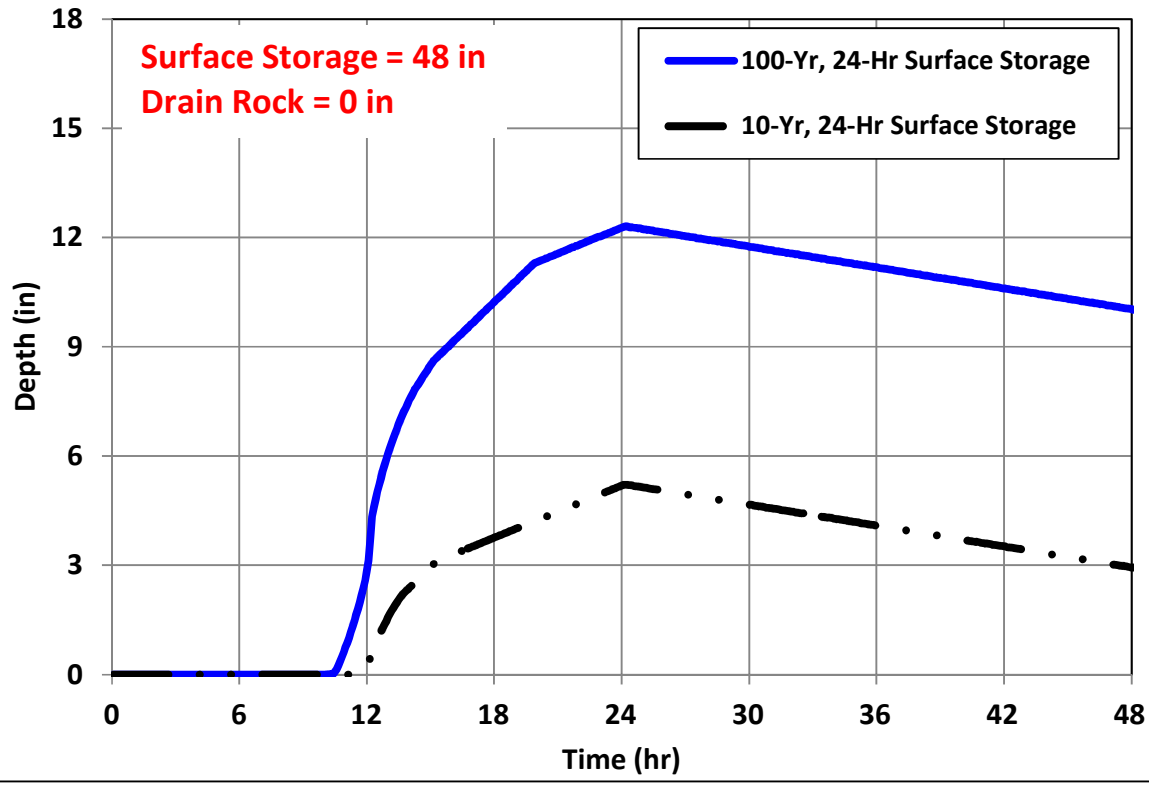
Figure 5: Design Storm Hydrographs from Permeable Pavement



The proposed Wetlands/Detention features fill to a depth of approximately 12 in in the 100-year, 24-hour event with a drain down time in excess of 48 hours. The maximum level during the 10-year, 24-hour event is approximately 5.2 in with a corresponding drain down time of in excess of 48 hours. While the proposed Wetlands/Detention stormwater features was modeled as an LID control using bioretention parameters due to the planning-level nature of this analysis, it may be better represented as a storage reservoir in the final modeling during the design phase as it is a centralized BMP and detention routing may be needed depending on the area served by the Wetlands/Detention.

The Wetlands/Detention configuration is assumed to not require an underdrain as it is a centralized stormwater facility and may be geared towards flood control. The Wetlands/Detention does not fill completely in the modeling performed as part of the LA+USC Medical Center EIR and the actual configuration and dimensions should be refined to meet project goals during the final design phase.

Figure 6: Design Storm Hydrographs from Wetlands/Detention



Continuous Simulation Results

A continuous simulation modeling analysis was performed based on 1970 – 2006 rainfall data obtained from the U.S. EPA's National Stormwater Calculator for the Los Angeles Downtown/USC gauge, which is located in closest proximity to the site. Average monthly evaporation data is also used from this gauge. While hourly data is used in the continuous simulation modeling analysis, daily events are summarized in this figure. Figure 7 illustrates historical daily rainfall depths during the period of record from 1970 – 2006 recorded at the Los Angeles Downtown/USC gauge. Days without rain are not shown on this graph.

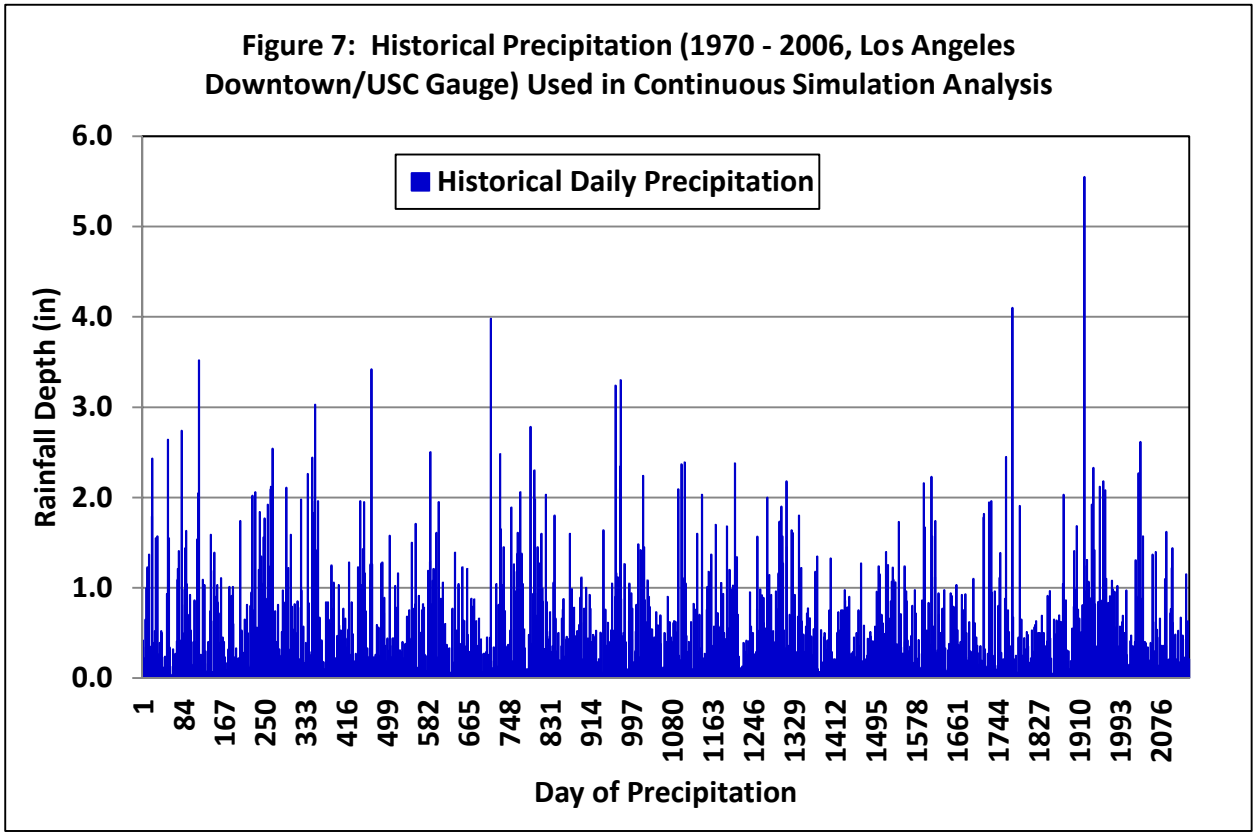
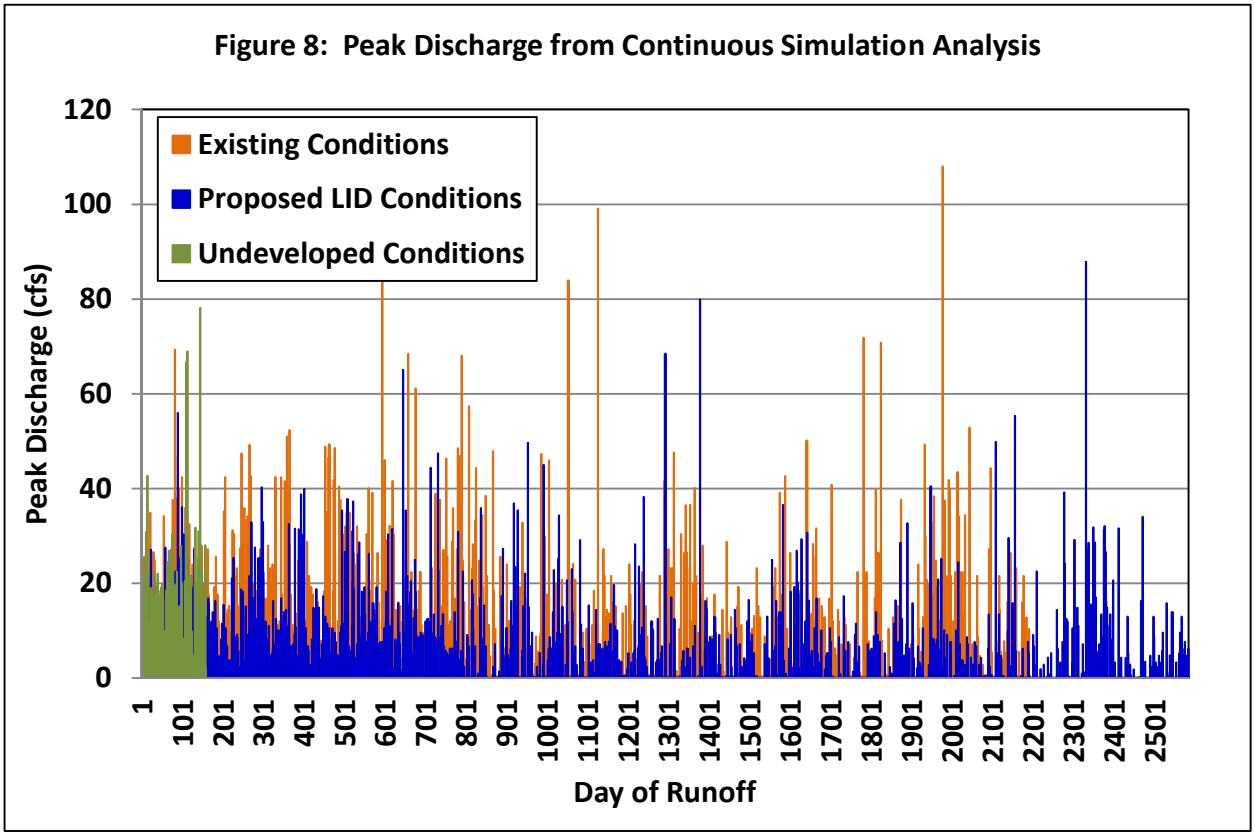


Figure 7: Historical Precipitation (1970 - 2006, Los Angeles Downtown/USC Gauge) Used in Continuous Simulation Analysis

Table 6 includes water balance results for the continuous simulation analysis and summarizes infiltration, runoff, evapotranspiration, and precipitation. During the simulated time period, 570.79 in. of rain occurred. Proposed LID conditions runoff is reduced by 35-percent as compared to existing conditions.

Information on the number of rainfall events producing runoff is summarized in Table 7. There are 991 proposed LID conditions runoff events as compared to 1,052 existing conditions runoff events and 131 undeveloped conditions runoff events. Due to limited data, undeveloped conditions are approximated rather than accurately measured from physical parameters at the site (i.e., soils, slopes, etc.). Figure 8 graphically illustrates runoff in existing and proposed conditions at the site. Note that the day of runoff (x-axis) is for each event and that the days do not correlate for each event. The general pattern is that proposed LID peak discharges are less than existing peak discharges and the proposed site is more similar to the undeveloped site than is the existing site.

Figure 8: Peak Discharge from Continuous Simulation Analysis



Annual maximum peak discharges are depicted in Figure 9 on the following page. Proposed LID conditions maximum annual discharges from the site more closely approximate undeveloped conditions than do discharges from the existing site. In most years, maximum annual discharges from the site are less than existing discharges from the site during the period of record between 1970 and 2006. Note that the actual results are anticipated to change somewhat during final design and modeling depending on the final extent and configuration of LID features and impervious cover within the site.

Since the project in not anticipated to require hydromodification management controls as it is a redevelopment project resulting in lower impervious cover, discharge exceedance frequency curves and flow duration graphs are not included.

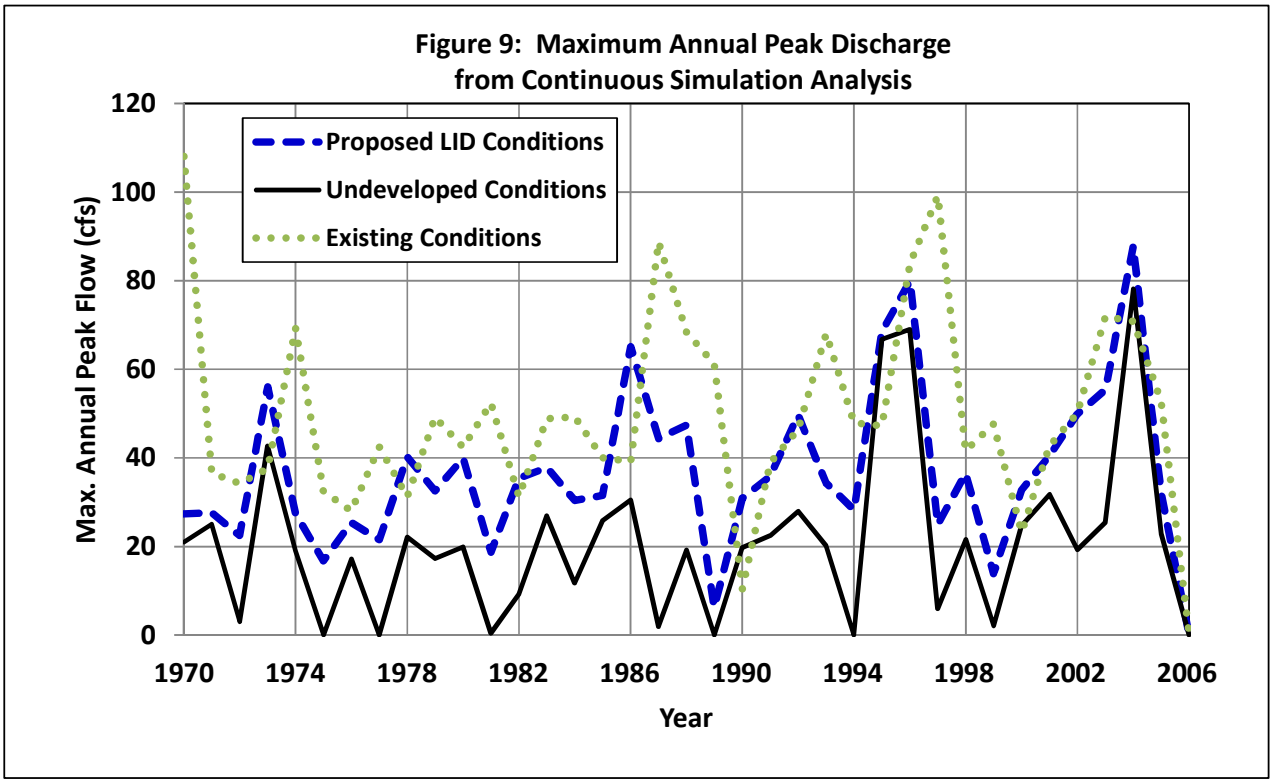


Figure 9: Maximum Annual Peak Discharge
from Continuous Simulation Analysis
Proposed LID Conditions
Undeveloped Conditions
Existing Conditions
Max. Annual Peak Flow (cfs)
120
100
80
60
40
20
0
1970
1974
1978
1982
1986
1990
1994
1998
2002
2006
Year

Conclusions

The LAC+USC Medical Center project meets established project goals:

- ✓ Meet Los Angeles County LID and stormwater treatment criteria
- ✓ Reduce proposed LID conditions peak flows and runoff volumes to below existing conditions
- ✓ Shift the water budget and site hydrology towards undeveloped conditions with improved infiltration and groundwater recharge as compared to existing conditions

Detailed water budget modeling results from EPA SWMM are included in Appendix C.

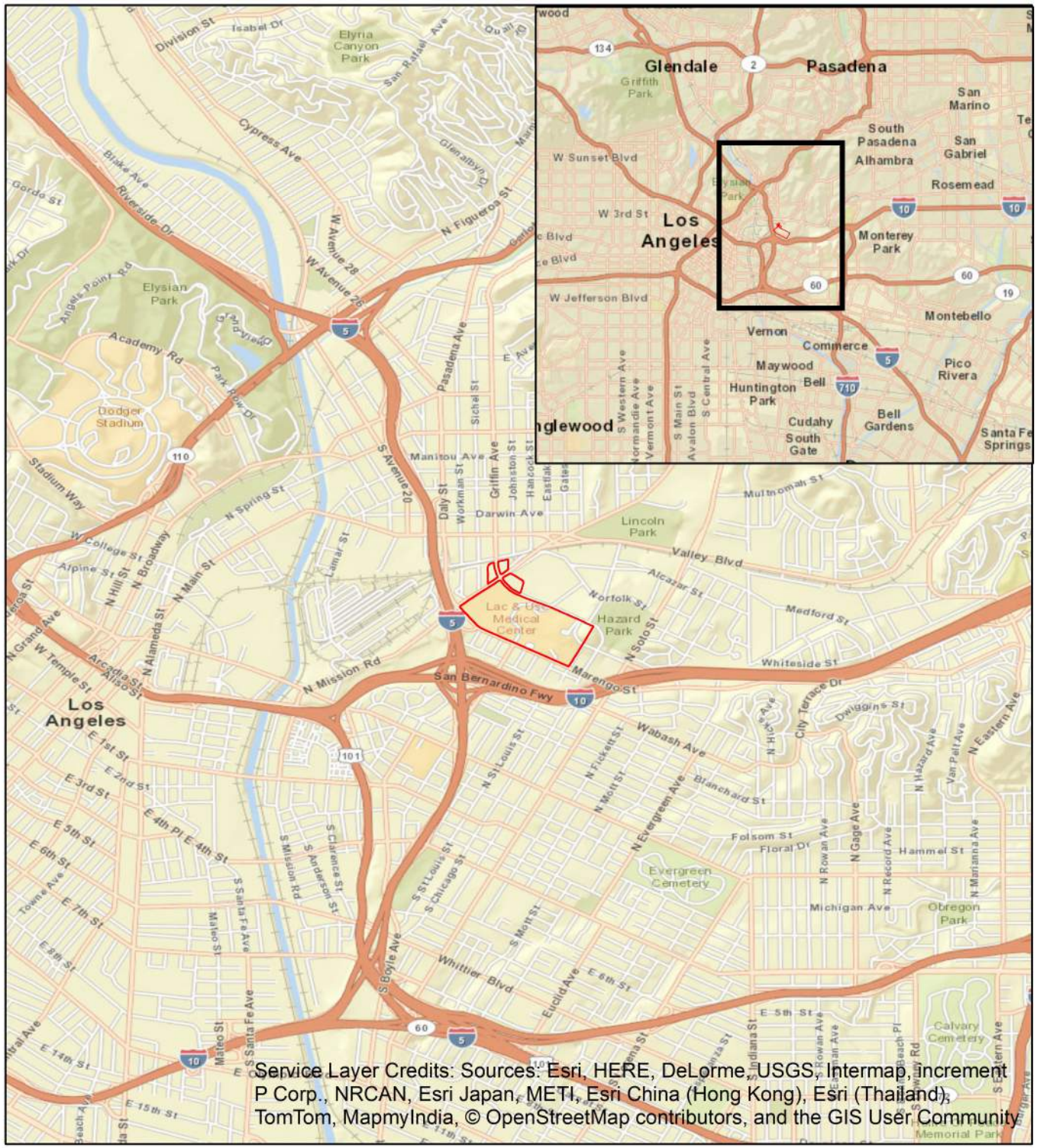
To ensure the long-term functionality of the LID features and performance of the site, development of and compliance with an Operations & Maintenance (O&M) Plan is critical. Additionally, proper construction sequencing is critical to avoid premature sedimentation of the facilities.

Redevelopment of the LAC+USC Medical Center site represents a significant opportunity for sustainability and LID retrofits within a densely urbanized area and for implementation of Green Infrastructure and LID for Los Angeles County. Thank-you for the opportunity to collaborate on this visionary project.

APPENDICES

Appendix A – Exhibits
Appendix B – Tables of Modeling Data and Results
Appendix C – EPA SWMM Water Budget Results

APPENDIX A - EXHIBITS



North

0 2,500 5,000 10,000 Feet

1 inch = 4,000 feet

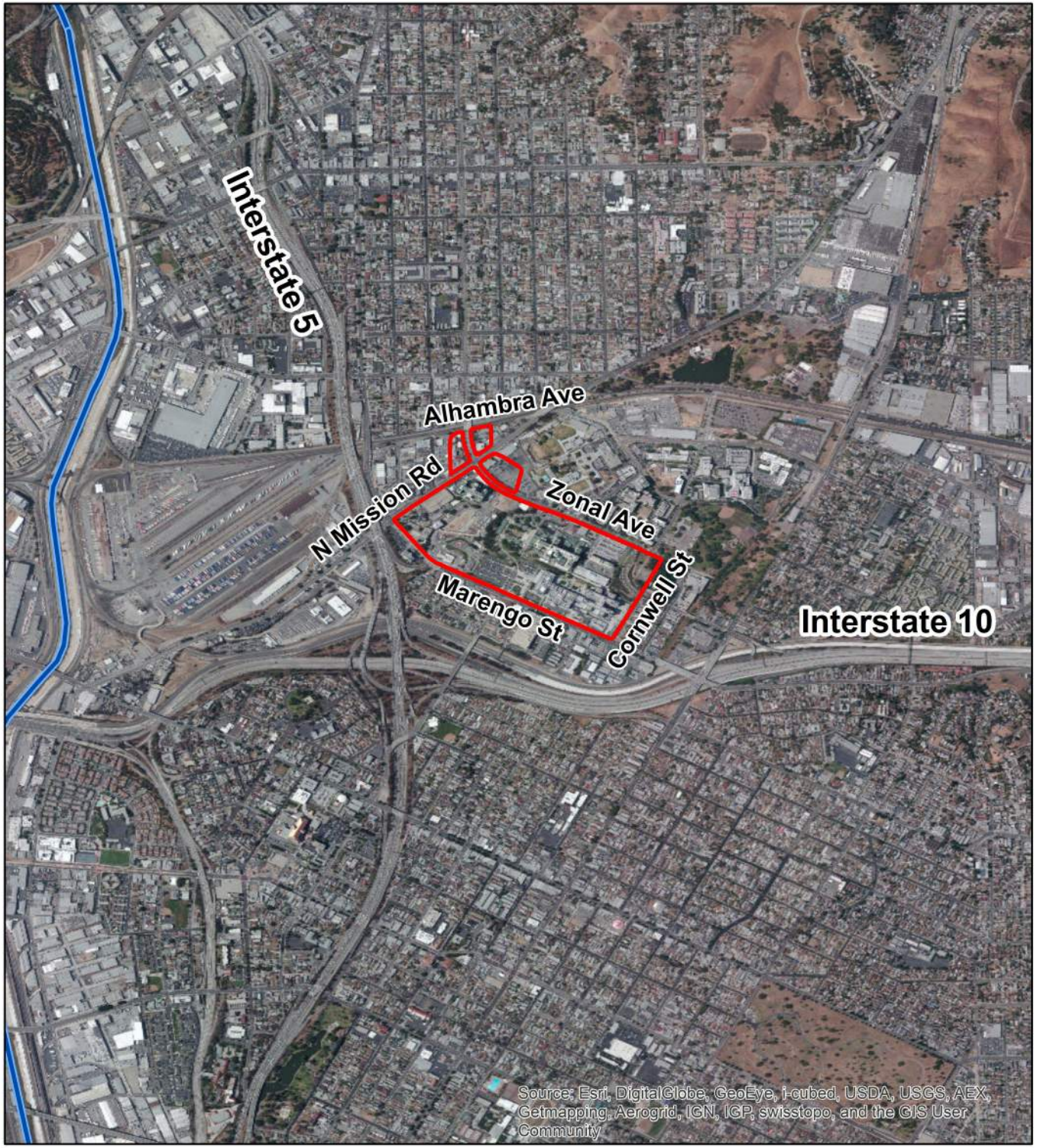
Legend

Project Boundary

Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 1
VICINITY MAP



North

Feet

0 1,250 2,500 5,000

1 inch = 2,000 feet

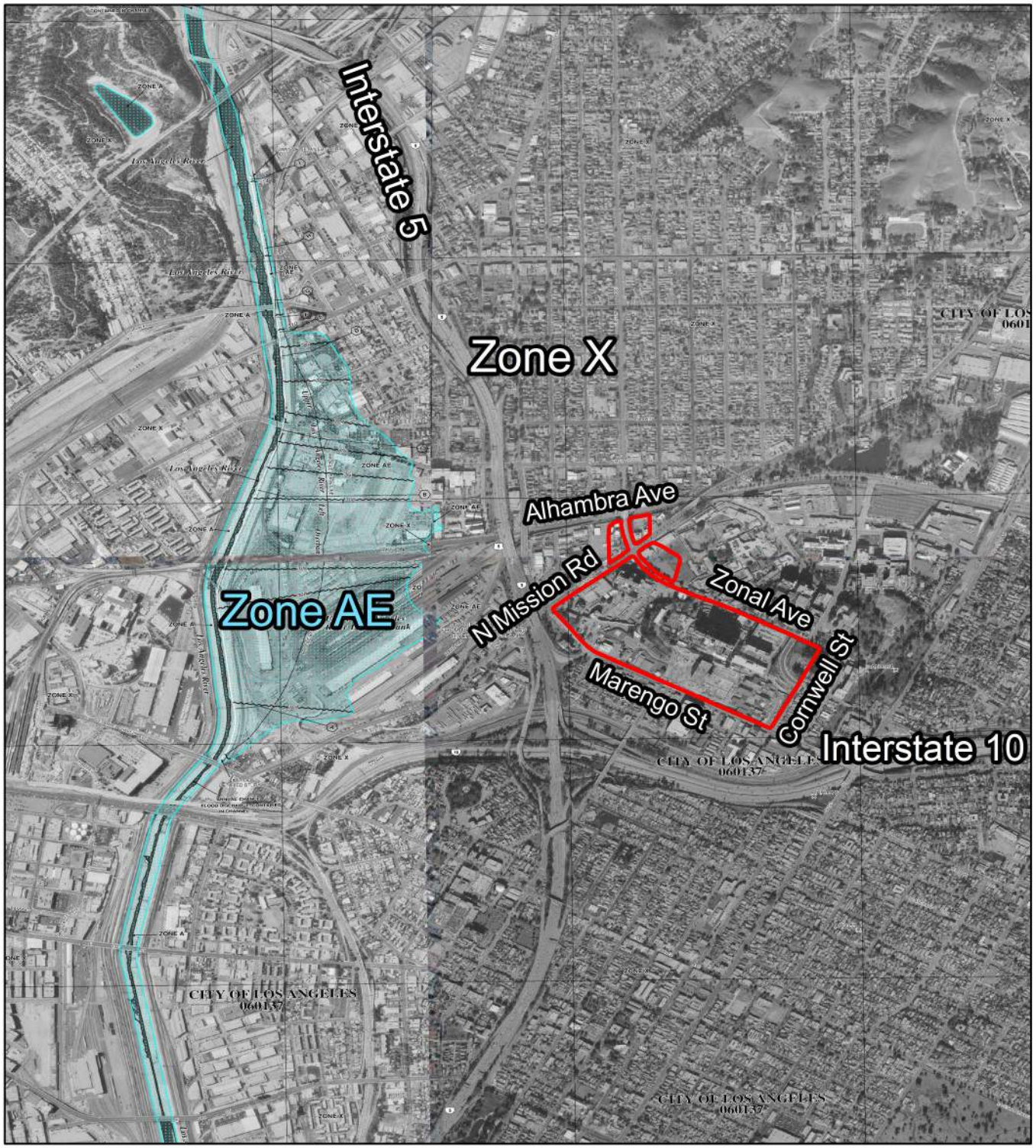
Legend

- Los Angeles River
- Project Boundary

Watearth™

LA+USC Medical Center Master Plan

EXHIBIT 2
AERIAL PHOTOGRAPH



North

0 1,200 2,400 4,800 Feet

1 inch = 2,000 feet

Legend

Project Boundary

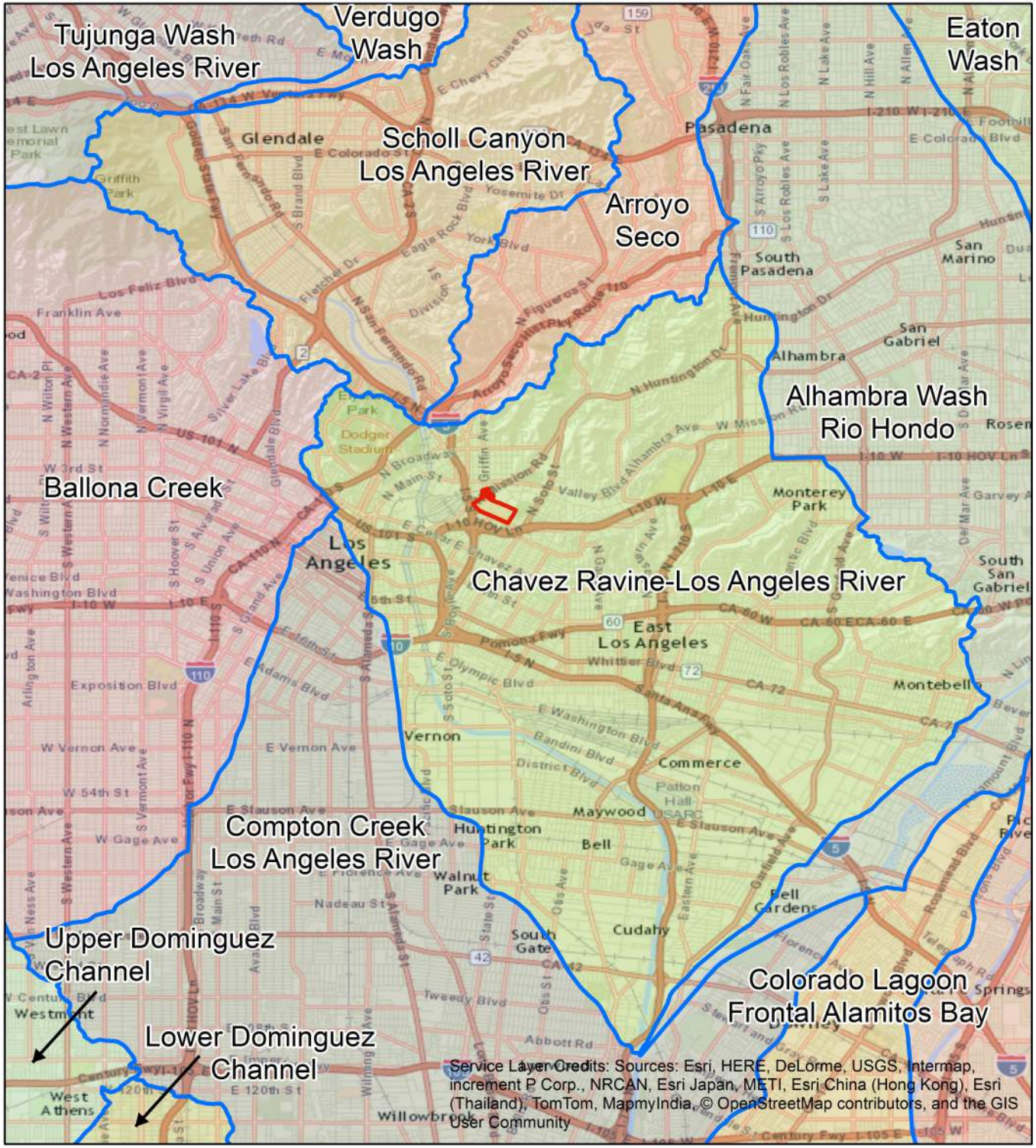
Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 3

FIRM PANELS

06037C1628F, 06037C1629F,
06037C1636F, 06037C1637F
Panels updated 9/26/2008



North

Feet

0 7,500 15,000 30,000

1 inch = 12,500 feet

Legend

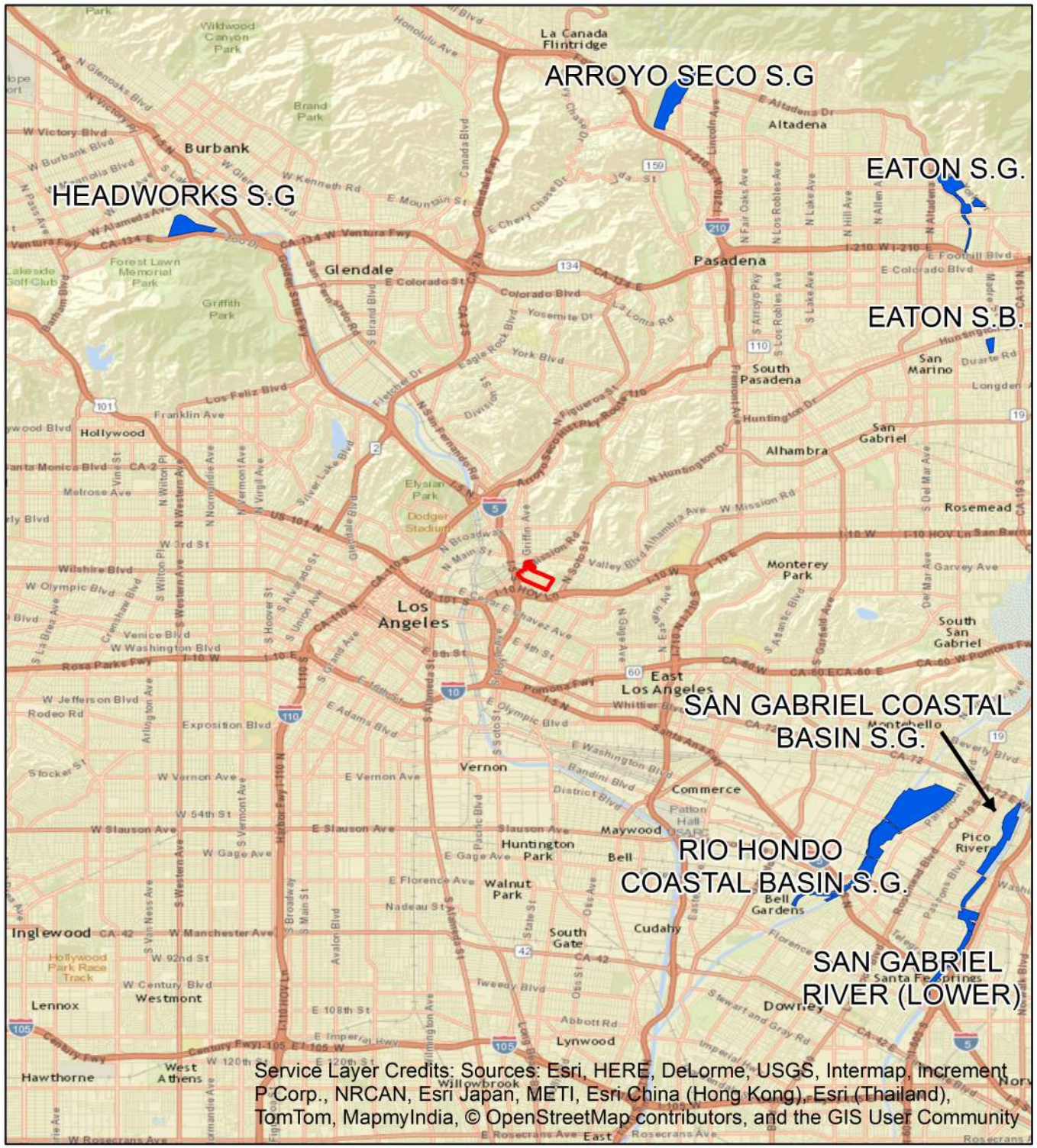
- USGS NHD Subwatershed
- Project Boundary

Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 4

Subwatershed Boundaries



North

Feet

0 9,000 18,000 36,000

1 inch = 15,000 feet

Legend

Spreading Grounds

Project Boundary

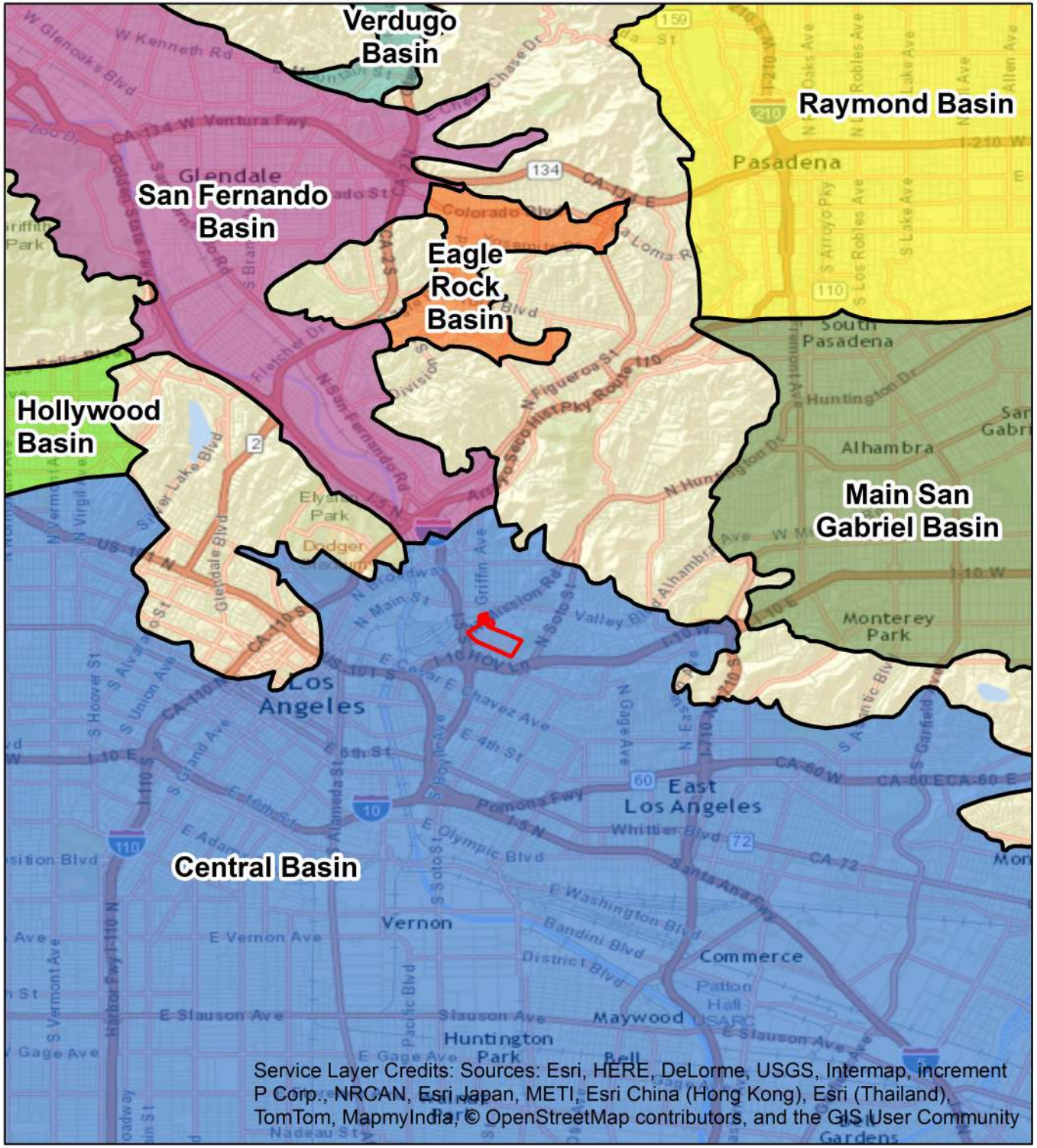
Watearth™

LA+USC Medical Center

EXHIBIT 5

Stormwater Spreading Grounds

Spreading Grounds data from Los Angeles Co. Dept. of Public Works



North

Feet

0 6,250 12,500 25,000

1 inch = 10,000 feet

Legend

- Ground Water Basins
- Project Boundary

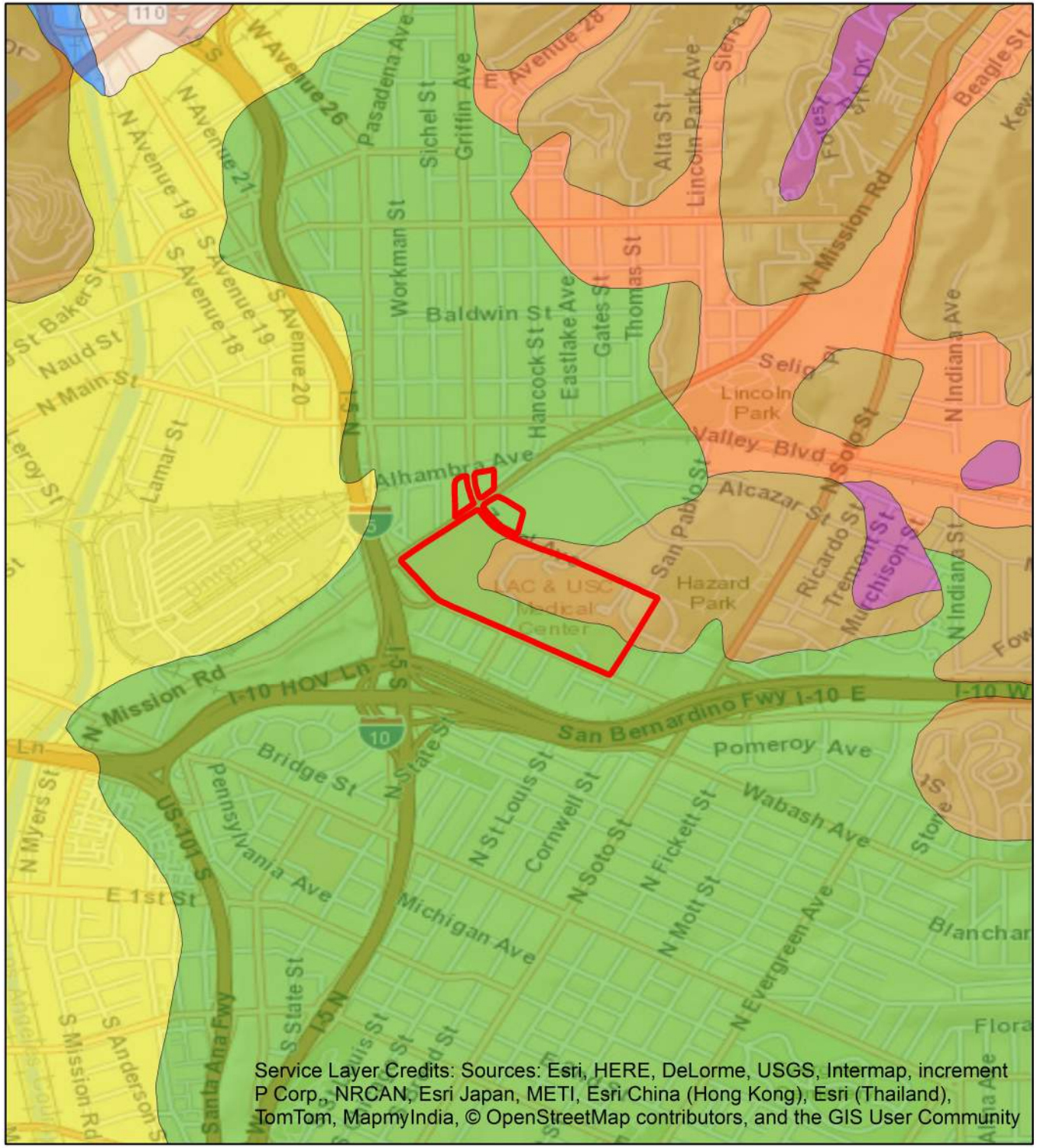
Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 6

Groundwater Basins

Ground water basin data from
Los Angeles Co. Dept. of Public Works



North

Feet

0 1,300 2,600 5,200

1 inch = 2,000 feet

- Project Boundary
- Altamont Clay Loam
- Ramona Loam
- Yolo Clay Loam
- Tujunga Fine Sandy Loam
- Handford Gravelly Sandy Loam
- Handford Fine Sandy Loam
- Diablo Clay Loam

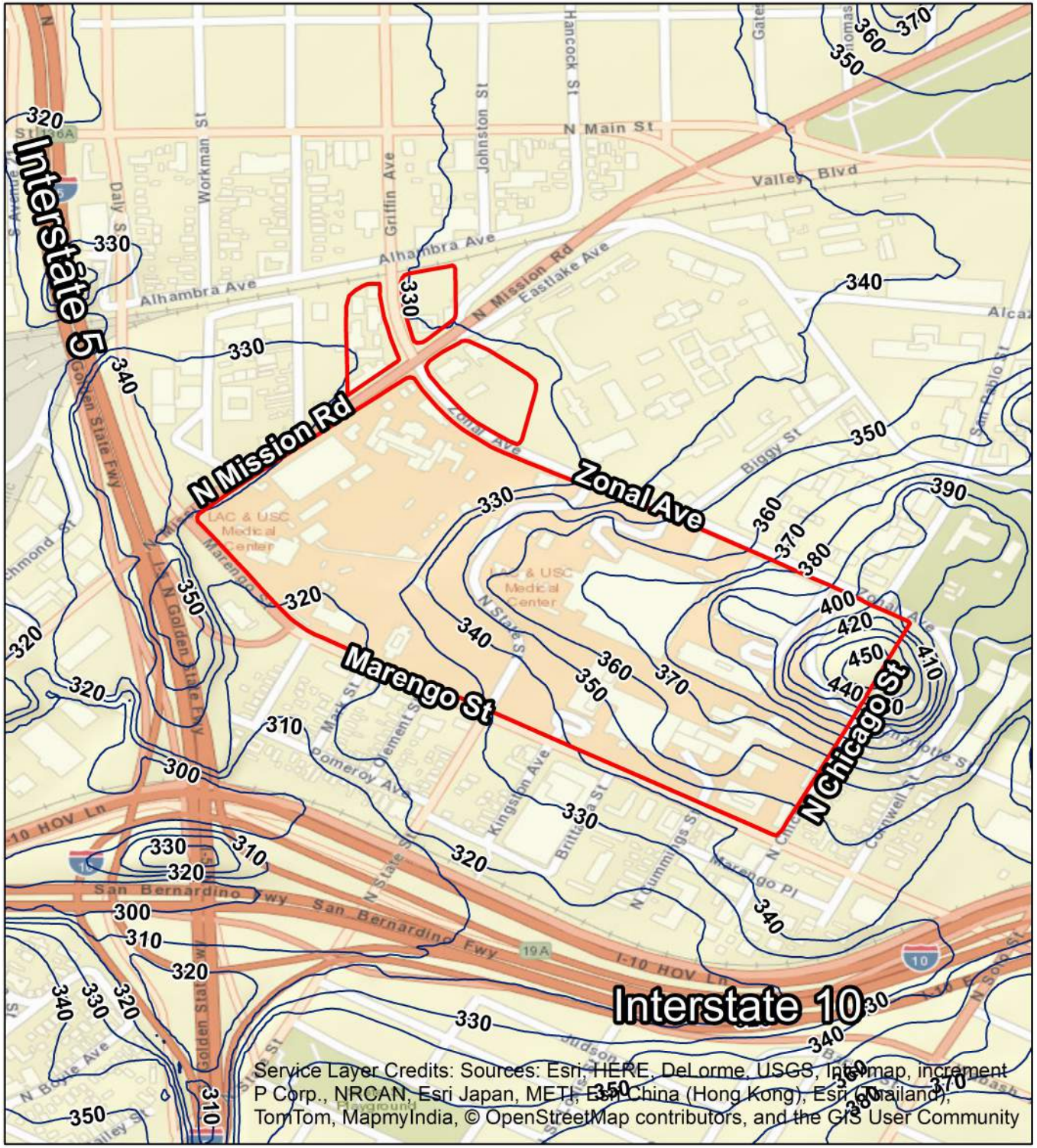
Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 7

Soil Types

Soil data from Los Angeles Co. Dept. of Public Works, Water Resources Division



North

0 500 1,000 2,000 Feet

1 inch = 750 feet

Legend

- Project Boundary
- 10ft Contour

Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 8

Topographic Map

Elevation data from
USGS National Elevation Dataset

APPENDIX A1 - LAC+USC MEDICAL CAMPUS PROPOSED STORMWATER CONVEYANCE CONCEPT PLANS

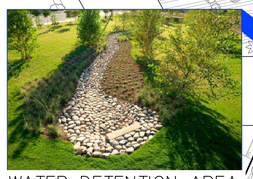
LAC+USC MEDICAL CAMPUS
PROPOSED STORMWATER CONVEYANCE CONCEPT PLANS

LOS ANGELES, CALIFORNIA

Kimley-Horn and Associates, Inc.

Engineering, Planning, and Environmental Consultants

765 The City Drive, Suite 200
Orange, California 92868 (714) 939-1030



WATER DETENTION AREA

BIOSWALE/RAINGARDENS

PERVIOUS PAVEMENT

Q_{25}=21.53 CFS, T_C=7 MIN
Q_{50}=24.35 CFS, T_C=7 MIN
Q_{100}=29.13 CFS, T_C=6 MIN
Q_{SUSMP}=1.47 CFS, T_C=28 MIN

Q_{25}=27.53 CFS, T_C=5 MIN
Q_{50}=31.12 CFS, T_C=5 MIN
Q_{100}=24.71 CFS, T_C=5 MIN
Q_{SUSMP}=1.83 CFS, T_C=21 MIN

Q_{25}=42.8 CFS, T_C=5 MIN
Q_{50}=48.48 CFS, T_C=5 MIN
Q_{100}=54.08 CFS, T_C=5 MIN
Q_{SUSMP}=2.20 CFS, T_C=22 MIN

Q_{25}=8.91 CFS, T_C=7 MIN
Q_{50}=10.82 CFS, T_C=6 MIN
Q_{100}=12.05 CFS, T_C=6 MIN
Q_{SUSMP}=0.63 CFS, T_C=26 MIN

Q_{25}=31.01 CFS, T_C=5 MIN
Q_{50}=35.05 CFS, T_C=5 MIN
Q_{100}=39.10 CFS, T_C=5 MIN
Q_{SUSMP}=1.69 CFS, T_C=23 MIN

Q_{25}=20.34 CFS, T_C=10 MIN
Q_{50}=24.09 CFS, T_C=9 MIN
Q_{100}=26.89 CFS, T_C=9 MIN
Q_{SUSMP}=1.59 CFS, T_C=30 MIN

Q_{25}=24.51 CFS, T_C=6 MIN
Q_{50}=27.66 CFS, T_C=6 MIN
Q_{100}=33.62 CFS, T_C=5 MIN
Q_{SUSMP}=1.70 CFS, T_C=23 MIN

Q_{25}=10.14 CFS, T_C=5 MIN
Q_{50}=11.47 CFS, T_C=5 MIN
Q_{100}=12.79 CFS, T_C=5 MIN
Q_{SUSMP}=0.79 CFS, T_C=15 MIN

ZONAL AVENUE
STATE ST.
BIGGY ST.
N. MISSION ROAD
SICHEL ST.
WORKMAN ST.
STATE STREET
N. CUMMINGS STREET
N. CHICAGO STREET
MARENGO STREET
LORD ST.
MARK ST.
CLEMENT ST.
STATE ST.
KINGSTON AVE.
BRITANNIA ST.
N. CUMMINGS ST.
CHICAGO ST.

PHASE 2 B-08
PHASE 2 B-06
PROPOSED CENTRAL PLANT
PHASE 2 P-IV A
PHASE 2 P-IV B HELIPAD
PHASE 2 B-07
PHASE 1 B-03
PHASE 1 B-01
PHASE 2 B-04
PHASE 1 B-02
X"S.D.

A1 14.8
A2 8.7
A3 9.5
A4 3.6
A5 10.7
A6 9.7
A7 9.2
A8 3.5

LEGEND:

- RIGHT-OF-WAY LINE
- CENTER LINE
- EXISTING OFF-SITE STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING BUILDING TO REMAIN
- PROPOSED BUILDING
- WETLAND/DETENTION AREA
- PERVIOUS PAVEMENT
- BIOSWALE AREA
- SUB-AREA LINE
- LONGEST FLOW PATH
- (X) FLOW PATH ANNOTATION
- (AX / X) HYDROLOGY SUB-AREA NUMBER AND ACREAGE
- HYDROLOGY AREA CONFLUENCE POINT
- DIRECTIONAL FLOW ARROW

NORTH

GRAPHIC SCALE IN FEET
0 40 80 160

APPENDIX B – TABLES OF MODELING DATA AND RESULTS

TABLE 1: LAC+USC MEDICAL CENTER EIR SUMMARY OF HYDROLOGIC PARAMETERS

Hydrologic Parameters																	
Area (ac)	24-hr Rainfall Data		Impervious Cover (%)			Overland Flow Length (ft)		Width (A/L) (ft)		Slope (%)			Depression Storage (in)		Manning's n-value Impervious	Manning's n-value Pervious		
	10-yr	100-yr	Undev	Exist	Prop	Undev	Exist & Prop	Undev	Exist & Prop	Undev	Exist	Prop	Impervious	Pervious		Undev	Exist	Prop
83.61	4.84	7.87	0.0%	95%	75.0%	500	200	7,284	18,210	4.8%	4.8%	4.8%	0.06	0.25	0.011	0.32	0.24	0.24

Notes:

1. Hydrologic modeling performed in EPA SWMM5.0.022.
2. Site assumed to route to outlet in undeveloped conditions and 0% disconnected impervious cover assumed in existing conditions as detailed topographic and grading data not available.
3. Undeveloped conditions assumed.
4. Tree canopy interception neglected as not significant for this project.
5. Evaporation data based on 1970 - 2006 data from Los Angeles Downtown/USC gauge obtained from the EPA National Stormwater Calculator.
6. Undeveloped Manning's n-value for pervious areas assumed between dense grass and woods with light underbrush. Existing Manning's n-value for pervious areas assumed as dense grass.
7. Proposed Manning's n-value for pervious areas assumed as dense grass or an approximate average between turf grass and native vegetation.
8. Continuous simulation model based on 1970 - 2006 data from Los Angeles Downtown/USC gauge obtained from the EPA National Stormwater Calculator.
9. Existing impervious cover of 95% approximated from aerial photograph and proposed impervious cover assumed from campus rendering from *Master Plan* .
10. Proposed includes ultimate redevelopment of LA+USC Medical Center with Low Impact Development (LID) features.
11. Existing slope assumed as typical site average and proposed slope assumed same as existing based on information in *Master Plan* . Since no data available, undeveloped slope assumed same as existing.
12. Overland flow length of 500 feet (ft) assumed as maximum for undeveloped conditions based on SWMM User's Manual. Existing and proposed conditions limited to 200 ft due to channelized flow on paved surfaces.
13. Rainfall data based on National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6 from the Ascot Reservoir gauge.

TABLE 2: LAC+USC MEDICAL CENTER EIR GREEN & AMPT SOILS PARAMETERS

Native Soil Green & Ampt Parameters			Growing Media Green & Ampt Parameters						
Suction Head (in)	Conductivity (in/hr)	Initial Deficit	Suction Head (in)	Conductivity (in/hr)	Initial Deficit	Field Capacity	Effective Porosity	Wilting Point	Conductivity Slope
5.885	0.085	0.305	2.4	1.18	0.382	0.105	0.437	0.047	8.0

Notes:

1. Native soil classified as Ramona Loam and Altamont Clay Loam from LA County soils and GIS data.
2. Suction head and hydraulic conductivity for native soil based on average of clay loam and loam values from EPA *SUSTAIN User's Manual*
3. Initial moisture deficit for Western U.S. assumed as average of clay loam and loam from www.water-research.net
4. Conductivity and suction head values assumed for growing media from EPA *SUSTAIN User's Manual* .
   The conductivity value was selected to simulate long-term saturated hydraulic conductivity in the event of loss of capacity over time.
5. Loamy sand classification assumed for growing media and depths shown on Table 4.
6. Conductivity slope assumed from standard tables in SWMM5.0.021 User's Manual based on sandy loam growing media.

TABLE 3: LAC+USC MEDICAL CENTER EIR LID FEATURES AREAS AND CONTRIBUTING AREAS

LID Feature	LID Area (sq. ft.)	Drainage Area/ Area Treated (ft^2)	Pervious Area Treated (ft^2)	Impervious Area Treated (ft^2)	% Impervious Area Treated	Outflow to Pervious
Bioretention	70,436	414,167	0	414,167	11%	No
Permeable Pavement	170,446	170,446	0	170,446	5%	No
Wetlands/Detention	31,804	68,681	0	68,681	2%	No
TOTALS		653,294	0	653,294	18%	

Notes:

1. Surface areas based on LAC+USC MEDICAL CAMPUS PROPOSED STORMWATER CONVEYANCE CONCEPT PLANS prepared by Kimley-Horn & Associates, Inc.
2. Total Area Treated = drainage area contributing to LID feature.
2. % impervious area treated is percent of impervious area in entire project drainage area as the aggregated method of LID modeling is used due to the site size.
3. Permeable pavement modeled as 100% impervious and perviousness and storage handled as an LID control.
4. Green roof (agricultural/urban farm) and cisterns for stormwater harvesting and use not included as they are not specifically programmed.

TABLE 4: LAC+USC MEDICAL CENTER EIR LID CONFIGURATIONS

LID Feature	Perm. Pvmt. Thickness (in)	Perm. Pvmt. Infilt. (in/hr)	Perm. Pvmt. Void Ratio	Avg. Surface Depth (in)	Surface Slope (%)	Top Width (ft)	Surface Veg. Volume Fraction	Manning's n-value	Depth Soil Media (in)	Initial Media Saturation (%)	Drain Rock (in)	Void Ratio	Underdrain?
Bioretention	---	---	---	18	---	25	0.05	---	36	0/50	12	0.5	yes
Permeable Pavement	4	100	0.18	---	2.00	50	---	0.011	---	0/50	24	0.5	yes
Wetlands/Detention	---	---	---	48	---	50	0.05	---	24	0/50	---	---	no

Notes:

1. Green & Ampt hydraulic parameters for growing media (amended soil) based on sandy loam with a hydraulic conductivity of 1.18 in/hr (see Table 2 for details).
2. Hydraulic conductivity of 0.085 in/hr assumed for underlying (native) soil (see Table 2 for details).
3. No clogging assumed on permeable pavement (i.e., maintenance at appropriate intervals assumed).
4. Initial media saturation used for design storm events only and not continuous simulation model.
5. Surface depth and growing media depth for bioretention and wetlands/detention based on required two to three feet from February, 2014 County of Los Angeles Department of Public Works *Low Impact Development Standards Manual* .
6. Wetlands/detention modeled as bioretention due to planning-level nature of analysis.
7. Thickness of porous asphalt and void ratio of gravel reservoir assumed.
8. Permeable pavement infiltration rate assumed and void ratio based on average between typical range of 0.12 - 0.21 from SWMM5.0.022 documentation.
9. Slope of 2% for permeable pavement assumed as located in flatter portions of site.
10. Manning's n-value for permeable pavement based on typical asphalt n-values.
11. 4-inch underdrains in Permeable Pavement and Bioretention assumed to be elevated 6 inches above bottom of gravel reservoir.
12. Void ratios assumed for gravel storage reservoirs.

TABLE 4A: LAC+USC MEDICAL CENTER EIR STORMWATER QUALITY VOLUME

LID Feature	Storage Volume (cu. ft.)			
	Surface Storage	Growing Media	Drain Rock	Total
Bioretention	2.43	1.46	0.42	4.30
Permeable Pavement	0.00	0.00	2.03	2.03
Wetlands/Detention	1.46	1.46	0.00	2.92
TOTAL	3.89	2.92	2.46	9.26
REQUIRED	6.62			6.62
EXCESS/DEFICIT	-2.73			2.64

Notes:

1. Surface areas based on LAC+USC MEDICAL CAMPUS PROPOSED STORMWATER CONVEYANCE CONCEPT PLANS prepared by Kimley-Horn & Associates, Inc.
2. Water quality volume required based on 0.95-inch 85th-percentile, 24-hour rainfall event.
3. Storage volumes approximate based on surface area of LID features. Final designs may need to vary to meet required stormwater quality volumes.
4. Effective porosities of 30% and 26% used for growing media and drain rock, respectively. Effective porosites based on data in NCSU *Urban Waterways* article entitled Designing Bioretention with an Internal Water Storage (IWS) Layer.

TABLE 5: LAC+USC MEDICAL CENTER EIR DESIGN STORM EVENTS RESULTS

System Results	10-yr, 24-hr Design Storm					100-yr, 24-hr Design Storm				
	Undev.	Exist.	Prop.	% from Undev.	% from Exist.	Undev.	Exist.	Prop.	% from Undev.	% from Exist.
Initial LID Storage (in)	---	---	0.402	---	---	---	---	0.402	---	---
Precipitation (in)	4.540	4.540	4.540	0%	0%	7.140	7.140	7.140	0%	0%
Surface Runoff (in)	3.655	4.322	3.543	-3%	-18%	3.062	6.901	5.953	94%	-14%
Infiltration (in)	0.878	0.177	1.121	28%	533%	4.066	0.198	1.219	-70%	516%
Evaporation (in)	0.008	0.047	0.045	---	-4%	0.013	0.047	0.046	---	-2%
Peak Flows (cfs)	30.9	205.5	154.7	401%	-25%	98.8	328.1	252.9	156%	-23%

Notes:

1. Undeveloped conditions refers to historical site with no development.
2. Existing conditions refers to current conditions at site with existing development.
3. Proposed conditions is proposed ultimate build-out of *Master Plan* facilities with LID features.
4. Initial LID Storage due to assumed 50% saturation used in design storm models.

TABLE 6: LAC+USC MEDICAL CENTER EIR
CONTINUOUS SIMULATION WATER BALANCE OUTPUT

System Results	Analysis Period Results			Difference Between LID Model and Other Conditions			
	Undeveloped	Existing	Proposed	vs. Undeveloped	vs. Existing	% from Undeveloped	% from Existing
Precipitation (in)	570.79	570.79	570.79	0.00	0.00	0%	0%
Surface Runoff (in)	46.59	494.94	323.42	276.84	-171.51	594%	-35%
Infiltration (in)	521.49	25.39	192.27	-329.22	166.87	-63%	657%
Evaporation (in)	2.86	51.54	56.74	53.88	5.20	1881%	10%

Notes:

1. Water balance output is for full continuous simulation run.
2. Initial saturation of 0% (wilting point) used for growing media at start of continuous simulation run.
3. Undeveloped conditions refers to historical site with no development.
4. Existing conditions refers to current conditions at site with existing development.
5. Proposed conditions is proposed ultimate build-out of *Master Plan* facilities with LID features.

TABLE 7: LAC+USC MEDICAL CENTER EIR NUMBER OF RUNOFF EVENTS FROM CONTINUOUS SIMULATION ANALYSIS

Run	Number Runoff Events
Undeveloped Conditions	131
Existing Conditions	1,052
Proposed LID Conditions	991

Notes:

1. 589 precipitation events ≥ 0.10 in.
2. 6-hour inter-event duration used.

APPENDIX C – EPA SWMM WATER BUDGET RESULTS

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------


***********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
***********************************************************

***************
Analysis Options
***************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... GREEN_AMPT
Starting Date ............ JAN-01-2000 00:00:00
Ending Date .............. JAN-03-2000 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 00:05:00


*************************        Volume         Depth
Runoff Quantity Continuity     acre-feet        inches
*************************     ---------       -------
Total Precipitation ......        31.632         4.540
Evaporation Loss .........         0.054         0.008
Infiltration Loss ........        25.463         3.655
Surface Runoff ...........         6.121         0.878
Final Surface Storage ....         0.000         0.000
Continuity Error (%) .....        -0.018


**************************
Subcatchment Runoff Summary
**************************

-----------------------------------------------------------------------------------------------------------
                         Total      Total      Total      Total      Total       Total     Peak  Runoff
                        Precip      Runon       Evap      Infil     Runoff      Runoff   Runoff   Coeff
Subcatchment                in         in         in         in         in    10^6 gal      CFS
-----------------------------------------------------------------------------------------------------------
LA+USC                    4.54       0.00       0.01       3.65       0.88        1.99    30.85   0.193


Analysis begun on:  Sun Jul 13 05:32:37 2014
Analysis ended on:  Sun Jul 13 05:32:37 2014
Total elapsed time: < 1 sec
```

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-2000 00:00:00
Ending Date JAN-03-2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	31.632	4.540
Evaporation Loss	0.327	0.047
Infiltration Loss	1.232	0.177
Surface Runoff	30.112	4.322
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.124	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	4.54	0.00	0.05	0.18	4.32	9.81	205.49	0.952

Analysis begun on: Sun Jul 13 05:24:08 2014
Analysis ended on: Sun Jul 13 05:24:08 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-2000 00:00:00
Ending Date JAN-03-2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Initial LID Storage	2.804	0.402
Total Precipitation	31.632	4.540
Evaporation Loss	0.311	0.045
Infiltration Loss	7.808	1.121
Surface Runoff	24.689	3.543
Final Surface Storage	1.672	0.240
Continuity Error (%)	-0.124	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	4.54	0.00	0.04	1.12	3.54	8.04	154.70	0.780

****
LID Performance Summary
****

Subcatchment	LID Control	Total Inflow in	Evap Loss in	Infil Loss in	Surface Outflow in	Drain Outflow in	Init. Storage in	Final Storage in	Po Er
LA+USC	Wetlands/Detention	11.69	0.14	4.09	0.00	0.00	4.68	12.15	
LA+USC	PermeablePavement	7.87	0.13	3.94	0.00	7.81	4.00	0.00	-
LA+USC	Bioretention	22.29	0.14	4.09	0.00	20.20	9.02	6.92	-0

Analysis begun on: Mon Jul 14 14:25:07 2014
Analysis ended on: Mon Jul 14 14:25:07 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-2000 00:00:00
Ending Date JAN-03-2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	49.748	7.140
Evaporation Loss	0.091	0.013
Infiltration Loss	28.332	4.066
Surface Runoff	21.336	3.062
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.023	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	7.14	0.00	0.01	4.07	3.06	6.95	98.84	0.429

Analysis begun on: Mon Jul 14 14:34:39 2014
Analysis ended on: Mon Jul 14 14:34:39 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-2000 00:00:00
Ending Date JAN-03-2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	49.748	7.140
Evaporation Loss	0.329	0.047
Infiltration Loss	1.381	0.198
Surface Runoff	48.084	6.901
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.093	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	7.14	0.00	0.05	0.20	6.90	15.67	328.14	0.967

Analysis begun on: Mon Jul 14 14:31:38 2014
Analysis ended on: Mon Jul 14 14:31:38 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-2000 00:00:00
Ending Date JAN-03-2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Initial LID Storage	2.804	0.402
Total Precipitation	49.748	7.140
Evaporation Loss	0.321	0.046
Infiltration Loss	8.493	1.219
Surface Runoff	41.475	5.953
Final Surface Storage	2.317	0.333
Continuity Error (%)	-0.101	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	7.14	0.00	0.05	1.22	5.95	13.51	252.86	0.834

****
LID Performance Summary
****

Subcatchment	LID Control	Total Inflow in	Evap Loss in	Infil Loss in	Surface Outflow in	Drain Outflow in	Init. Storage in	Final Storage in	Po Er
LA+USC	Wetlands/Detention	18.42	0.14	4.09	0.00	0.00	4.68	18.88	
LA+USC	PermeablePavement	12.40	0.13	3.94	0.02	12.32	4.00	0.00	-
LA+USC	Bioretention	35.15	0.14	4.09	0.00	31.35	9.02	8.67	-0

Analysis begun on: Mon Jul 14 14:27:16 2014
Analysis ended on: Mon Jul 14 14:27:16 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-1970 00:00:00
Ending Date DEC-31-2006 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

****
Rainfall File Summary
****

Station ID	First Date	Last Date	Recording Frequency	Periods w/Precip	Periods Missing	Periods Malfunc.
045115	JAN-09-1970	DEC-27-2006	60 min	7468	0	0

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	3976.951	570.786
Evaporation Loss	19.953	2.864
Infiltration Loss	3633.484	521.490
Surface Runoff	324.597	46.587
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.027	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	570.79	0.00	2.86	521.49	46.59	105.77	78.18	0.082

Analysis begun on: Sun Jul 13 07:29:52 2014
Analysis ended on: Sun Jul 13 07:29:57 2014
Total elapsed time: 00:00:05

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-1970 00:00:00
Ending Date DEC-31-2006 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

****
Rainfall File Summary
****

Station ID	First Date	Last Date	Recording Frequency	Periods w/Precip	Periods Missing	Periods Malfunc.
045115	JAN-09-1970	DEC-27-2006	60 min	7468	0	0

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	3976.951	570.786
Evaporation Loss	359.099	51.539
Infiltration Loss	176.927	25.393
Surface Runoff	3448.476	494.937
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.190	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	570.79	0.00	51.54	25.39	494.94	1123.65	108.03	0.867

Analysis begun on: Sun Jul 13 07:24:33 2014
Analysis ended on: Sun Jul 13 07:24:38 2014
Total elapsed time: 00:00:05

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-1970 00:00:00
Ending Date DEC-31-2006 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

****
Rainfall File Summary
****

Station ID	First Date	Last Date	Recording Frequency	Periods w/Precip	Periods Missing	Periods Malfunc.
045115	JAN-09-1970	DEC-27-2006	60 min	7468	0	0

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	3976.951	570.786
Evaporation Loss	395.353	56.742
Infiltration Loss	1339.615	192.266
Surface Runoff	2253.459	323.424
Final Surface Storage	0.084	0.012
Continuity Error (%)	-0.291	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	570.79	0.00	56.74	192.27	323.42	734.27	87.88	0.567

****
LID Performance Summary
****

Subcatchment	LID Control	Total Inflow in	Evap Loss in	Infil Loss in	Surface Outflow in	Drain Outflow in	Init. Storage in	Final Storage in	Po Er
LA+USC	Wetlands/Detention	1394.91	498.62	897.73	0.00	0.00	0.00	0.00	

LA+USC	PermeablePavement	955.23	33.20	849.72	0.00	82.63	0.00	0.00	-
LA+USC	Bioretention	2617.43	682.84	1381.41	0.00	563.01	0.00	0.62	-0

Analysis begun on: Mon Jul 14 13:22:50 2014
Analysis ended on: Mon Jul 14 13:23:02 2014
Total elapsed time: 00:00:12

APPENDIX C – SITE PHOTOGRAPHS

Photo 1: Los Angeles River Sign on East Cesar Chavez Avenue Crossing Near Mission Road

Photo 2: Los Angeles River Looking North from East Cesar Chavez Avenue Crossing Near Mission Road

Photo 3: Los Angeles River Looking North from East Cesar Chavez Avenue Crossing Near Mission Road

Photo 4: Los Angeles River Looking North from East Cesar Chavez Avenue Crossing Near Mission Road

Photo 5: Storm Drain Inlet Along Zonal Avenue

Photo 6: Storm Drain Inlet Along Zonal Avenue

Photo 7: Storm Drain Inlet Along Zonal Avenue

Photo 8: Storm Drain Inlet Along Zonal Avenue

Photo 9: Storm Drain Inlet Along Zonal Avenue

Photo 10: 1744 Zonal Avenue

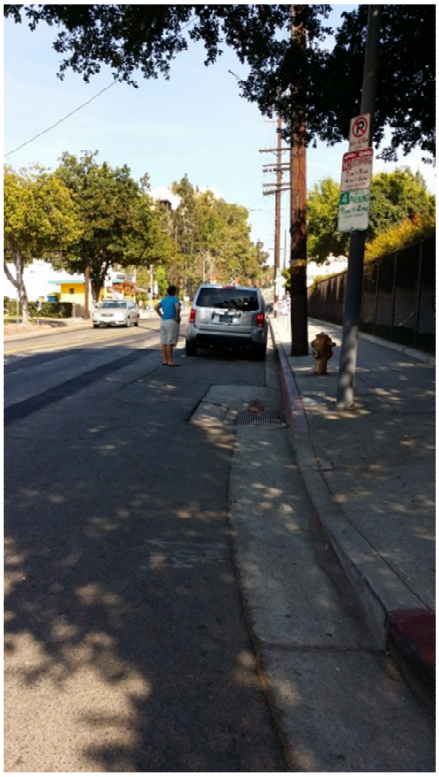


Photo 11: Storm Drain Inlet Along Zonal Avenue

Photo 12: Storm Drain Inlet Along Zonal Avenue

Photo 13: Storm Drain Inlet Along Zonal Avenue

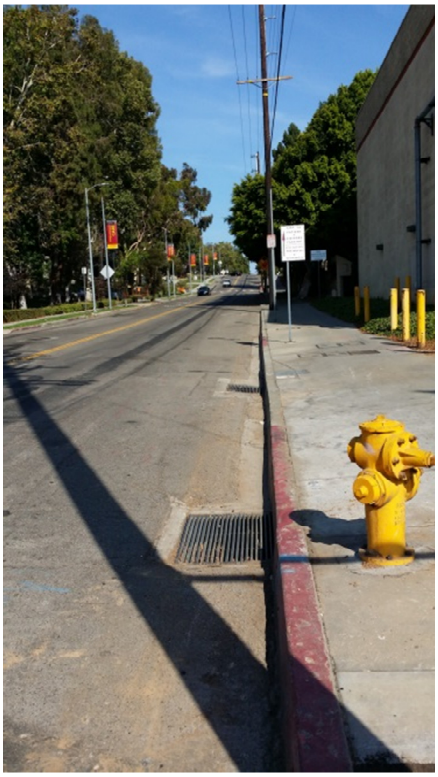


Photo 14: Storm Drain Inlet Along Zonal Avenue

Photo 15: Storm Drain Inlet Along Zonal Avenue

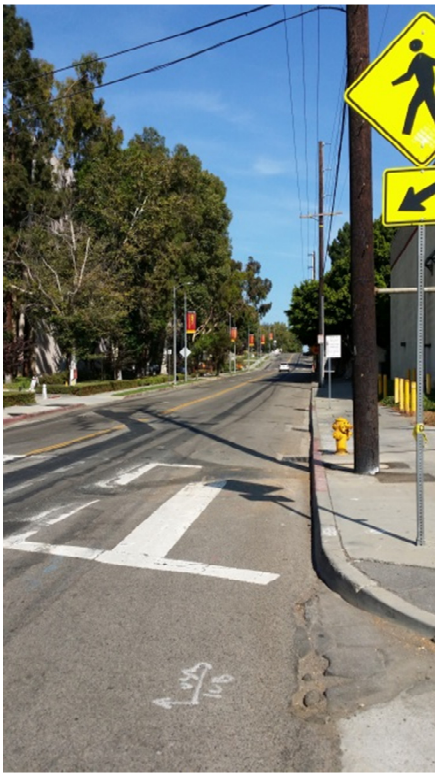


Photo 16: Storm Drain Inlet Along Zonal Avenue

Photo 17: Storm Drain Inlet Along Zonal Avenue at Biggy Street Intersection

Photo 18: Storm Drain Inlet Along Zonal Avenue at Biggy Street Intersection

Photo 19: Storm Drain Inlet Along Zonal Avenue

Photo 20: Storm Drain Inlet Along Zonal Avenue

Photo 21: Storm Drain Inlet Along Zonal Avenue

Photo 22: Storm Drain Inlet Along Cornwell Street at Marengo Street Intersection

Photo 23: Storm Drain Inlet Along Marengo Street

Photo 24: Intersection of Cornwell Street and Marengo Street

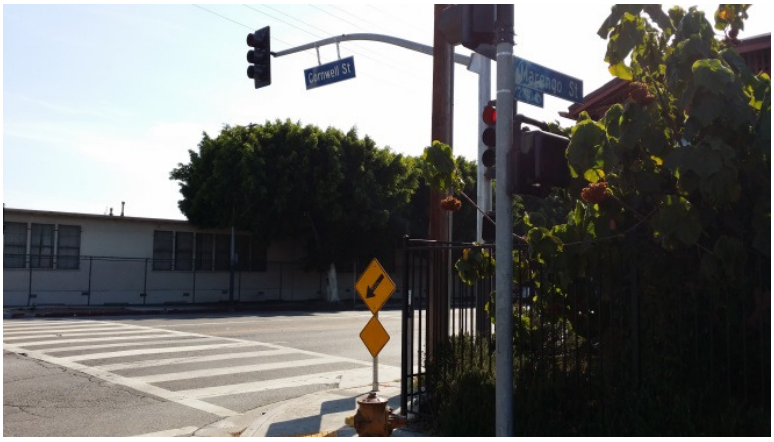


Photo 25: Intersection of Cornwell Street and Marengo Street

Photo 26: Storm Drain Inlet Along Marengo Street

Photo 27: Storm Drain Inlet with Screens Along Marengo Street

Photo 28: Storm Drain Inlet Along Marengo Street

Photo 29: Storm Drain Inlet with Screens Along Marengo Street

Photo 30: Storm Drain Inlet Along Marengo Street

Photo 31: Storm Drain Inlet with Screens Along Marengo Street

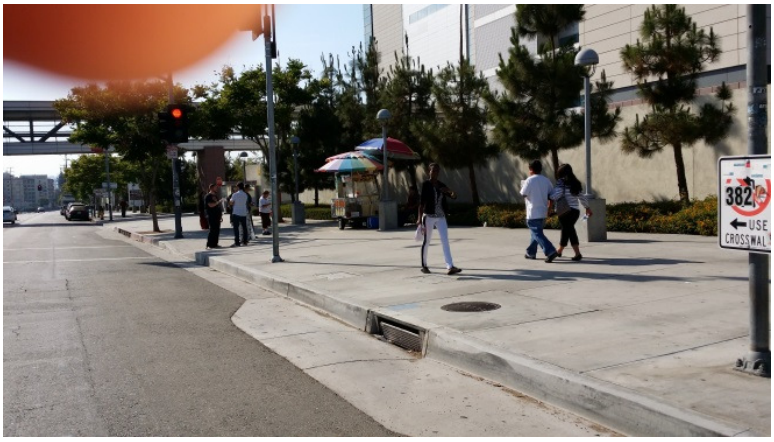


Photo 32: Storm Drain Inlet with Screens Along Marengo Street

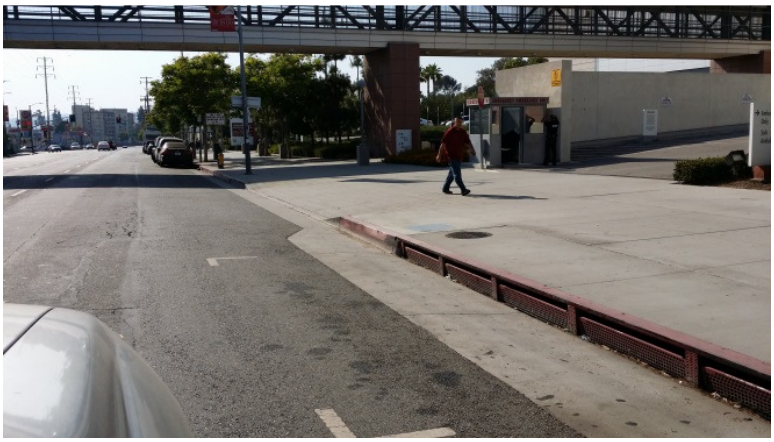


Photo 33: Storm Drain Inlet with Screens Along Marengo Street

Photo 34: Intersection of Marengo Street and Kingston

Photo 35: Storm Drain Inlet Along Marengo Street

Photo 36: Storm Drain Inlet with Screens Along Marengo Street

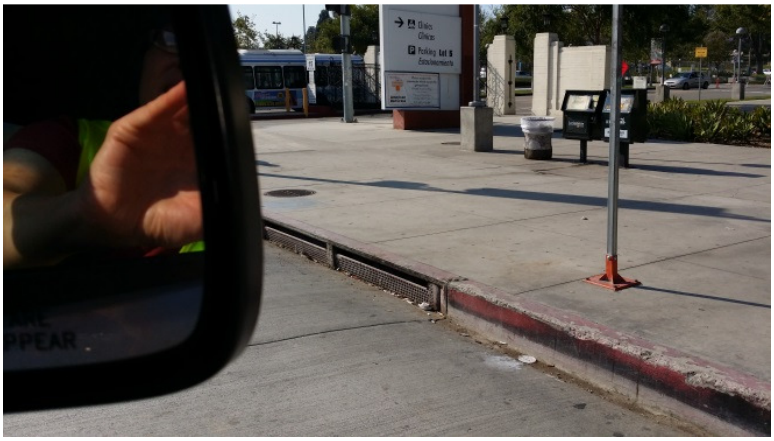


Photo 37: Storm Drain Inlet with Screens Along Marengo Street

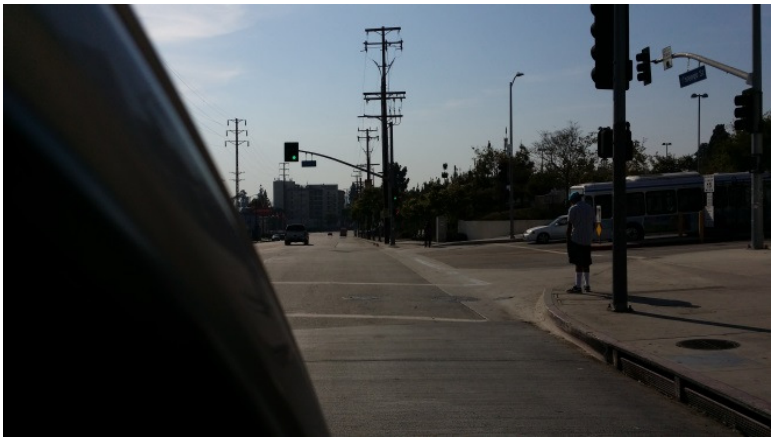


Photo 38: Storm Drain Inlet with Screens Along Marengo Street at State Street Intersection

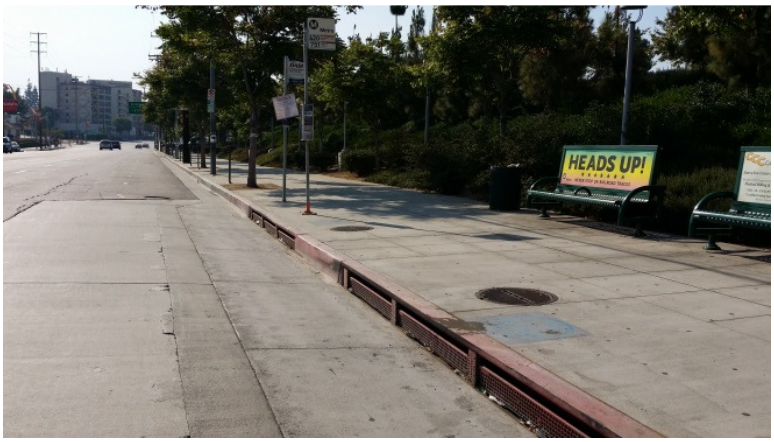


Photo 39: Storm Drain Inlet with Screens Along Marengo Street

Photo 40: Storm Drain Inlet with Screens Along Marengo Street

Photo 41: Storm Drain Inlet with Screens Along Marengo Street

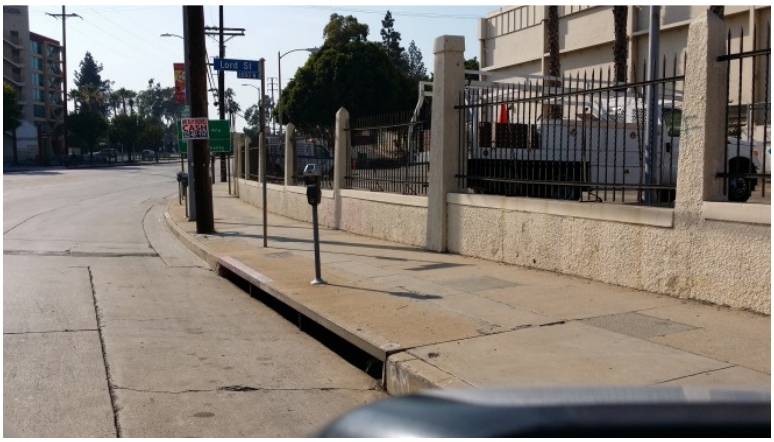


Photo 42: Storm Drain Inlet Along Marengo Street at Lord Street Intersection

Photo 43: Storm Drain Inlet Along Mission Road

Photo 44: Storm Drain Inlet Along Mission Road

Photo 45: Storm Drain Inlet with Screens Along Mission Road

Photo 46: No Dumping Stencil at Storm Drain Inlet Along Mission Road

Photo 47: Looking at Off-Site Portion of Site from Intersection of Zonal Avenue and Mission Road

Photo 48: Looking at Off-Site Portion of Site from Intersection of Zonal Avenue and Mission Road

Photo 49: Looking at Off-Site Portion of Site from Intersection of Zonal Avenue and Mission Road

Photo 50: Looking at Off-Site Portion of Site from Intersection of Zonal Avenue and Mission Road

Photo 51: Looking at Zonal Avenue to West from Intersection of Zonal Avenue and Mission Road

Photo 52: Looking at Off-Site Portion of Site from Intersection of Zonal Avenue and Mission Road

Photo 53: Looking Along Zonal Avenue Near Intersection with Cummings

Photo 54: Looking Along Zonal Avenue Near Intersection with Cummings

Photo 55: Looking Off-Site Towards Hazard Park

Photo 56: Looking Off-Site Towards Hazard Park

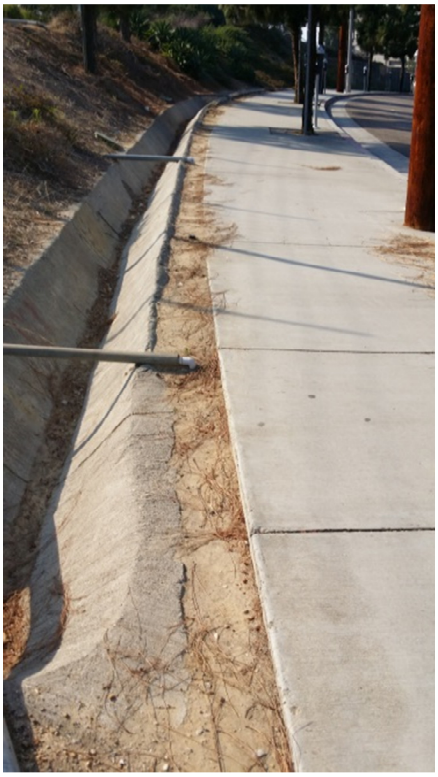


Photo 57: Looking at Concrete Conveyance Swale Along Cornwell that Flows Perpendicular to Slope of "the Hill" in Northeastern Portion of Site

Photo 58: Hazard Park to Right Along Cornwell Street

Photo 59: Looking at Concrete Conveyance Swale Running Perpendicular to Slope of "the Hill" in Northeastern Portion of Site

Photo 60: Looking at Existing Vegetation on "the Hill" in Northeastern Portion of Site

Photo 61: Looking at Existing Vegetation on "the Hill" in Northeastern Portion of Site

Photo 62: Looking at Concrete Conveyance Swale Running Perpendicular to Slope of "the Hill" in Northeastern Portion of Site

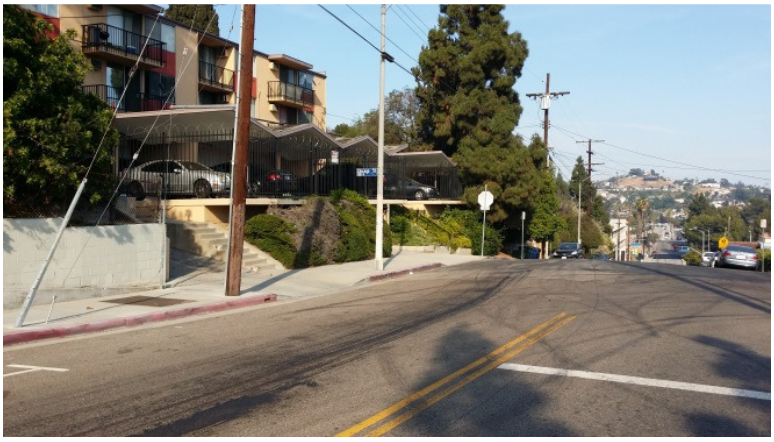


Photo 63: Looking Along Cornwell

Photo 64: Looking at Existing Vegetation and Bare Soil on "the Hill" in Northeastern Portion of Site

Photo 65: Looking at Existing Vegetation and Bare Soil on "the Hill" in Northeastern Portion of Site

Photo 66: Looking at Existing Vegetation on "the Hill" in Northeastern Portion of Site

Photo 67: Looking at Existing Vegetation and Bare Soil on "the Hill" in Northeastern Portion of Site

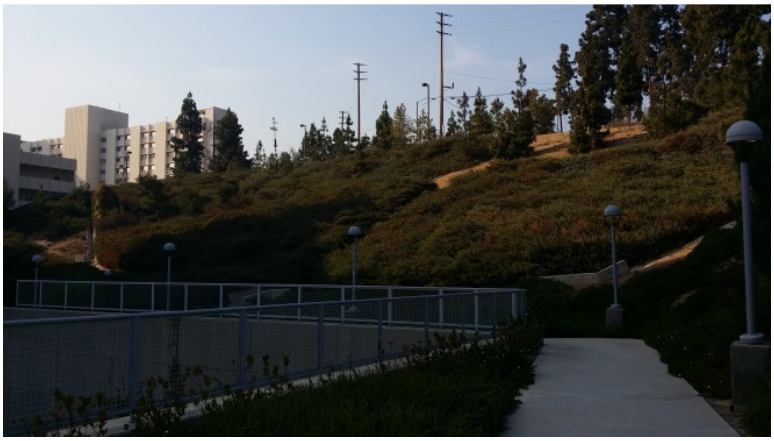


Photo 68: Looking at Existing Vegetation and Bare Soil on "the Hill" in Northeastern Portion of Site

Photo 69: Looking at Existing Vegetation and Bare Soil on "the Hill" in Northeastern Portion of Site

Photo 70: Looking at Existing Vegetation and Bare Soil on "the Hill" in Northeastern Portion of Site

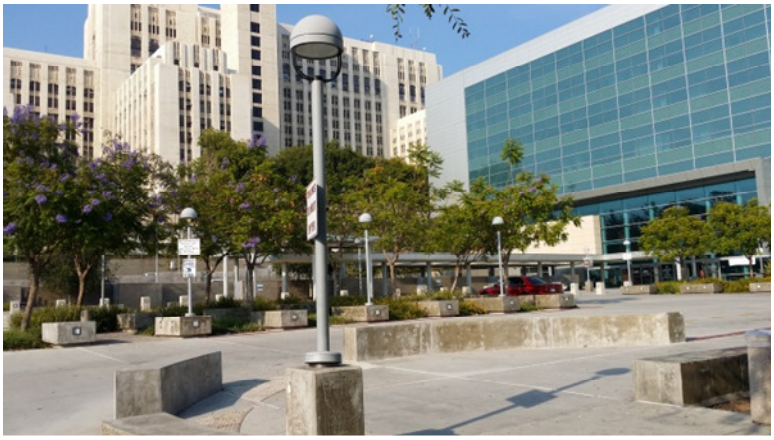


Photo 71: Looking at Existing Vegetation from State Street within LAC+USC Medical Center

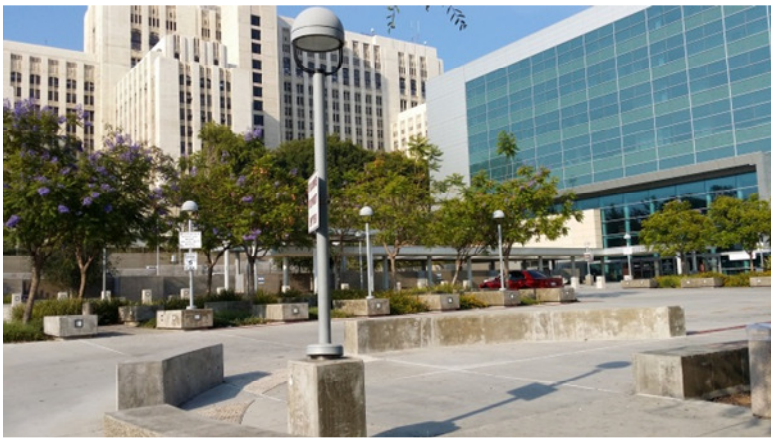


Photo 72: Looking at Existing Vegetation from State Street within LAC+USC Medical Center

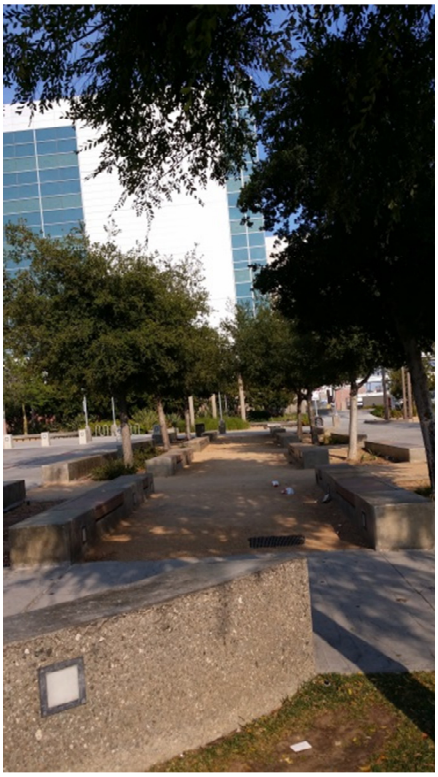


Photo 73: Looking at Existing Vegetation from State Street within LAC+USC Medical Center

Photo 74: Looking at Existing Vegetation from State Street within LAC+USC Medical Center

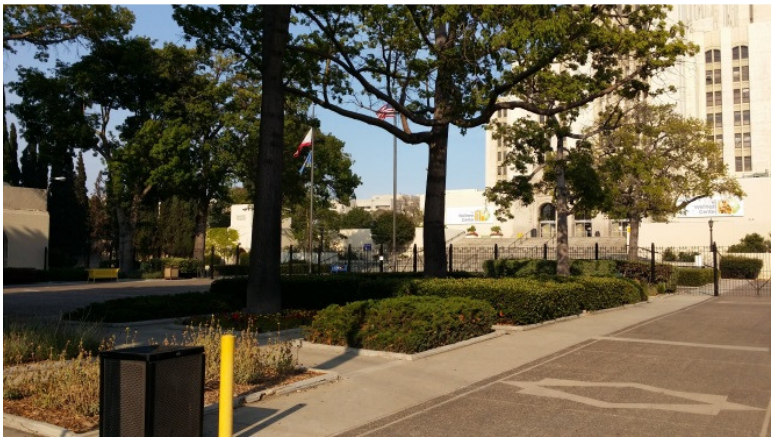


Photo 75: Looking at Existing Vegetation from State Street within LAC+USC Medical Center

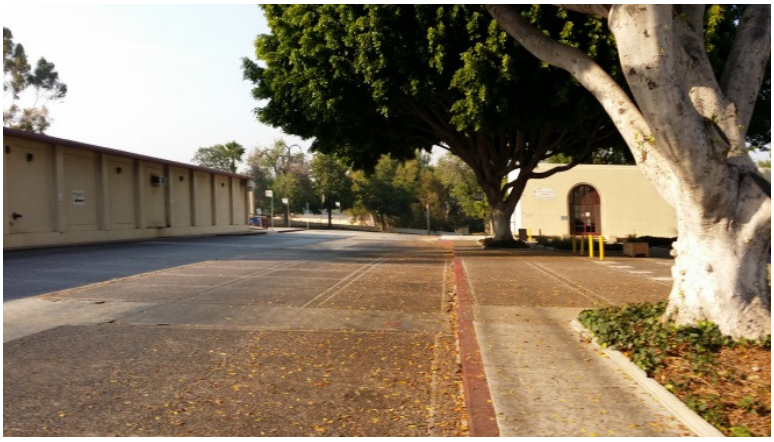


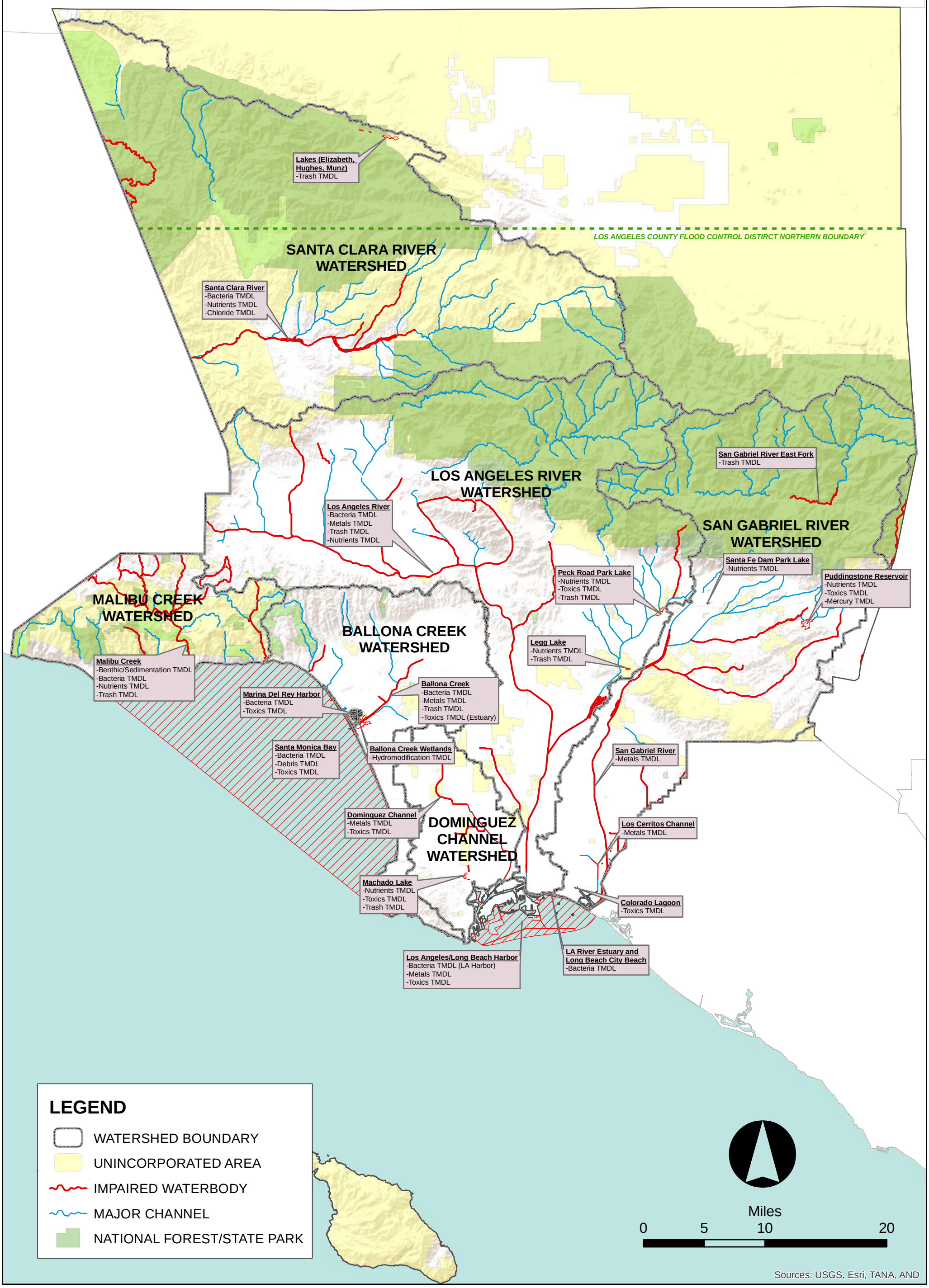
Photo 76: Looking to North on State Street within LAC+USC Medical Center

APPENDIX D – LOS ANGELES RIVER TMDLS AND WATERSHED MANAGEMENT POLLUTANTS OF CONCERN

COUNTY OF LOS ANGELES

MAJOR WATERSHEDS and EFFECTIVE TOTAL MAXIMUM DAILY LOADS

(as of October 2013)



APPENDIX B

Tier 3 Pollutants of Concern

BALLONA CREEK WATERSHED MANAGEMENT AREA

Parameter	Parameter
pH	Cyanide, Total Recoverable
E. coli Bacteria	Copper, Total Recoverable
Total Coliform Bacteria[1]	Lead, Total Recoverable
Fecal Coliform Bacteria[1]	Mercury, Total Recoverable
Enterococcus Bacteria[1]	Selenium, Total Recoverable

[1] Apply only to discharges to the estuary and the ocean

DOMINGUEZ CHANNEL WATERSHED MANAGEMENT AREA

Parameter	Parameter
pH	Cyanide, Total Recoverable
E. coli Bacteria	Copper, Total Recoverable
Total Coliform Bacteria[1]	Lead, Total Recoverable
Fecal Coliform Bacteria[1]	Mercury, Total Recoverable
Enterococcus Bacteria[1]	Selenium, Total Recoverable

[1] Apply only to discharges to the estuary and the ocean

LOS ANGELES RIVER WATERSHED MANAGEMENT AREA

Parameter	Parameter
pH	Total Dissolved Solids
E. coli Bacteria	Turbidity
Total Coliform Bacteria[1]	Aluminum, Total Recoverable
Fecal Coliform Bacteria[1]	Cyanide, Total Recoverable
Enterococcus Bacteria[1]	Copper, Total Recoverable
Chloride	Mercury, Total Recoverable
Nitrite Nitrogen, Total (as N)	Selenium, Total Recoverable
Sulfate	

[1] Apply only to discharges to the estuary and the ocean

MALIBU CREEK WATERSHED MANAGEMENT AREA

Parameter	Parameter
E. coli Bacteria	Total Dissolved Solids
Cyanide, Total Recoverable	
Mercury, Total Recoverable	
Selenium, Total Recoverable	
Sulfate	

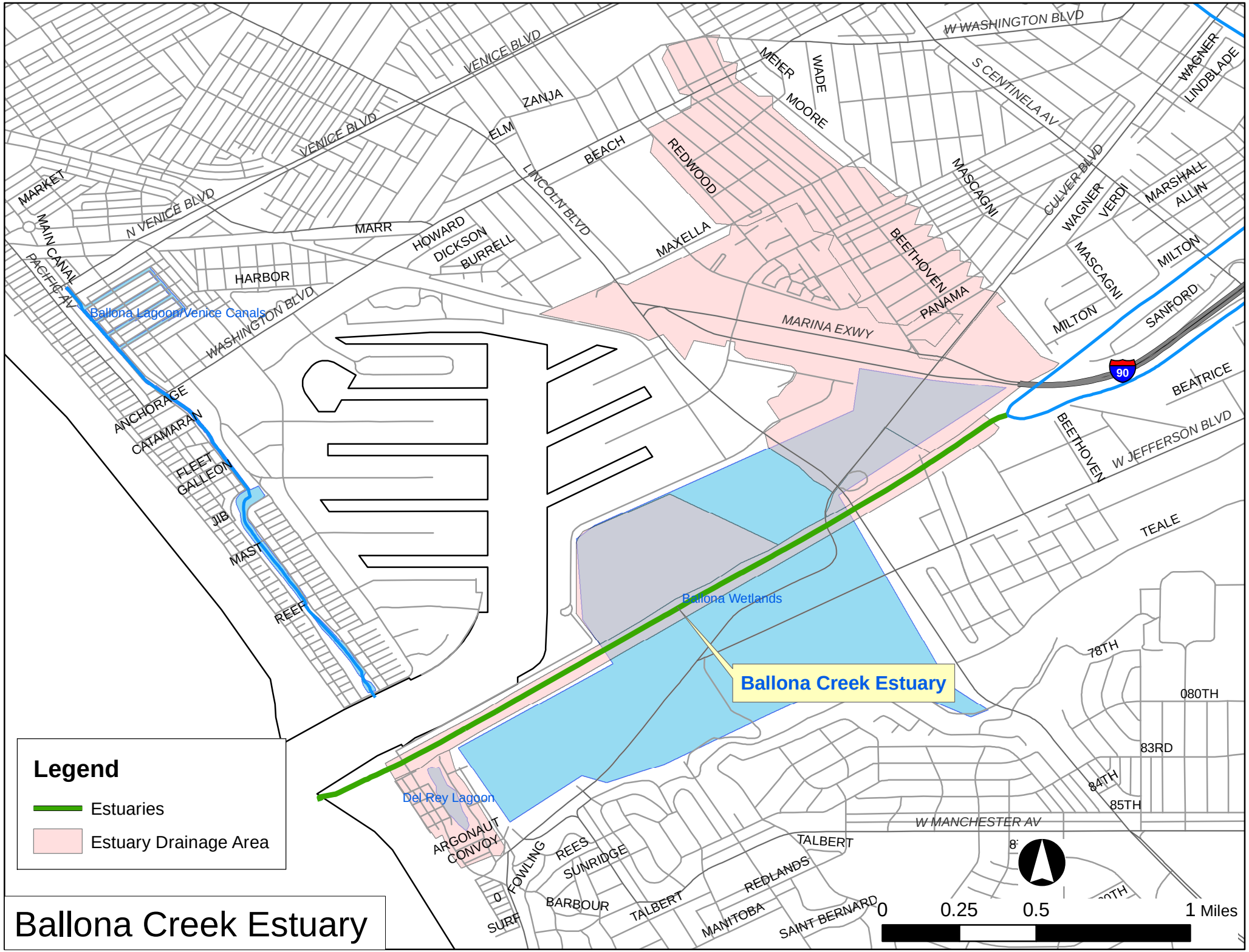
SAN GABRIEL RIVER WATERSHED MANAGEMENT AREA

Parameter	Parameter
pH	Cyanide, Total Recoverable
E. coli Bacteria	Cadmium, Total Recoverable
Total Coliform Bacteria[1]	Copper, Total Recoverable
Fecal Coliform Bacteria[1]	Lead, Total Recoverable
Enterococcus Bacteria[1]	Mercury, Total Recoverable
Chloride	Nickel, Total Recoverable
Nitrate Nitrogen, Total (as N)	Selenium, Total Recoverable
Sulfate	Silver, Total Recoverable
Total Dissolved Solids	Zinc, Total Recoverable
Aluminum, Total Recoverable	

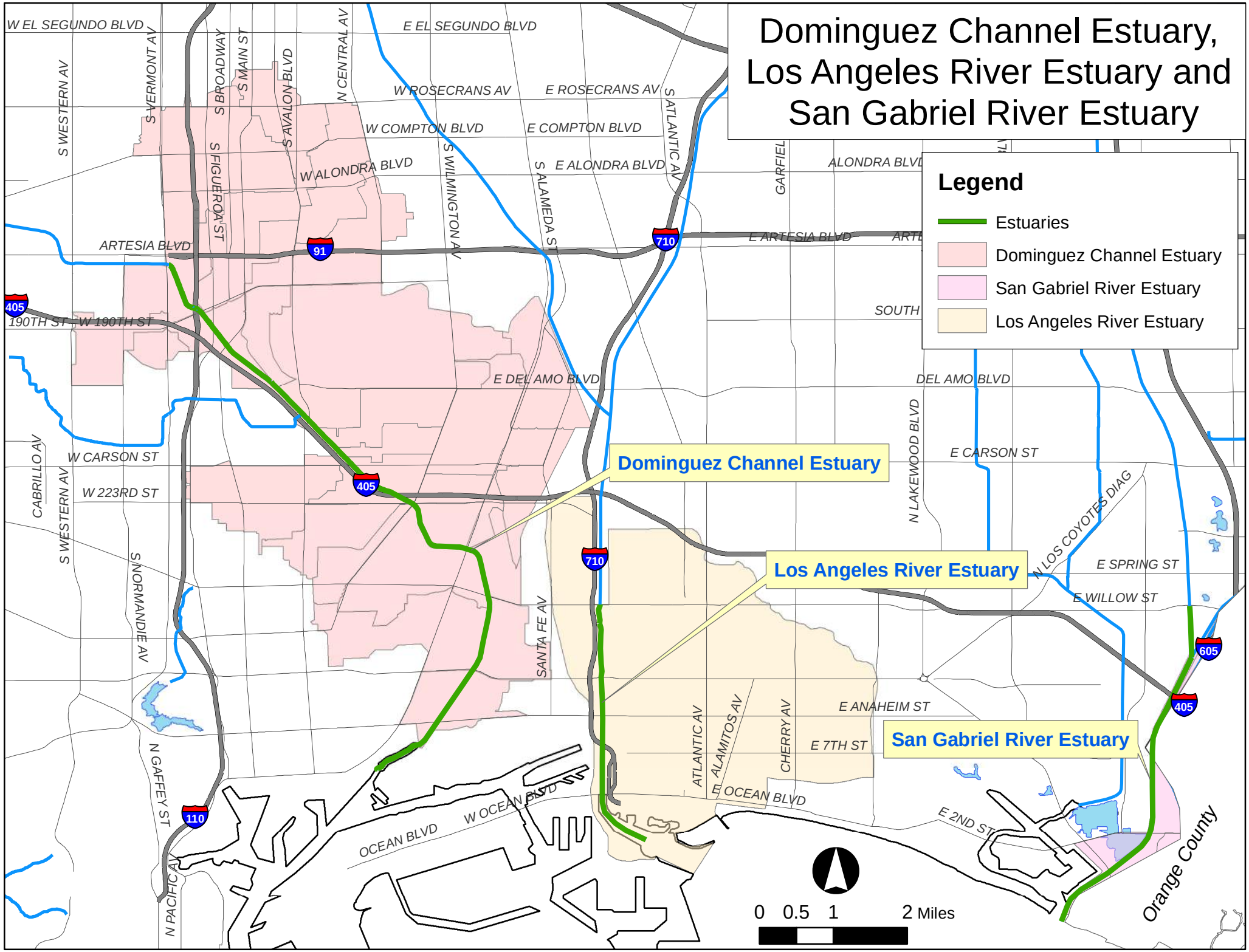
[1] Apply only to discharges to the estuary and the ocean

SANTA CLARA RIVER WATERSHED AREA (LA County portion only)

Parameter	Parameter
E. coli Bacteria	Aluminum, Total Recoverable
Chloride	Cyanide, Total Recoverable
Sulfate	Copper, Total Recoverable
Total Dissolved Solids	Mercury, Total Recoverable
Methylene Blue Active Substances	Selenium, Total Recoverable



Ballona Creek Estuary



Document Name: Basin Plan_LAR-DC

APPENDIX E – LOCATION OF HISTORIC UNDERGROUND ARROYO DE LA PASA RIVER

FINAL

LOS ANGELES COUNTY+ UNIVERSITY OF SOUTHERN CALIFORNIA (LAC+USC) MEDICAL CENTER REPLACEMENT PROJECT

ENVIRONMENTAL ASSESSMENT / ENVIRONMENTAL IMPACT REPORT

SEISMIC HAZARD MITIGATION PROGRAM FOR HOSPITALS

DSR # 47463, 47464, 47465, 47466

P.A. ID # 037-91033

June 2000

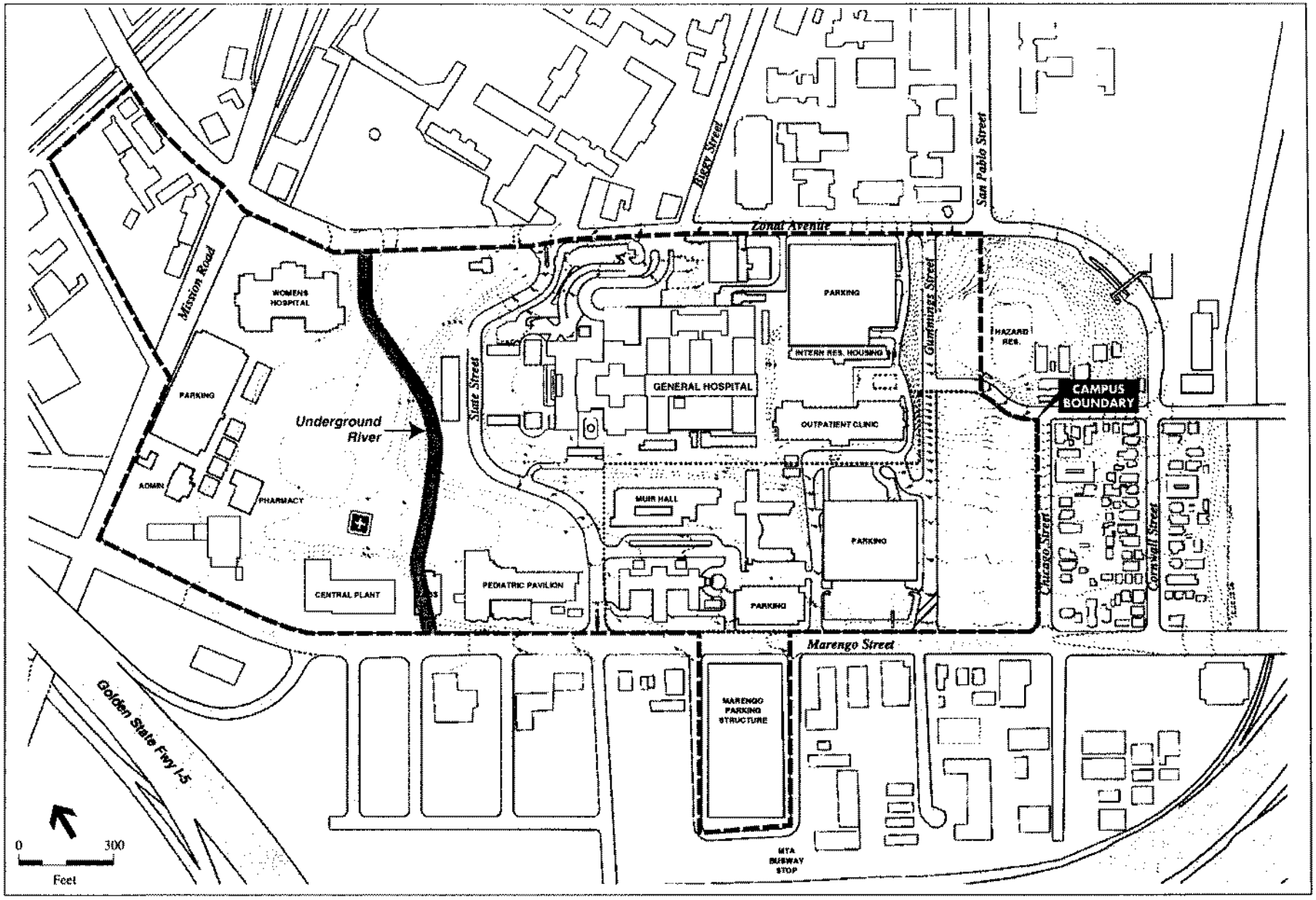
Prepared by:

Environmental Science Associates
4221 Wilshire Boulevard, Los Angeles, CA 90010-3512

for

Emergency Management Agency
Parsons East Annex
Third Floor
75 N. Fairoaks Avenue
Pasadena, CA 91103

County of Los Angeles
Department of Public Works
LAC+USC Medical Center Replacement Project
2000 Zonal Avenue, 7th Floor
Los Angeles, CA 90033



SOURCE: Hellmuth Obata Kassabaum + Lee Burkhart Liu. 1998.

Exhibit 35

Location of Historic Underground River
Arroyo De La Pasa

APPENDIX F – LOCATION OF PETROLEUM CONTAMINATED GROUNDWATER SITES

Phase I Environmental Site Assessment
Report Issuance Date: October 21, 2013

LAC+USC Medical Center
1744 Zonal Avenue
Los Angeles, Los Angeles County, California

Brownfield Assessment Grant BF-00T53201-0

Prepared for:

Lee, Burkhart, Liu, Inc.
13335 Maxella Avenue
Marina del Rey, CA 90292

And

Los Angeles County
Chief Executive Office
754 Hall of Administration
500 West Temple Street
Los Angeles, CA 90012

Prepared by:

Kimley-Horn and Associates, Inc.
765 The City Drive
Suite 200
Orange, CA 92686

Kimley-Horn
and Associates, Inc.

Project No. 094633002

Phase I Environmental Site Assessment Report

LAC+USC Medical Center
1744 Zonal Avenue
Los Angeles, Los Angeles County, California

Brownfield Assessment Grant BF-00T53201.0

Prepared for:
Lee, Burkhart, Liu, Inc.
13335 Maxella Avenue
Marina del Rey, CA 90292

And

Los Angeles County
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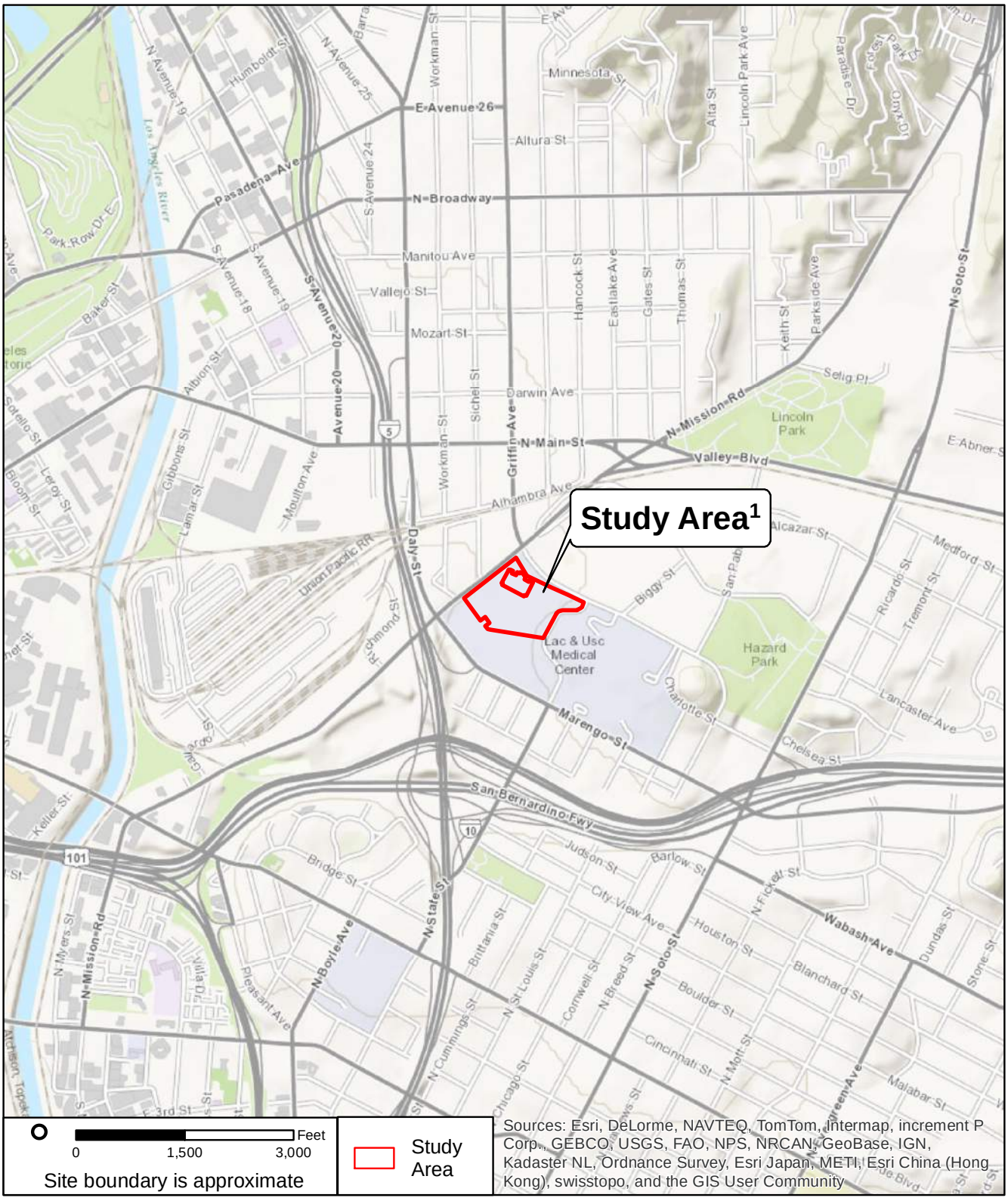


Kimley-Horn and Associates, Inc.

765 The City Drive, Ste 200
Orange, CA 92868
Phone: (714) 939-1030

Vicinity Map

1200 N. State Street
Los Angeles County, California

PHASE I ESA | FIGURE 1

[1] Women and Children's Hospital Excluded from Study Area

Kimley-Horn and Associates, Inc.
765 The City Drive, Ste 200
Orange, CA 92868
Phone: (714) 939-1030

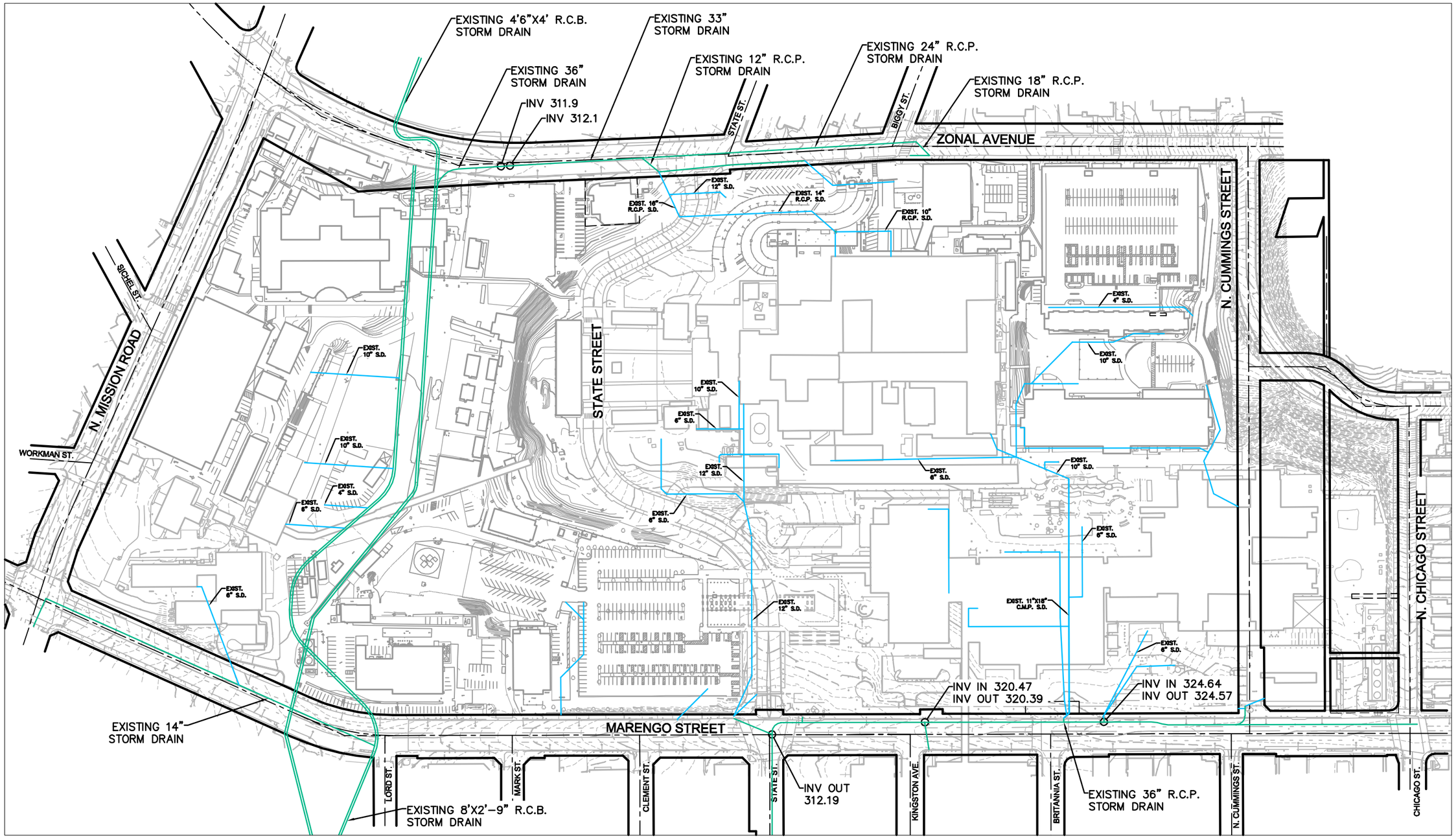
REC Location Map

1200 N. State Street
Los Angeles County, California

PHASE I ESA

FIGURE 6

APPENDIX G – EXISTING AND PROPOSED STORM DRAIN CONVEYANCE PLANS FROM MASTER PLAN



LAC+USC MEDICAL CAMPUS
EXISTING STORM DRAIN
CONVEYANCE CONCEPT PLANS

LOS ANGELES, CALIFORNIA

LEGEND:

- RIGHT-OF-WAY LINE
- CENTER LINE
- EXISTING ON-SITE STORM DRAIN TO PROTECT IN PLACE
- EXISTING OFF-SITE STORM DRAIN TO PROTECT IN PLACE

NORTH

GRAPHIC SCALE IN FEET
0 40 80 160

Kimley-Horn and Associates, Inc.

Engineering, Planning, and Environmental Consultants
765 The City Drive, Suite 200
Orange, California 92868 (714) 939-1030

LAC+USC MEDICAL CAMPUS
PROPOSED STORM DRAIN
CONVEYANCE CONCEPT PLANS

LOS ANGELES, CALIFORNIA

EXISTING 4'6"X4' R.C.B. STORM DRAIN
EXISTING 33" STORM DRAIN
EXISTING 36" STORM DRAIN
INV 311.9
INV 312.1
EXISTING 12" R.C.P. STORM DRAIN
EXISTING 24" R.C.P. STORM DRAIN
EXISTING 18" R.C.P. STORM DRAIN
STATE ST.
BIGGY ST.
ZONAL AVENUE
N. CUMMINGS STREET
N. CHICAGO STREET
SICKEL ST.
N. MISSION ROAD
WORKMAN ST.
STATE STREET
PHASE 2 B-08
PHASE 2 B-06
PROPOSED CENTRAL PLANT
PHASE 2 P-IV A
PHASE 2 P-IV B HELIPAD
PHASE 2 B-07
PROPOSED S.D.
PHASE 1 B-03
PHASE 1 B-01
PHASE 2 B-04
PHASE 1 B-02
EXISTING 14" STORM DRAIN
INV IN 320.47
INV OUT 320.39
INV IN 324.64
INV OUT 324.57
MARENGO STREET
LORD ST.
MARK ST.
CLEMENT ST.
STATE ST.
INV OUT 312.19
KINGSTON AVE.
BRITANNIA ST.
EXISTING 36" R.C.P. STORM DRAIN
N. CUMMINGS ST.
CHICAGO ST.
EXISTING 8'X2'-9" R.C.B. STORM DRAIN

LEGEND:

- RIGHT-OF-WAY LINE
- CENTER LINE
- EXISTING ON-SITE STORM DRAIN TO PROTECT IN PLACE
- EXISTING OFF-SITE STORM DRAIN TO PROTECT IN PLACE
- STORM DRAIN TO BE REMOVED
- PROPOSED STORM DRAIN (PHASE 1 DEVELOPMENT)
- PROPOSED STORM DRAIN (MASTER DEVELOPMENT PHASE)
- EXISTING BUILDING TO REMAIN
- PROPOSED BUILDING

NORTH

GRAPHIC SCALE IN FEET
0 40 80 160

Kimley-Horn and Associates, Inc.

Engineering, Planning, and Environmental Consultants
765 The City Drive, Suite 200
Orange, California 92868 (714) 939-1030

APPENDIX H – TABLE OF EXISTING STORM DRAIN SYSTEMS FROM MASTER PLAN

Project: LAC+USC Medical Campus Master Plans

Existing Onsite Potable Water, Fire System, and Irrigation System Utility

BUILDING NAME	Water Service	Fire System Service	Irrigation Service
Original Hospital Building	4"		2"
Parking Structure (Corner of Marengo and N. Chicago)		6"	
Psychiatric Hospital	8"		2" & 3"
Pediatric Pavilion	6" & 2"	6"	1"
General Laboratories	3"		
Centeral Steam Plant (with Auxiliary Chillers Building)	8" & 6"		
Graduate Hall	6" & 4"	4"	2", 1.5" & 0.75"
School of Nursing	6"	Unknown	2" & 1"
Medical Examiner Building	2"		
Administration Building	4"		
Parking Structure (Along N. Mission Road)	(2)-3"		
Gatehouse (Along N. Mission Road)	2"		
Women's Hospital Patient Financial Service	4"		
Laundry Building	2"		
Publing and Carpentry Building	2"		
Power Plant Building	8"		
Patient Service Building	4"		3" & 1"
Telephone Exchange Building	2"		
Flammable Storage Building		6"	
Outpatient Clinic	8" & 3" (Swimming Pool)	6"	
Parking Structure (corner of Zonal & N. Cummings)	Unknown	Unknown	Unknown
Clinical Research Building	3"		
Women's Hospital	(2)-8"	8"	
Gatehouse (Corner of N. Mission & Zonal)	1.5"		
Intern's residence	8"	6"	
New Hospital Building	N/A	N/A	N/A

This list is based on as-built documentation
"LAC/USC medical Center Utility Systems Record Drawing"
- 1975 by The Ralph M. parsons Company

Project: LAC+USC Medical Campus Master Plans

Existing Offsite Sewer Lines Utility

On N. Mission Road

Location	Size	Slope	Capacity (cfs)
From Zonal Avenue to Sichel Street	8" VCP	0.40%	0.710
From S. of Sichel Street to Workman Streeet	8" VCP	0.40%	0.710
Fron S. of Workman Street to Marengo Street	8" VCP	0.80%	1.004

In between Mission Road and State Street

Location	Size	Slope	Capacity (cfs)
From Zonal Avenue to Marengo Street	12" VCP	0.36%	1.985

On Marengo Street

Location	Size	Slope	Capacity (cfs)
From E. of Mission Road to Lord Street	12" VCP	0.50%	2.339
From W. of State Street to Lord Street	8" VCP	2.70%(+)	1.840-1.851
From Britannia Street to State Street	8" VCP	1.44%	1.347
From Chicago Street to Britannia Street	8" VCP	0.40%	0.710

On Cummings Street

Location	Size	Slope	Capacity (cfs)
From S. of Charlotte Street to Marengo Street (Vacate Portion)	6" VCP	21.60%-4.40%	1.093-2.422
From N. of Charlotte Street to Zonal Avenue	6" VCP	2.00%-6.60%	0.737-2.151

On Zonal Avenue

Location	Size	Slope	Capacity (cfs)
From Cummings Street to Biggy Street	8" VCP	9.80%-2.56%	2.519-3.513
From Biggy Street to N. Mission Road	8"-12"-24" VCP	4.36%-0.16%	4.209-11.503
From Biggy Street to State Street	6" RCP	3.52%	0.978
From State Street to E. of N. Mission Road	8" VCP	2.24%-5.92%	1.679-2.730

VCP: Vitrified Clay Pipe
RCP: Reinforced Concrete Pipe

Project: LAC+USC Medical Campus Master Plans

Existing Onsite Sewer lines Utility

BUILDING NAME	Sewer Drain To
Original Hospital Building	Zonal Avenue
Parking Structure (Corner of Marengo and N. Chicago)	N/A
Psychiatric Hospital	Marengo Street
Pediatric Pavilion	Marengo Street (2 connections)
General Laboratories	Marengo Street
Centeral Steam Plant (with Auxiliary Chillers Building)	Marengo Street
Graduate Hall	Marengo Street
School of Nursing	Zonal Avenue
Medical Examiner Building	Marengo Street
Administration Building	N. Mission Road
Parking Structure (Along N. Mission Road)	N/A
Gatehouse (Along N. Mission Road)	N. Mission Road
Women's Hospital Patient Financial Service	Marengo Street
Laundry Building	Marengo Street
Publing and Carpentry Building	Marengo Street
Power Plant Building	Marengo Street
Patient Service Building	Zonal Avenue
Telephone Exchange Building	N/A
Flammable Storage Building	Zonal Avenue
Outpatient Clinic	Zonal Avenue
Parking Structure (corner of Zonal & N. Cummings)	N/A
Clinical Research Building	Marengo Street
Women's Hospital	Zonal Avenue
Gatehouse (Corner of N. Mission & Zonal)	Zonal Avenue
Intern's residence	Zonal Avenue
New Hospital Building	

Project: LAC+USC Medical Campus Master Plans

Existing Offsite Storm draine Lines Utility

ID OF STORM DRAIN	OWNER	SIZE	TYPE	SLOPE	Location
D-5999	LAFCD	4'-0" x 4'-6"	Reinforced Concrete Box	0.252% -22.5%	See Plan
D-22640	LAFCD	36"	Reinforced Concrete Pipe	1.06%-6.70%	See Plan
26567	City of Los Angeles	7'-0" (B) x 3'-6" (H)	Brick Arch	0.31%	See Plan
26959	City of Los Angeles	14"	Vitrified Pipe	Unknown	See Plan

LAFCD: Los Angeles Flood Control District

APPENDIX I – HAZARDS GRAPHICS

City *of* Los Angeles

Hazard Mitigation Plan

REVISED
January 2011

ADOPTED
July 2011

These assets are included on Figure M-1 along with the Dam Inundation area. The replacement values of critical response facilities and their contents that fall in the hazard areas are in the following section, “Estimating Potential Losses”.

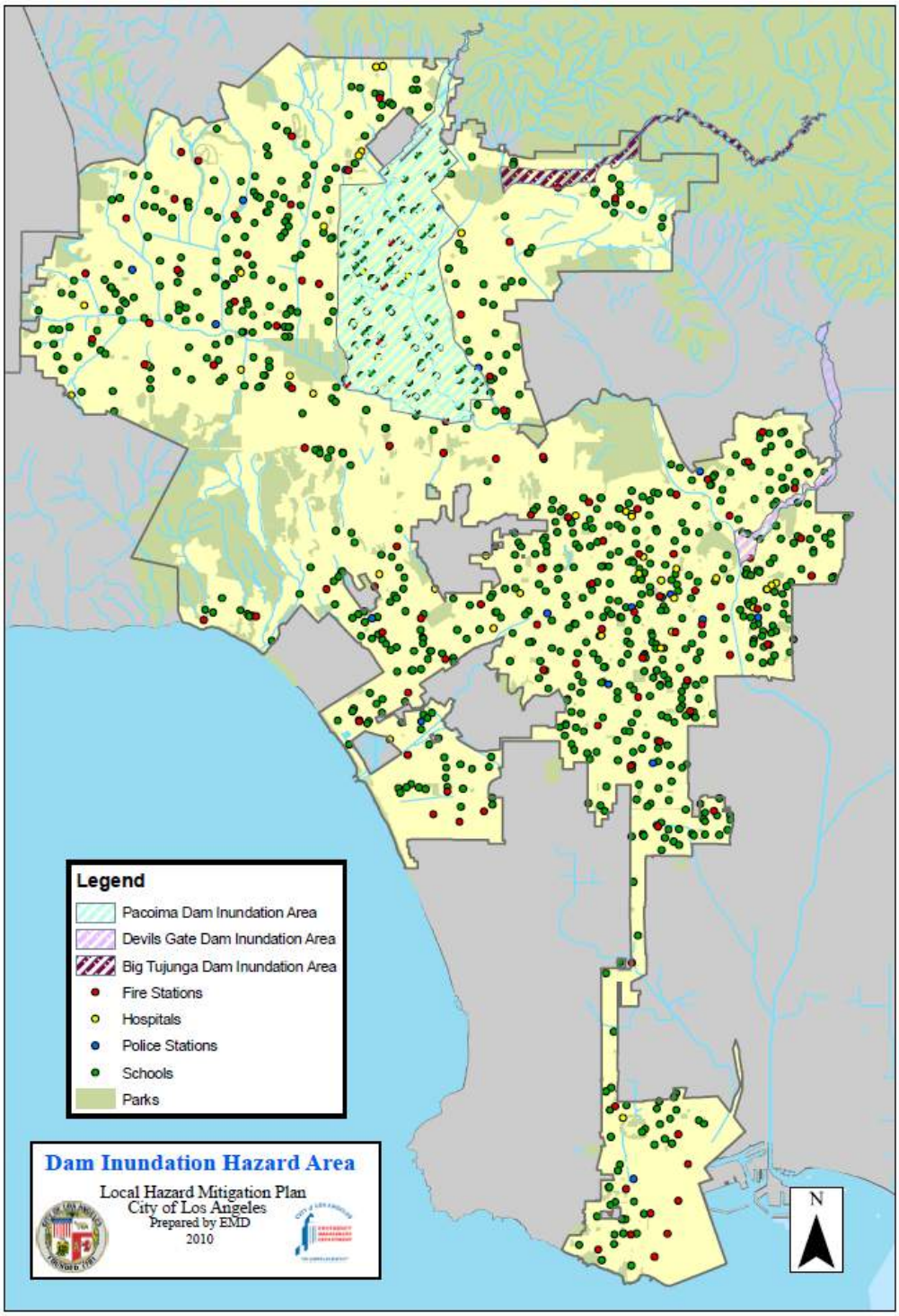


Figure M-1. Critical Response Facilities identified in the Dam Inundation Hazard area.

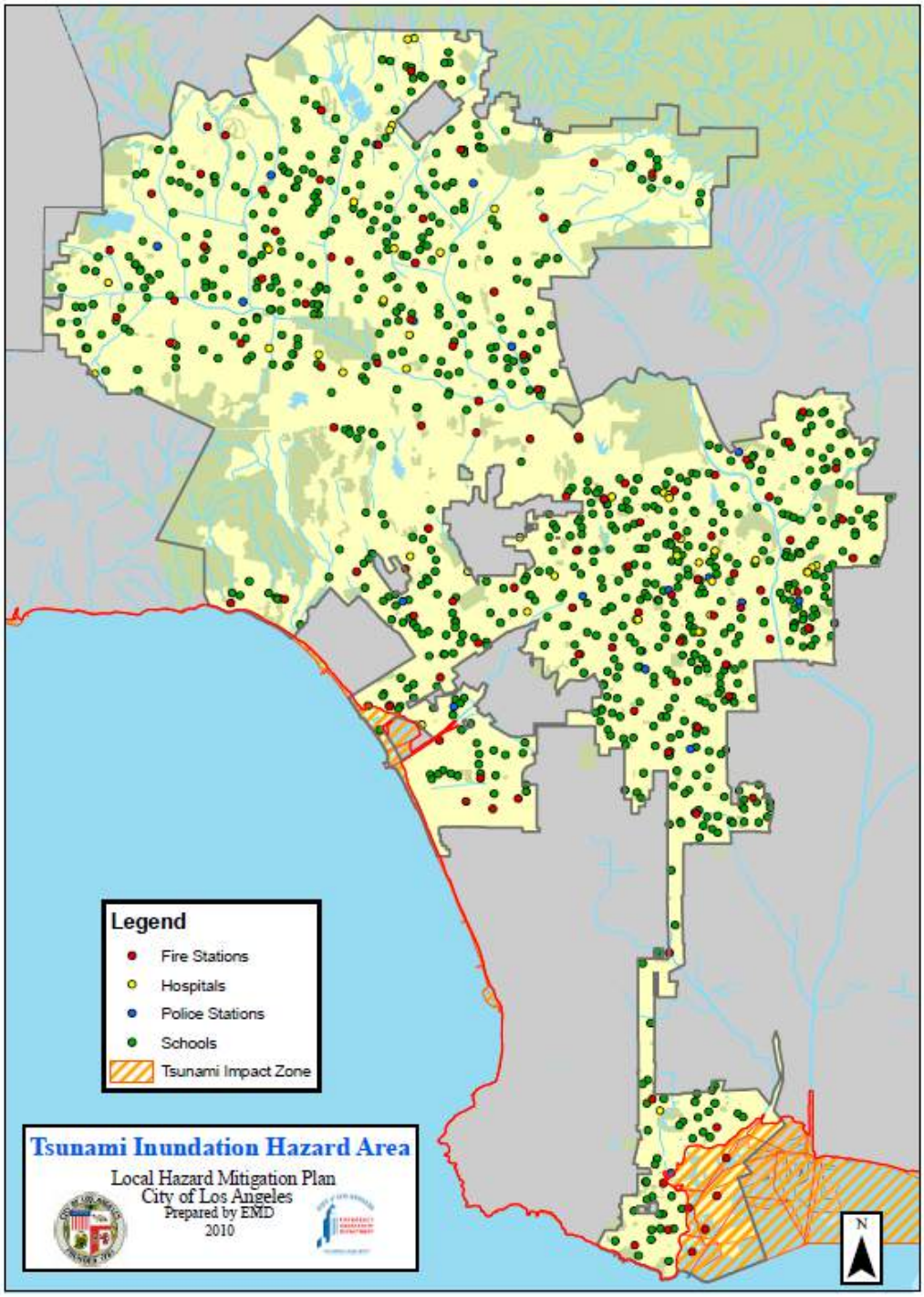


Figure O-1. Critical Response Facilities identified in the Tsunami Inundation Hazard area. Tsunami inundation data provided by the USGS.

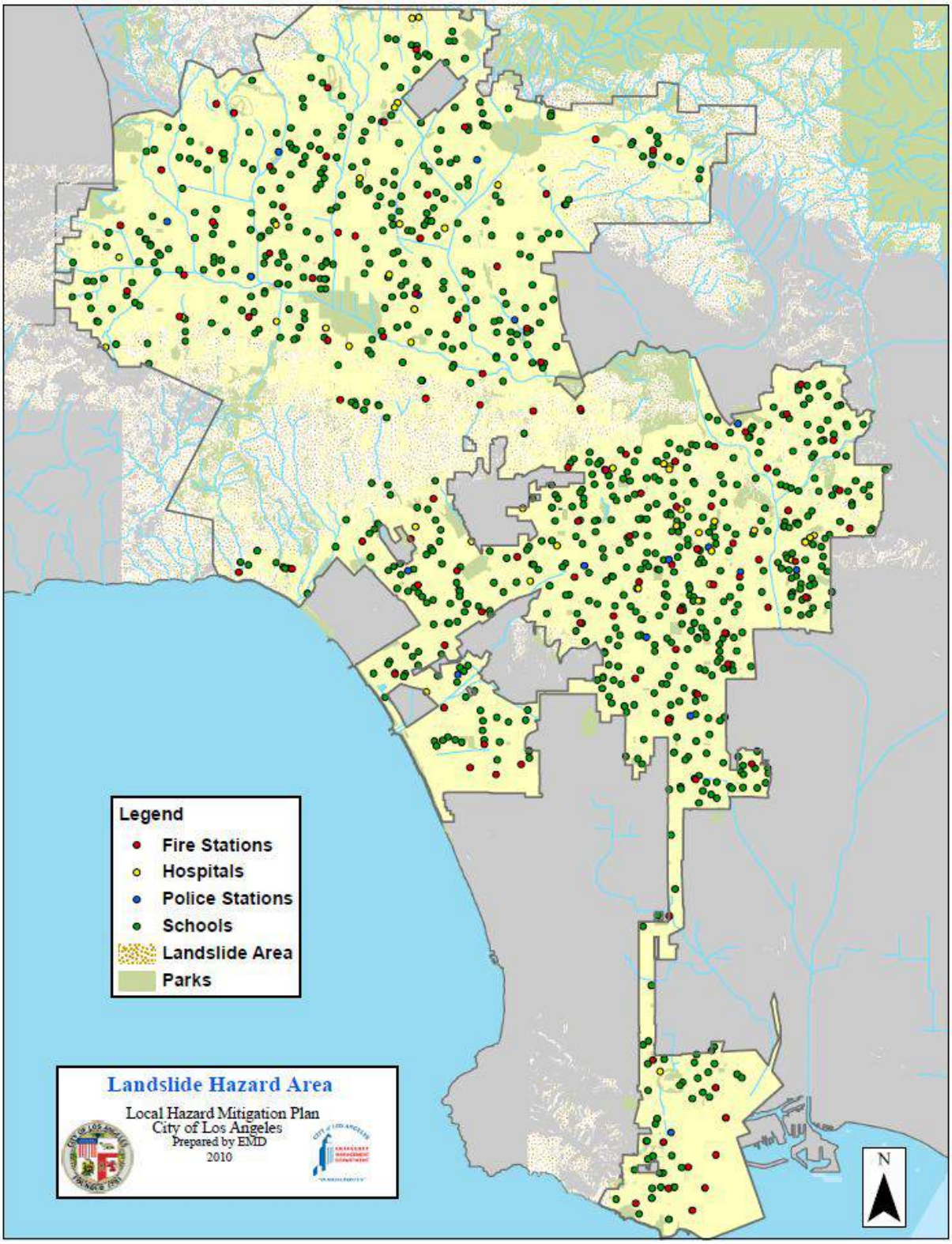


Figure P-1. Critical Response Facilities identified in the Landslide Hazard Area in the City of Los Angeles.

APPENDIX J – EXAMPLE O&M FACT SHEETS FOR LID FEATURES ANTICIPATED AT SITE

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O&M FACT SHEET 1: PERMEABLE PAVEMENT

What To Look For	What To Do as Required
Structural Components, including surface materials, shall evenly infiltrate storm water.	
➢ Clogged surface/Ponded Water	➢ Vacuum sweep at least twice a year. ➢ Powerwash annually or as needed. Do not use surfactants. ➢ Record instances of excessive ponding on maintenance logs.
➢ Cracked or moving edge restraints	➢ Repair per manufacturer's specifications.
➢ Cracked or settled pavement	➢ Repair per manufacturer's specifications.
➢ Resurfacing	➢ Do not replace or cover with impermeable surface.
➢ Materials Storage	➢ Do not store loose materials, sand, bark, mulch, etc. on pavement.
Vegetation, including vegetation growing within Permeable Pavement system or with adjacent roots.	
➢ Large shrubs or trees	➢ Sweep leaf litter, debris, and sediment to prevent surface clogging and ponding. ➢ Prevent large root systems from damaging subsurface structural components.
➢ Weeds	➢ Manually remove weeds. Do not use herbicides.

Maintenance Schedule:
Summer. Make necessary structural repairs.
Fall. Vacuum sweep.
Winter. Monitor infiltration rate with visual observation.
Spring. Powerwash, with proper disposal. Vacuum sweep.
All seasons. Weed as necessary. Remove trash and debris. Sweep or rake leaf litter and sediment.

Maintenance Records:
Inspect and maintain facilities to ensure proper function and aesthetic appearance. Record date, description, and contractor or staff for all structural repairs and facility clean-out activities in maintenance logs (Appendix C).

Replacement and Reconstruction:
Provide adaptive management to determine reconstruction or replacement of the facilities. Use adaptive management to restore original or revised design and function or hydrologic equivalent.

Infiltration/Flow Control: All facilities shall drain within three days (72 hours) after introduction, especially during the peak mosquito breeding months of April through October. Record time, date, and weather conditions when excessive ponding occurs.

Pollution Prevention: Implement Best Management Practices (BMPs) to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall be in compliance with the local jurisdictions so as to not cause a public nuisance or undermine the facility structure. Note holes/burrows in and around facilities. Comply with the September, 2011 or current edition of the Riverside County Flood Control and Water Conservation District *Low Impact Development Best Management Practice Design Handbook* criteria regarding vector control.

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O&M FACT SHEET 2: INFILTRATION TRENCHES

What To Look For	What To Do as Required
Structural Components, including curb cut inlets, depressed sediment basins, and surface materials, shall evenly infiltrate stormwater.	
➢ Clogged inlets or depressed sediment basins at curb cut inlets	➢ Clean gutters, curb cut inlets, and depressed sediment basins twice a year.
➢ Cracked curb cuts or inlets	➢ Repair/seal cracks. Replace when repair is insufficient.
Vegetation, including vegetation growing within Infiltration Trenches or with adjacent roots.	
➢ Large Shrubs and Trees	➢ Prevent large root systems from damaging subsurface structural components.
Filter Layer, including pea gravel and rock/gravel bed.	
➢ Ponding water	➢ Remove sediment and debris from all accessible components. ➢ Clogging and excessive ponding may require decommissioning and replacement.

Maintenance Schedule:
Summer: Make necessary structural repairs. Clean depressed sediment basins at curb cut inlet into infiltration trenches.
Fall: Clean curb cut inlets, gutters, and depressed sediment basins.
Winter. Monitor infiltration rate with visual observation.
Spring: Clean curb cut inlets, gutters, and depressed sediment basins.
All seasons. Weed as necessary. Remove trash and debris. Sweep or rake leaf litter and sediment.

Maintenance Records:
Inspect and maintain facilities to ensure proper function and aesthetic appearance. Record date, description, and contractor or staff for all structural repairs and facility clean-out activities in maintenance logs (Appendix C).

Replacement and Reconstruction:
Provide adaptive management to determine reconstruction or replacement of the facilities. Use adaptive management to restore original or revised design and function or hydrologic equivalent.

Infiltration/Flow Control: All facilities shall drain within three days (72 hours) after introduction, especially during the peak mosquito breeding months of April through October. Record time, date, and weather conditions when excessive ponding occurs.

Pollution Prevention: Implement Best Management Practices (BMPs) to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall be in compliance with the local jurisdictions so as to not cause a public nuisance or undermine the facility structure. Note holes/burrows in and around facilities. Comply with the September, 2011 or current edition of the Riverside County Flood Control and Water Conservation District *Low Impact Development Best Management Practice Design Handbook* criteria regarding vector control.

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O&M FACT SHEET 3: BIORETENTION, RAIN GARDENS, AND BIOSWALES

What To Look For	What To Do as Required
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
➢ Clogged inlets or outlets	➢ Remove sediment and debris from catch basins, trench drains, curb inlets, and pipes to maintain at least 50% conveyance capacity at all times.
➢ Cracked drain pipes or grates	➢ Repair/seal cracks. Replace when repair is insufficient.
➢ Check dams	➢ Maintain as designed (if present).
Vegetation shall cover a minimum of 75% of the facility for Rain Gardens.	
➢ Dead or strained vegetation	➢ Manually remove sediment accumulation. ➢ Replant per original planting plan. Maintain minimum 75% vegetative cover.
➢ Grasses and vegetation	➢ Irrigate as needed. ➢ Remove and replace mulch annually (shredded hardwood mulch preferred)[1]. DO NOT apply fertilizers, herbicides, or pesticides [2]. ➢ Cut back grass 1-2 times each year if desired to remove seed heads in mid- and late spring. Do not cut more than 1/3 of height during single mowing. Use weed eater or string trimmer. ➢ Prune other vegetation overgrowth. ➢ Prune to allow sight lines and foot traffic.
➢ Weeds	➢ Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours of introduction of runoff, without isolated ponding areas or pockets of ponding.	
➢ Gullies	➢ Fill, lightly compact, and install plant vegetation to disperse flow.
➢ Erosion	➢ Repair inlet gravel/rock or other erosion control elements.
➢ Slopes	➢ Stabilize 3:1 (i.e., maximum slope of 33%) slopes/banks with plantings from original planting plan.
➢ Ponding	➢ Remove accumulated sediment. ➢ Rake, till or amend to restore infiltration rate[1]. ➢ Inspect annually upstream facilities and/or land use that may contribute to sediment loading issues. ➢ Use compost and mulch without animal products to avoid leaching of nutrients in stormwater facilities.

[1]Use compost and mulch without animal manure to avoid leaching of contaminants in stormwater facilities.
[2]The use of fertilizers, herbicides, or pesticides shall be approved by City as these are water quality facilities and stormwater runoff typically contains nutrients. At a minimum, follow Integrated Pest Management (IPM) practices. See U.S. Environmental Protection Agency (EPA) website at www.epa.gov/opp00001/factsheets/ipm.htm for details, the River Friendly Landscaping Program at http://www.msa.saccounty.net/sactostormwater/RFL/, and the University of California Statewide Integrated Pest Management Program at www.ipm.ucdavis.edu/ for additional general information on IPM.

Note: Refer to Landscape Specifications for project for additional details on plant lists and species-specific maintenance.

See Landscape-Based LID Maintenance Schedule and Inspection Guidelines on page six of this O&M Plan for additional details.

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LANDSCAPE-BASED LID MAINTENANCE SCHEDULE AND INSPECTION GUIDELINES

The following apply to Bioretention:

Maintenance Records:
Inspect and maintain facilities to ensure proper function and aesthetic appearance. Record date, description, and contractor or staff for all structural repairs and facility clean-out activities in maintenance logs (Appendix B).

Replacement and Reconstruction:
Provide adaptive management to determine reconstruction or replacement of the facilities. Use adaptive management to restore original or revised design and function or hydrologic equivalent. See Table 1 for projected life-cycle of system. The City's Civil Engineer will determine the need for reconstruction or replacement of the facilities.

Infiltration/Flow Control: All facilities shall drain within three days (72 hours) after introduction, especially during the peak mosquito breeding months of April through October. Record time, date, and weather conditions when excessive ponding occurs. Use practices specified under Growing/Filter Medium maintenance to restore capacity, if needed.

Pollution Prevention: Implement Best Management Practices (BMPs) to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. See Appendix D for the City's materials management guidelines. Use compost and mulch without animal manure to avoid leaching of contaminants in stormwater facilities, where feasible.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall be in compliance with the local jurisdictions so as to not cause a public nuisance or undermine the facility structure. Note holes/burrows in and around facilities. Comply with the November, 2013 or current edition of the Sacramento Region *Stormwater Quality Design Manual* criteria regarding vector control.

Access: Maintain ingress/Egress, including access roads, to design standards.

Maintenance Schedule as Required:
Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.
Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance. Prune/mulch as needed.
Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Remove and replace mulch to maintain/restore pre-treatment capacity for sediment and metals removal. Cut back Biofiltration Sod in Bioswales (Vegetated Swales) and grasses in Rain Gardens to remove seed heads, if desired.
All seasons. Weed as necessary. Remove litter and debris.

O&M FACT SHEET 4: CUDO STORMWATER CUBE SYSTEM[1] (SUBSURFACE INFILTRATION BENEATH PERMEABLE PAVEMENT)

What To Look For	What To Do
Inspection, including structural components and storage capacity (see Appendix B for additional details).	
➢ Ponded Water	➢ Note ponded water in excess of 72 hours (see Infiltration/Flow Control and Vectors guidelines below for additional guidelines and details on emergency overflow valve)
➢ Structural Components	➢ Inspect inlets and outlets for obstructions[3]. ➢ Inspect structural components.
➢ Storage Capacity	➢ Insert measuring device into inspection and cleanout ports[2] to remotely measure quantity of sediment. Do not enter system without appropriate equipment and certified personnel.[3] Removal required when sediment and other materials reach a depth of two inches.
Maintenance, including sediment and floatables removal and sediment disposal (see Appendix B for details).	
➢ Sediment Removal	➢ Remove obstructions, trash, and debris from inlets and outlets. ➢ Use vacuum truck or manual methods to thoroughly remove sediment from the s system, including: inlets, outlets, ports, and inlet bays.
➢ Sediment Disposal	➢ Use DOT approved containers for disposal. Dispose of floatables (gross pollutants) and sediment as EPA Class 2 hazardous waste.

[1]See Appendix B for manufacturer's recommendations for O&M activities and inspection procedures summarized in this Fact Sheet.
[2]Document location of inspection ports, access, and clean-out locations in photographs during first inspection and maintain with maintenance records for future reference.
[3]Personnel must have OSHA confined space training and be CalOSHA certified to enter system.

Maintenance Schedule:
Summer. Same as fall and spring if significant dry weather flows enter system or excessive sedimentation noted.
Fall. Inspect system just prior to rainy season. Remove sediment, trash, and debris if needed.
Winter. Remove sediment, trash, and debris if needed.
Spring. Inspect system immediately following rainy season. Remove sediment, trash, and debris if needed.
All seasons. Open valve in emergency overflow line to drain Cudo system if required for vector control issues.

Maintenance Records:
Inspect and maintain facilities to ensure proper function. Record date, description, and contractor for all structural repairs and facility clean-out activities. Include photographs of sediment level noted during inspection, if visible. During first inspection, photograph location of access ports and clean-outs and maintain in records for reference.

Replacement and Reconstruction:
Provide adaptive management to determine reconstruction or replacement of the facilities. Use adaptive management to restore original or revised design and function or hydrologic equivalent. The City's Civil Engineer will determine the need for reconstruction or replacement of the facilities.

Infiltration/Flow Control: All facilities shall drain within three days (72 hours) after introduction, especially during the peak mosquito breeding months of April through October. Drain-down times up to 14 days or longer for larger rainfall events may be acceptable during the months of September through March. Record time, date, and weather conditions when excessive drain-down occurs.

Pollution Prevention: Implement Best Management Practices (BMPs) to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. See Appendix E for City's materials management guidelines.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall be in compliance with the local jurisdictions so as to not cause a public nuisance or undermine the facility structure. Note holes/burrows in and around facilities. Seal openings in stormwater manholes, access and inspection ports, and clean-outs with mosquito-proof materials. Comply with *Sacramento County Low Impact Development Criteria Manual* criteria regarding vector control. Manual is anticipated for release in 2012.

At the discretion of the City's Stormwater Manager, the valve in the emergency overflow line may be opened to drain the Cudo system and eliminate standing water below ground, if requested by vector control or needed to eliminate mosquito-breeding. The valve is located in the southwestern portion of the site near the edge of the Permeable Pavement.

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O&M FACT SHEET 5: RAIN BARREL

What To Look For	What To Do
Inlet, Outlet, and Overflow shall be tight-fitting and free-draining.	
➢ Inlet, Downspout, and Leaf Screens	➢ Remove leaf, debris, and organic litter from screens.
➢ Outlet	➢ Confirm outlet is accessible and shuts on/off.
➢ Overflow	➢ Ensure overflow is free-draining away from building and into Vegetated Filter Strip. Remove clogs manually.
Rain Barrel shall be maintained to remain free of trash, debris, and sediment with tight-fitting fixtures.	
➢ Screen/LID	➢ Remove leaf, debris, and organic litter from screens. ➢ Confirm lid and screen is tight-fitting and fully closed.
➢ Rain Barrel	➢ Check for and remove debris/trash from inside rain barrel. ➢ Check for sediment build-up. Remove sediment and dispose of with landscape waste/debris. Do not rinse into LID facilities. ➢ Use collected rainwater for landscape irrigation. ➢ Replace Non-Potable Sign as needed with English and Spanish wording similar to: "***Do not drink. Water is non-potable.***" and ***"No Beber – Agua No Potable."***

Maintenance Schedule:
Summer. Remove sediment build-up. Do not dispose of or rinse into LID facilities.
Fall. Confirm function of inlet, outlet, and overflow. Use harvested rainwater for landscape irrigation.
Winter. Confirm function of inlet, outlet, and overflow. Use harvested rainwater for landscape irrigation.
Spring. Confirm function of inlet, outlet, and overflow. Use harvested rainwater for landscape irrigation.
All seasons. Remove trash and debris. Remove leaf, debris, and organic litter from screens. .

Maintenance Records:
Inspect and maintain facilities to ensure proper function and aesthetic appearance. Record date, description, and contractor or staff for all structural repairs and facility clean-out activities in maintenance logs (Appendix D).

APPENDIX K – PROPOSED STORMWATER FEATURES PLAN FROM MASTER PLAN

WATER DETENTION AREA

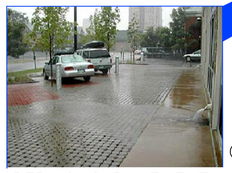
Q_{25}=42.8 CFS, T_C=5 MIN
Q_{50}=48.48 CFS, T_C=5 MIN
Q_{100}=54.08 CFS, T_C=5 MIN
Q_{SUSMP}=2.20 CFS, T_C=22 MIN

Q_{25}=21.53 CFS, T_C=7 MIN
Q_{50}=24.35 CFS, T_C=7 MIN
Q_{100}=29.13 CFS, T_C=6 MIN
Q_{SUSMP}=1.47 CFS, T_C=28 MIN

Q_{25}=27.53 CFS, T_C=5 MIN
Q_{50}=31.12 CFS, T_C=5 MIN
Q_{100}=24.71 CFS, T_C=5 MIN
Q_{SUSMP}=1.83 CFS, T_C=21 MIN

BIOSWALE/RAINGARDENS

Q_{25}=8.91 CFS, T_C=7 MIN
Q_{50}=10.82 CFS, T_C=6 MIN
Q_{100}=12.05 CFS, T_C=6 MIN
Q_{SUSMP}=0.63 CFS, T_C=26 MIN



PERVIOUS PAVEMENT

Q_{25}=31.01 CFS, T_C=5 MIN
Q_{50}=35.05 CFS, T_C=5 MIN
Q_{100}=39.10 CFS, T_C=5 MIN
Q_{SUSMP}=1.69 CFS, T_C=23 MIN

Q_{25}=20.34 CFS, T_C=10 MIN
Q_{50}=24.09 CFS, T_C=9 MIN
Q_{100}=26.89 CFS, T_C=9 MIN
Q_{SUSMP}=1.59 CFS, T_C=30 MIN

Q_{25}=24.51 CFS, T_C=6 MIN
Q_{50}=27.66 CFS, T_C=6 MIN
Q_{100}=33.62 CFS, T_C=5 MIN
Q_{SUSMP}=1.70 CFS, T_C=23 MIN

Q_{25}=10.14 CFS, T_C=5 MIN
Q_{50}=11.47 CFS, T_C=5 MIN
Q_{100}=12.79 CFS, T_C=5 MIN
Q_{SUSMP}=0.79 CFS, T_C=15 MIN

LAC+USC MEDICAL CAMPUS
PROPOSED STORMWATER CONVEYANCE CONCEPT PLANS

LOS ANGELES, CALIFORNIA

LEGEND:

- RIGHT-OF-WAY LINE
- CENTER LINE
- EXISTING OFF-SITE STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING BUILDING TO REMAIN
- PROPOSED BUILDING
- WETLAND/DETENTION AREA
- PERVIOUS PAVEMENT
- BIOSWALE AREA
- SUB-AREA LINE
- LONGEST FLOW PATH
- FLOW PATH ANNOTATION
- HYDROLOGY SUB-AREA NUMBER AND ACREAGE
- HYDROLOGY AREA CONFLUENCE POINT
- DIRECTIONAL FLOW ARROW

GRAPHIC SCALE IN FEET
0 40 80 160

Kimley-Horn and Associates, Inc.

Engineering, Planning, and Environmental Consultants
765 The City Drive, Suite 200
Orange, California 92868 (714) 939-1030

MEMORANDUM OF HYDROLOGY MODELING RESULTS

Project: **LAC+USC Medical Center EIR**

Client: ICF International/Los Angeles County

Prepared By: Jennifer J. Walker, P.E., D.WRE, CFM, QSD

Date: 7/15/2014

Purpose: Memorandum of Hydrology Modeling Results

Note: Draft memorandum released under the authority of Jennifer J. Walker, P.E. (C77079), D.WRE, CFM on 7/15/2014 and should not be used for design or construction.

This memorandum documents hydrologic and Low Impact Development (LID) modeling results for ultimate build-out of the LAC+USC Medical Center project as described in the October, 2013 *LAC+USC Master Plan*. The project is anticipated to include post-construction stormwater Best Management Practices (BMPs) and Low Impact Development (LID) features. Because a detailed plan has not been developed hydrologic and LID analyses are based on the general concept and layout described in the *Master Plan* rather than a detailed, fixed plan.

As shown on Exhibit 1 (Appendix A), the project site is located just north of Interstate Highway (IH) 10 and just east of IH-5. The site is bounded by Cornwell to the east, Zonal to the north, Marengo to the south, and North Mission to the west. Three additional tracts are located at northeast, northwest, and southwest corners of the intersection of Zonal and North Mission.

The project site is currently fully developed and land cover consists primarily of buildings and pavement with an existing impervious cover of 95% (Exhibit 2 in Appendix A). While limited, vegetation on the site includes trees, shrubs, and turf grass scattered within the project site and dense plantings of trees and groundcovers within the northeastern portion of the site ("the hill").

The Proposed Stormwater Conveyance Concept Plan from the *Master Plan* (Appendix A1) illustrates the location of the following LID features at the site:

- Bioretention
- Permeable Pavement
- Wetlands/Detention

While the *Master Plan* indicates that stormwater harvesting and reuse may be included and that a green roof will be installed for agricultural and urban farming purposes, these LID features are not included in the modeling for the project as they are not specifically programmed at this time.

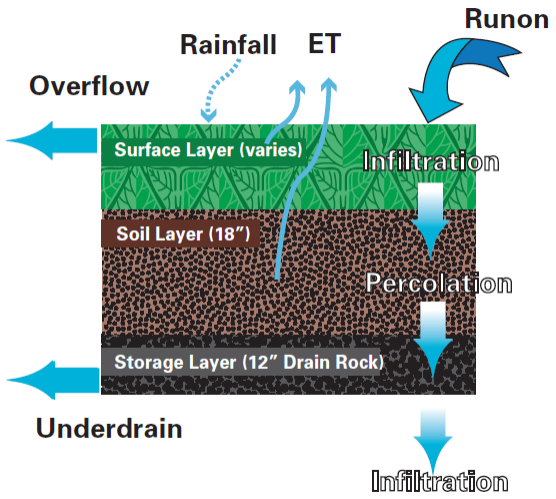
The goals established for this project include:

- ✓ Meet Los Angeles County LID and stormwater treatment criteria
- ✓ Reduce proposed LID conditions peak flows and runoff volumes to below existing conditions
- ✓ Shift the water budget and site hydrology towards undeveloped conditions with improved infiltration and groundwater recharge as compared to existing conditions

Modeling/Hydrologic Methodology

The U.S. Environmental Protection Agency's (EPA)'s Storm Water Management Model (SWMM) 5.0.022 was utilized for the LID design storm and continuous simulation modeling in this project. The current version of SWMM includes LID controls and detailed analysis options not previously included in SWMM5. The SWMM model is also a publicly-available model. The SWMM model accounts for infiltration through various LID layers, evapotranspiration, infiltration into the native soil, and overflows and discharge from the LID facilities as illustrated in Figure 1. Note that the underdrain and drain rock layer are used only in Permeable Pavement and Bioretention for this project.

Figure 1: LID Components and Processes Modeled in SWMM



Recent studies by the EPA cited in the report entitled *SUSTAIN – A Framework for Placement of Best Management Practices in Urban Watersheds to Protect Water Quality* found similar results for analysis of aggregated (lumped) LID controls in drainage sub-areas of 100 ac or more as compared to micro-drainage sub-areas for each lot and LID control (distributed approach). For a 128-acre drainage sub-area, the difference in peak flows between the aggregated and distributed approaches computed in the EPA study is four-percent. Similar positive findings with regards to the aggregated approach were also reported by the City of Portland's Bureau of Environmental Services in a paper entitled *Modeling Non-Directly Connected Impervious Areas in Dense Neighborhoods.*

Since the area of the LAC+USC Medical Center EIR site is approximately 84 ac and well under the threshold for using the aggregated method, the aggregated modeling approach was used for this project to increase modeling efficiencies. Peak flow rates are expected to be within one-percent of those computed using the distributed approach and volumes are expected to be within approximately three-percent.

Table 1 in Appendix B lists hydrologic parameters associated with the site. Proposed conditions parameters are based on the LID layout included in the Proposed Stormwater Conveyance Concept Plan from the *Master Plan* (Appendix A1). Existing and undeveloped conditions parameters are estimated and may not precisely reflect conditions as soils, topographic, and other detailed data is not available.

The Direct Determination Runoff method is used to estimate runoff and generate hydrographs from the site within the SWMM model. As described below, the design storm rainfall data is obtained from National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6. Rainfall hyetographs are developed using the U.S. Army Corps of Engineers (USACE) HEC-HMS (Hydrologic Engineering Center-Hydrologic Modeling System) software program, which is publicly available.

The Green & Ampt method, which is based on physically-measurable soil parameters and has been used successfully on other LID projects in the region, is used to estimate losses due to infiltration. Based on Exhibit 7 in Appendix A, native underlying soils at the sites are assumed to be a mix of clay loam and loam with saturated hydraulic conductivity rates of approximately 0.085 inches/hour. The suction head and initial deficit parameters shown in Table 2 are estimated for a mix of clay loam and loam from standard soils texture tables.

Table 3 provides details on the area draining to each LID feature at the site based on the Proposed Stormwater Conveyance Concept Plan from the *Master Plan* (Appendix A1). Table 4 includes details on the configuration modeled for each type of LID feature at the site. As indicated in these tables, the project site includes the following LID features:

- Permeable Pavement
- Bioretention
- Wetlands/Detention

To facilitate planning-level modeling, the Wetlands/Detention areas are modeled as bioretention. Additionally, the impervious area treated by each type of LID is assumed based on the LID features and site layout shown in the Proposed Stormwater Conveyance Concept Plan from the *Master Plan* (Appendix A1).

The proposed LID features are also planned to meet requirements in the Los Angeles County *Low Impact Development Standards Manual*. The goal of the LID features is to provide stormwater quality benefits and to more closely mimic undeveloped site hydrology. LID features are required to retain 100-percent of the stormwater quality design volume (SWQDv) on-site through a combination of infiltration, evapotranspiration, and stormwater harvest and use unless it is demonstrated that it is technically infeasible to do so. For this project, the SWQDv is 0.95 in, which is the 85th-percentile, 24-hour event obtained from the Los Angeles County 85th percentile precipitation isoheytal map for the project site location.

Based on the LID features illustrated in the Proposed Stormwater Conveyance Concept Plan from the *Master Plan* (Appendix A1) and assumed configurations documented in Table 4, the proposed LID features seem adequate to meet SWQDv requirements assuming storage within the growing

media and drain rock layers is considered (Table 4A). With these layers, the total provided volume is estimated at 9.26 acre-feet (ac-ft), while the required SWQDv is calculated at 6.62 ac-ft. Without these layers, additional LID features may be needed to meet requirements as a deficit of 2.73 ac-ft is estimated. Additionally, note that retention, harvest and use on-site, or infiltration must be provided for the total SWQDv and the size and configuration of the LID features may need to be modified to meet this requirement. Regardless, the proposed site will be required to meet SWQDv requirements and the LID extent may be increased as needed or stormwater harvesting and use may be incorporated. The project is likely to be exempt from hydromodification management requirements as it is a redevelopment project anticipated to result in less impervious cover than existing conditions.

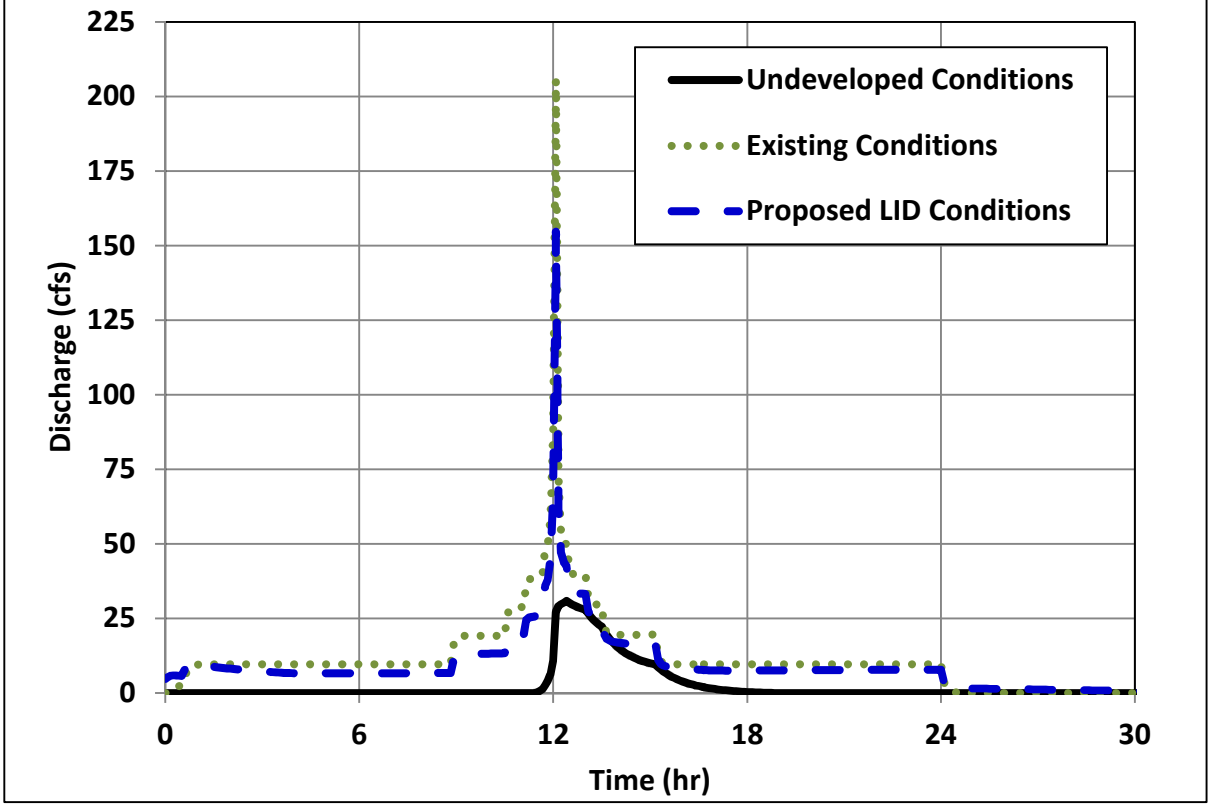
Design Storm Results

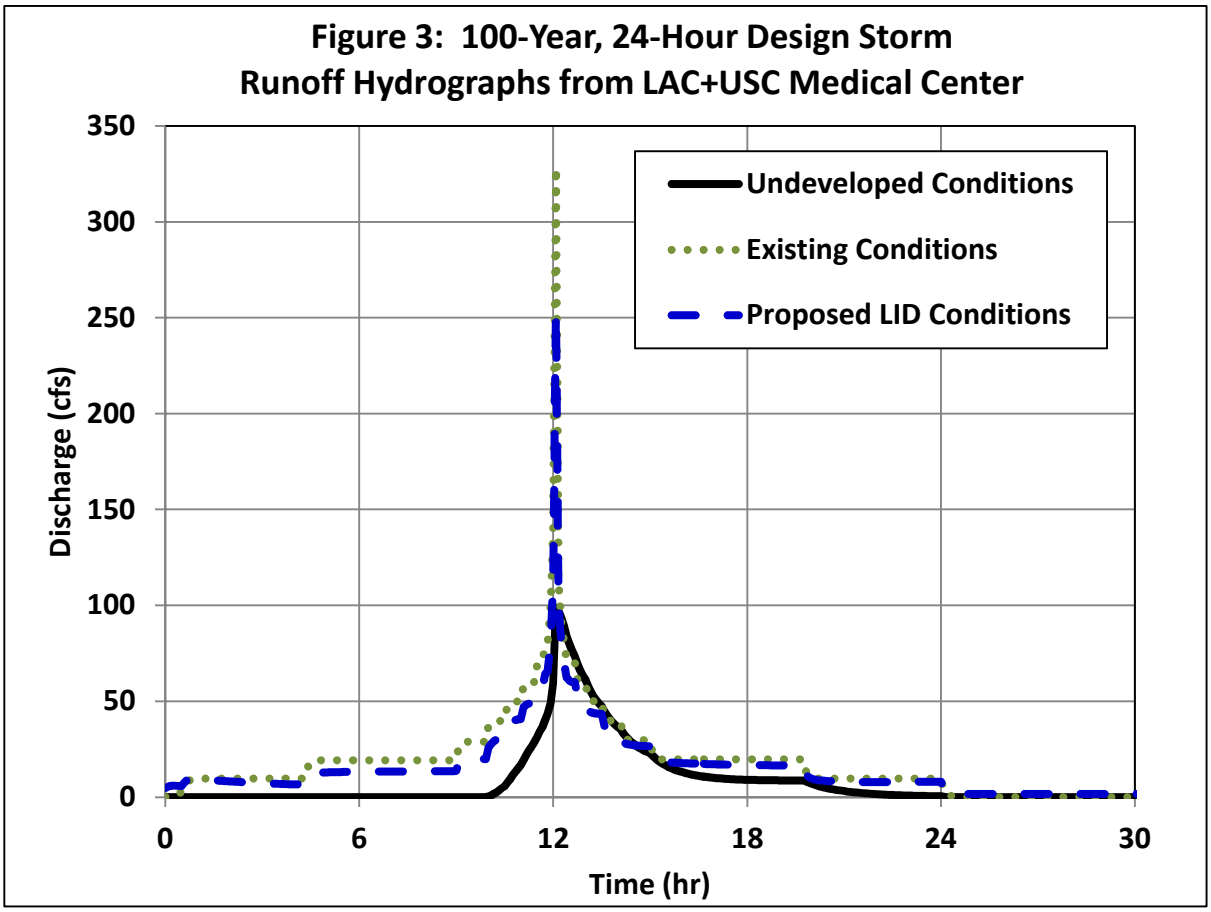
The 100-year, 24-hour and 10-year, 24-hour design storm events are modeled to assess runoff during an extreme flood control event and an event representative of storm drain sizing, respectively. As shown in Table 1, the 10-year, 24-hour and 100-year, 24-hour rainfall depths fare 4.84 and 7.87 inches (in), respectively. As indicated, the design storm rainfall data is obtained from NOAA Atlas 14, Volume 6 for the Ascot Reservoir gauge and rainfall hyetographs are developed using the USACE HEC-HMS software program, which is publicly available. A peak center of 50% is assumed for all design storm events. The rainfall hyetographs are used by SWMM to develop the design storm runoff hydrographs from the LAC+USC site.

As shown in Table 5, proposed conditions peak flows with the planned LID features are 25-percent less than existing flows from the site for the 10-year, 24-hour event and 23-percent less than existing for the 100-year, 24-hour event. Runoff volumes are reduced by 18-percent and 14-percent, respectively, for the 10-year and 100-year events. While the project goals did not include matching undeveloped conditions, it is also listed for comparison purposes. Note that the initial growing media saturation of 50-percent adds volume to the proposed LID conditions that is not included in the other conditions models. Use of different initial growing media saturation values may change resulting reductions.

Figures 2 and 3 depict runoff hydrographs from the site for the 10-year, 24-hour and 100-year, 24-hour design storm events, respectively. As described, both proposed LID conditions peak flows and runoff volumes as illustrated by the area under the hydrograph curves are reduced by approximately 25-percent below existing conditions. Additionally, the shapes of the proposed LID conditions runoff hydrographs generally match the shapes of the undeveloped conditions runoff hydrographs. Note that final modeling of underdrain sizes and retention times may result in additional hydrograph lagging.

Figure 2: 10-Year, 24-Hour Design Storm
Runoff Hydrographs from LAC+USC Medical Center





Figures 4 to 13 illustrate storage depths within the following layers of the LID features at the LAC+USC Medical Center site:

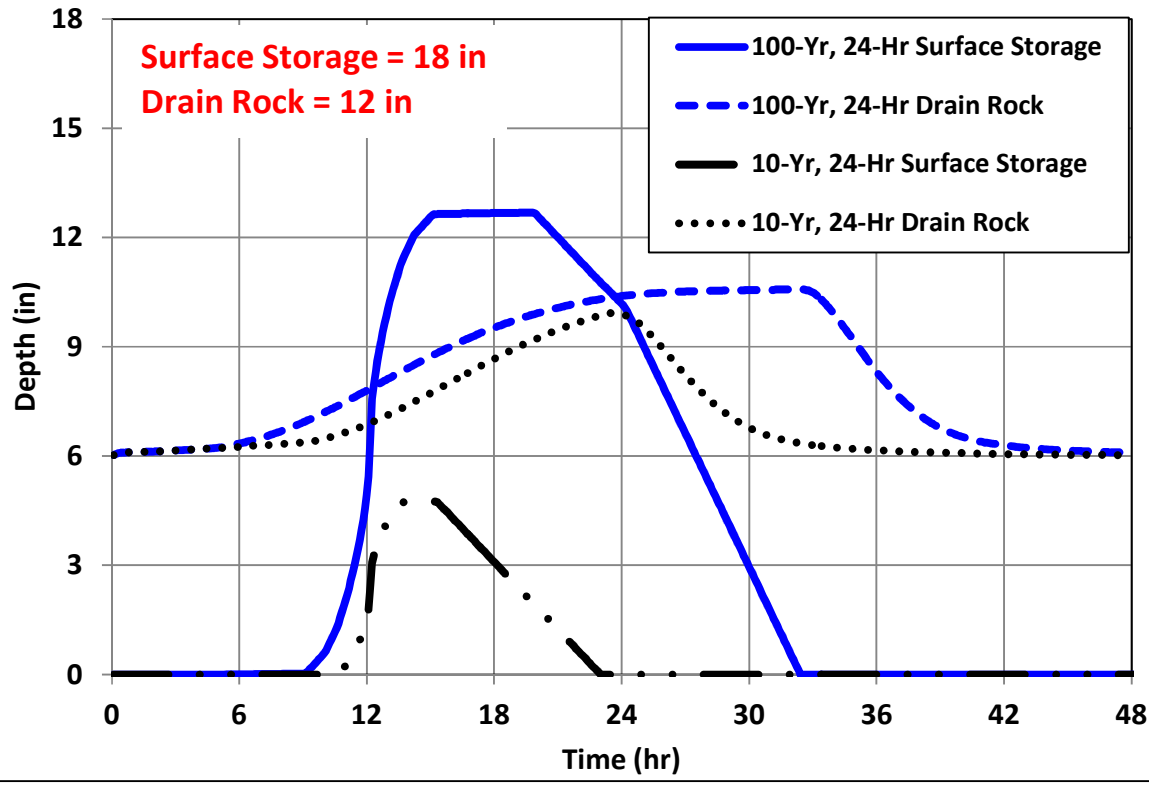
- 18-inch surface storage layer of Bioretention
- 24-inch surface storage layer of Wetlands/Detention
- 12-inch drain rock layer of Bioretention
- 24-inch gravel storage reservoir of Permeable Pavement

Due to hydraulic conductivity rates, underdrains are included in both Bioretention and Permeable Pavement and assumed to be elevated six inches above the bottom of the drain rock layer. Wetlands/detention is assumed not to include an underdrain due to type of LID feature and centralized nature of this stormwater control.

Note that typical assumptions were made regarding the geometric configuration of the LID features (Table 4). Additionally, assumptions on impervious area treated by each type of LID feature are listed in Table 3. During the final design and modeling, it is likely that the hydrologic performance of the various LID features can be improved through changes in geometric configuration and optimization of contributing drainage areas.

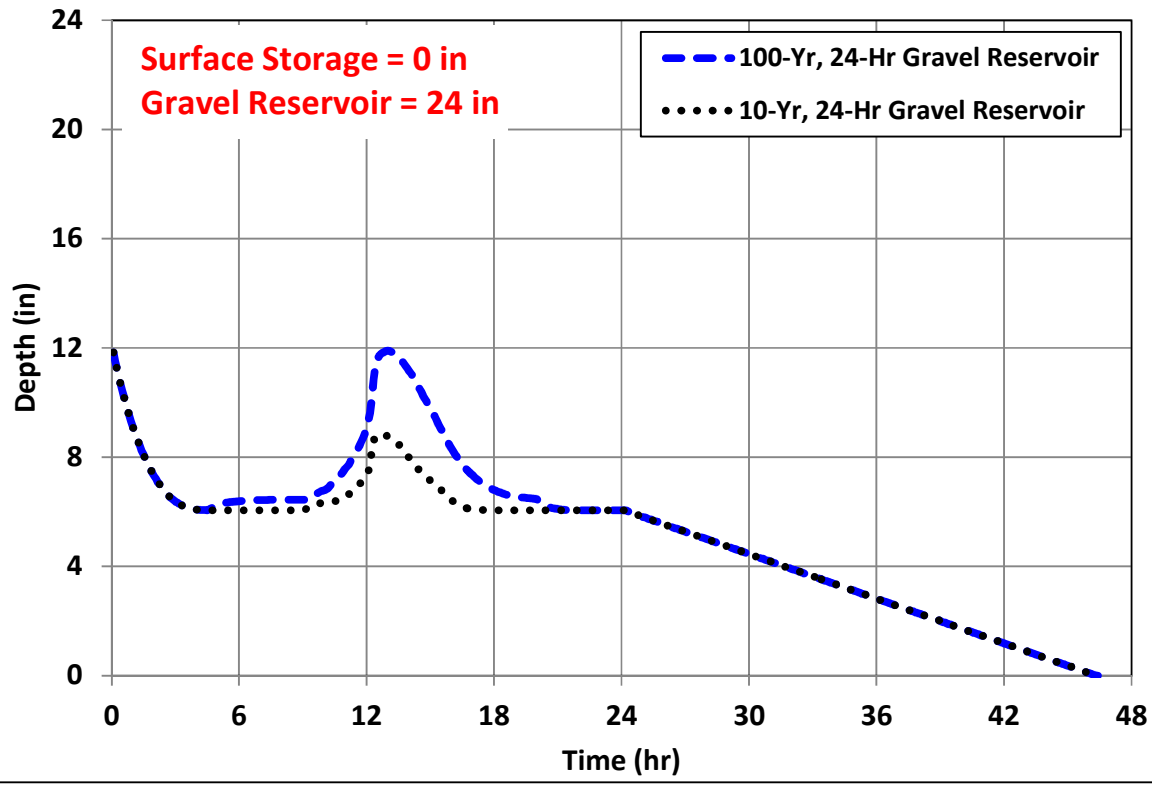
The proposed Bioretention features function as expected and fill to a depth of approximately 13 in in the 100-year, 24-hour event with a drain down time of approximately 32 hours. The maximum level during the 10-year, 24-hour event is approximately 4.8 in with a corresponding drain down time of approximately 24 hours. Initial storage depth in the Bioretention drain rock layer is due to the simulated 50-percent growing media saturation at the beginning of the design storm event. The Bioretention configuration is assumed to include a four-inch perforated underdrain pipe elevated six inches above the bottom of the drain rock layer. Since the Bioretention surface storage does not fill completely, during final design it may be determined to serve additional drainage area or be reduced in depth to less than 18 in.

Figure 4: Design Storm Hydrographs from Bioretention



The drain rock layer of the Permeable Pavement fills to approximately 12 in during the 100-year, 24-hour event and 9 in during the 10-year, 24-hour event. The drain down time fin both events is approximately 48 hours due to the initial saturation of 50%, which causes the initial ponding in the drain rock layer at the beginning of the design storm simulations. The Permeable Pavement LID features are assumed to include a four-inch perforated underdrain pipe elevated six inches below the bottom of the 24-inch gravel storage reservoir. The elevated underdrain enhances infiltration during the historical period of record analyzed in the continuous simulation modeling discussed below. Since the Permeable Pavement drain rock layer does not fill completely, during final design it may be determined to serve additional drainage area or be reduced in depth to less than 24 in.

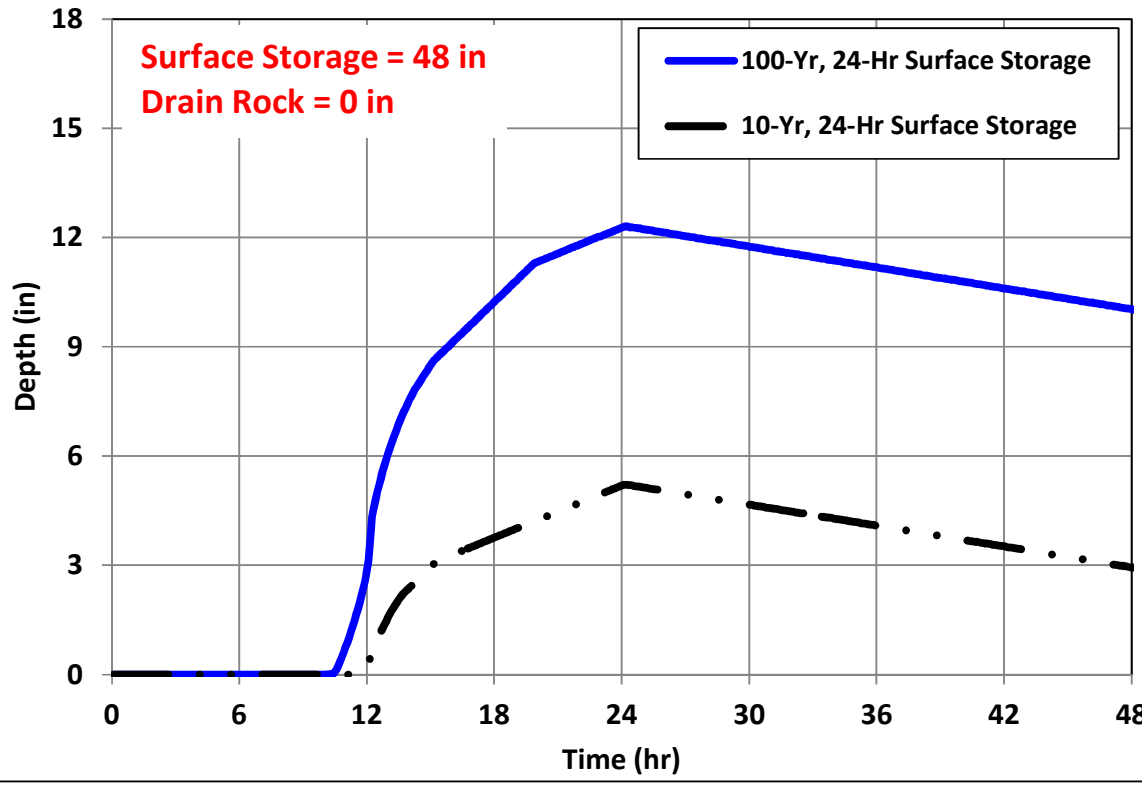
Figure 5: Design Storm Hydrographs from Permeable Pavement



The proposed Wetlands/Detention features fill to a depth of approximately 12 in in the 100-year, 24-hour event with a drain down time in excess of 48 hours. The maximum level during the 10-year, 24-hour event is approximately 5.2 in with a corresponding drain down time of in excess of 48 hours. While the proposed Wetlands/Detention stormwater features was modeled as an LID control using bioretention parameters due to the planning-level nature of this analysis, it may be better represented as a storage reservoir in the final modeling during the design phase as it is a centralized BMP and detention routing may be needed depending on the area served by the Wetlands/Detention.

The Wetlands/Detention configuration is assumed to not require an underdrain as it is a centralized stormwater facility and may be geared towards flood control. The Wetlands/Detention does not fill completely in the modeling performed as part of the LA+USC Medical Center EIR and the actual configuration and dimensions should be refined to meet project goals during the final design phase.

Figure 6: Design Storm Hydrographs from Wetlands/Detention



Continuous Simulation Results

A continuous simulation modeling analysis was performed based on 1970 – 2006 rainfall data obtained from the U.S. EPA's National Stormwater Calculator for the Los Angeles Downtown/USC gauge, which is located in closest proximity to the site. Average monthly evaporation data is also used from this gauge. While hourly data is used in the continuous simulation modeling analysis, daily events are summarized in this figure. Figure 7 illustrates historical daily rainfall depths during the period of record from 1970 – 2006 recorded at the Los Angeles Downtown/USC gauge. Days without rain are not shown on this graph.

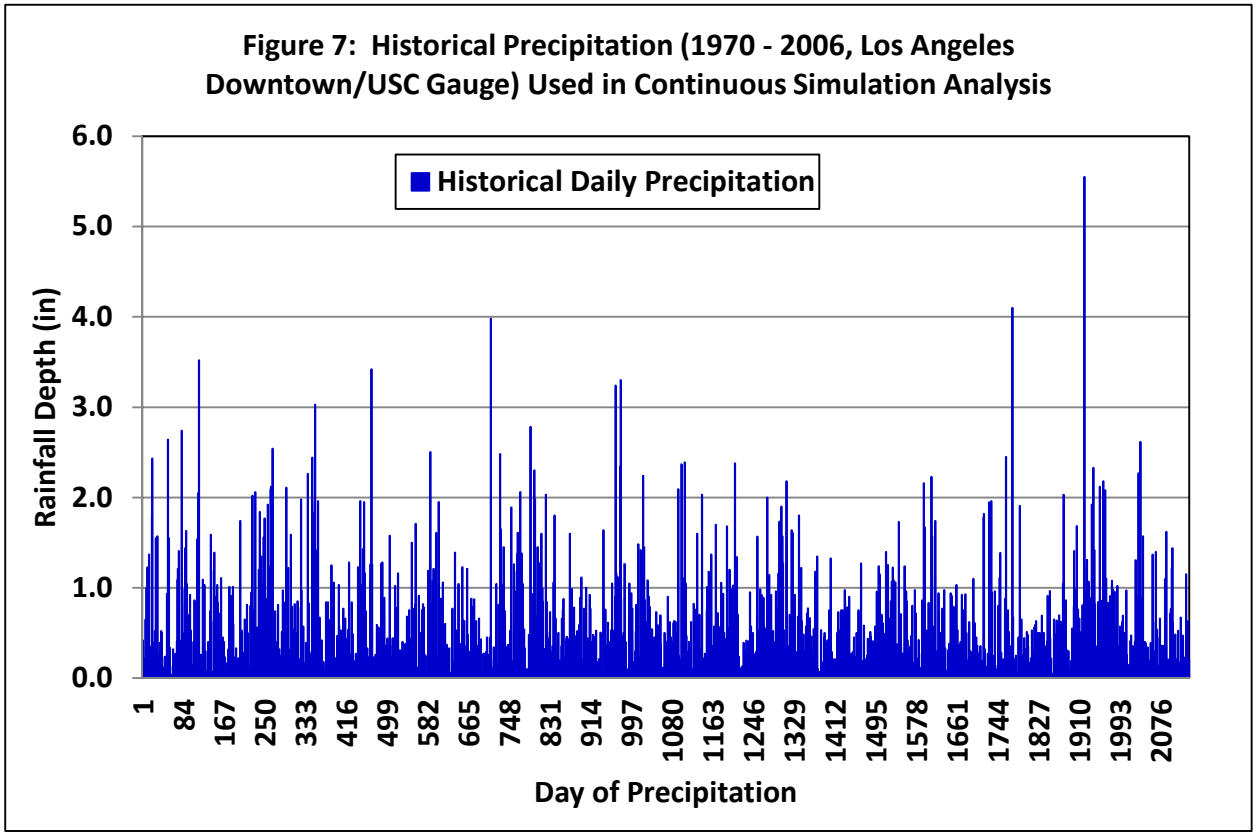
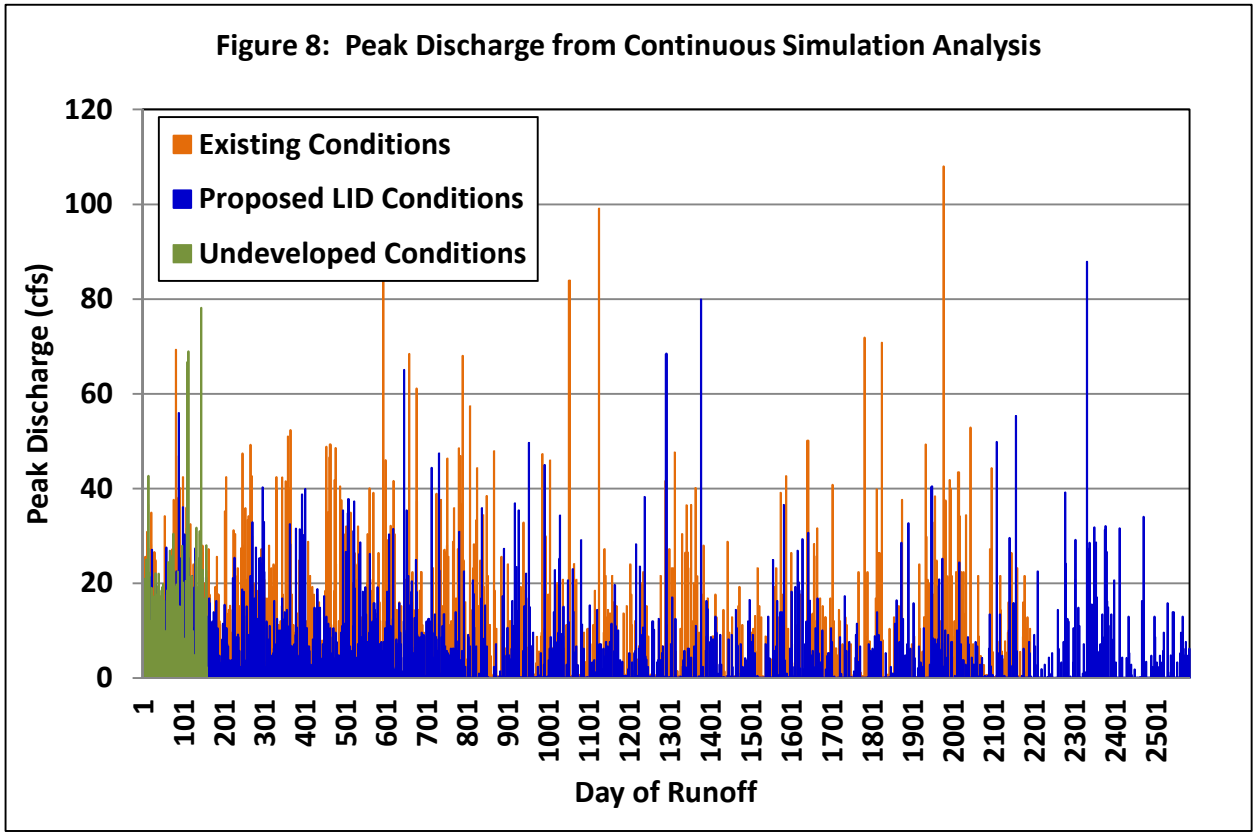


Figure 7: Historical Precipitation (1970 - 2006, Los Angeles Downtown/USC Gauge) Used in Continuous Simulation Analysis

Table 6 includes water balance results for the continuous simulation analysis and summarizes infiltration, runoff, evapotranspiration, and precipitation. During the simulated time period, 570.79 in. of rain occurred. Proposed LID conditions runoff is reduced by 35-percent as compared to existing conditions.

Information on the number of rainfall events producing runoff is summarized in Table 7. There are 991 proposed LID conditions runoff events as compared to 1,052 existing conditions runoff events and 131 undeveloped conditions runoff events. Due to limited data, undeveloped conditions are approximated rather than accurately measured from physical parameters at the site (i.e., soils, slopes, etc.). Figure 8 graphically illustrates runoff in existing and proposed conditions at the site. Note that the day of runoff (x-axis) is for each event and that the days do not correlate for each event. The general pattern is that proposed LID peak discharges are less than existing peak discharges and the proposed site is more similar to the undeveloped site than is the existing site.



Annual maximum peak discharges are depicted in Figure 9 on the following page. Proposed LID conditions maximum annual discharges from the site more closely approximate undeveloped conditions than do discharges from the existing site. In most years, maximum annual discharges from the site are less than existing discharges from the site during the period of record between 1970 and 2006. Note that the actual results are anticipated to change somewhat during final design and modeling depending on the final extent and configuration of LID features and impervious cover within the site.

Since the project in not anticipated to require hydromodification management controls as it is a redevelopment project resulting in lower impervious cover, discharge exceedance frequency curves and flow duration graphs are not included.

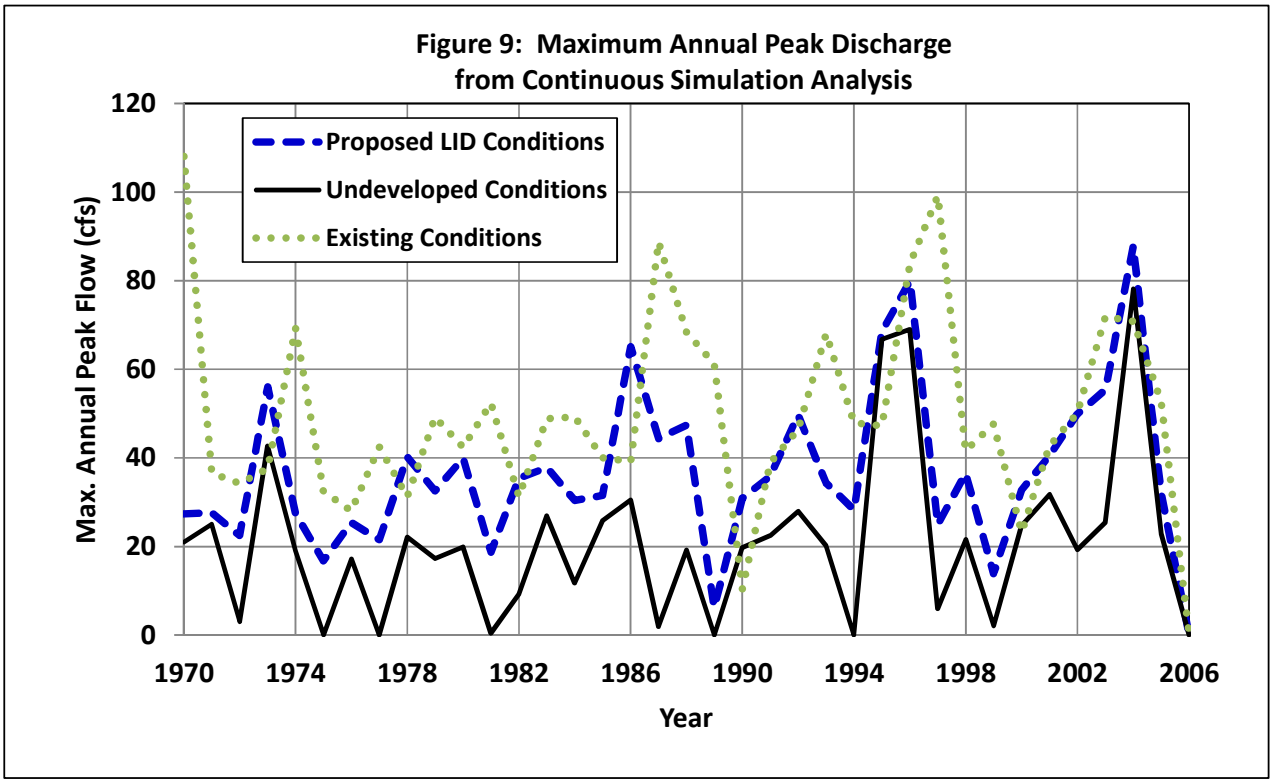


Figure 9: Maximum Annual Peak Discharge
from Continuous Simulation Analysis
Proposed LID Conditions
Undeveloped Conditions
Existing Conditions
Max. Annual Peak Flow (cfs)
120
100
80
60
40
20
0
1970
1974
1978
1982
1986
1990
1994
1998
2002
2006
Year

Conclusions

The LAC+USC Medical Center project meets established project goals:

- ✓ Meet Los Angeles County LID and stormwater treatment criteria
- ✓ Reduce proposed LID conditions peak flows and runoff volumes to below existing conditions
- ✓ Shift the water budget and site hydrology towards undeveloped conditions with improved infiltration and groundwater recharge as compared to existing conditions

Detailed water budget modeling results from EPA SWMM are included in Appendix C.

To ensure the long-term functionality of the LID features and performance of the site, development of and compliance with an Operations & Maintenance (O&M) Plan is critical. Additionally, proper construction sequencing is critical to avoid premature sedimentation of the facilities.

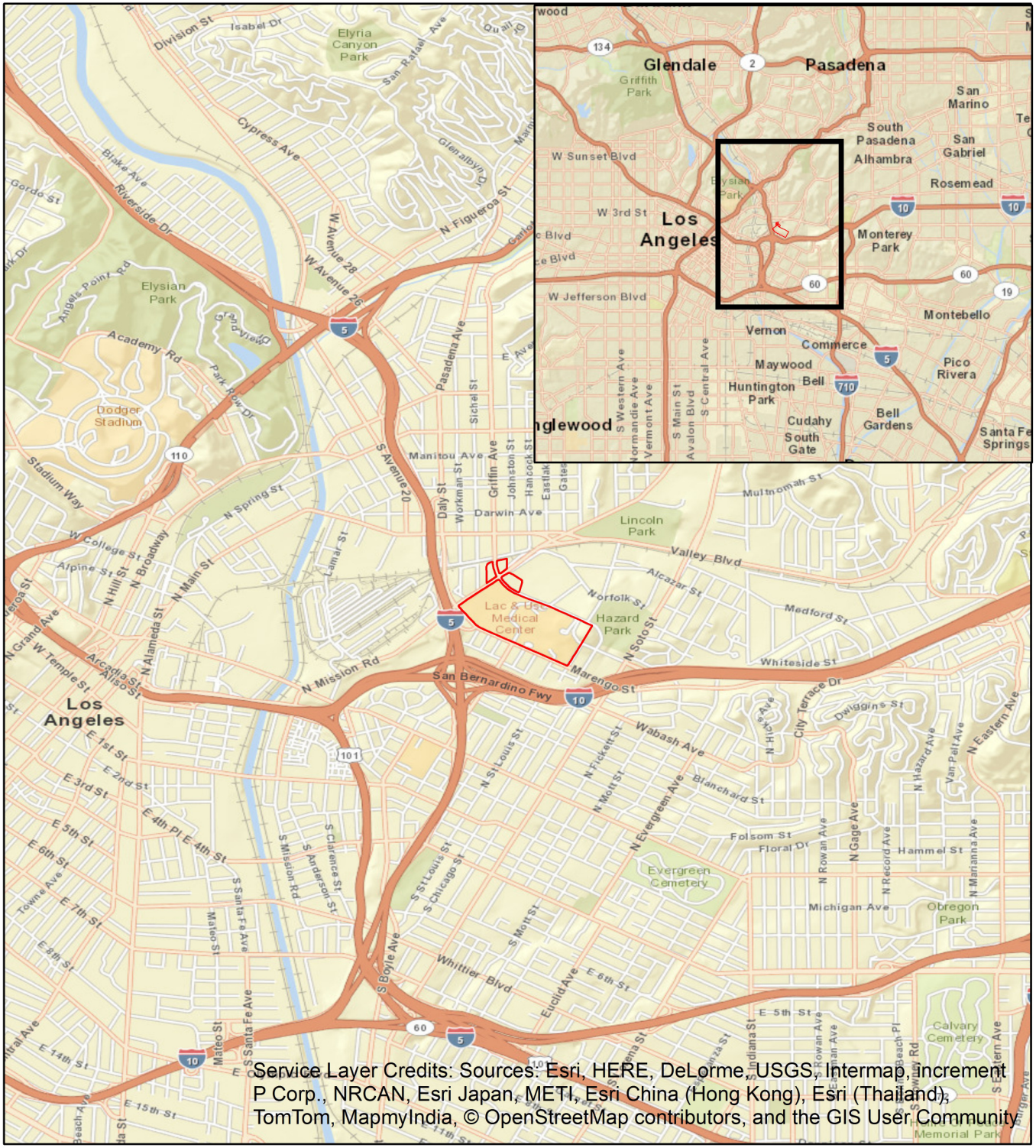
Redevelopment of the LAC+USC Medical Center site represents a significant opportunity for sustainability and LID retrofits within a densely urbanized area and for implementation of Green Infrastructure and LID for Los Angeles County. Thank-you for the opportunity to collaborate on this visionary project.

APPENDICES

Appendix A – Exhibits
Appendix B – Tables of Modeling Data and Results
Appendix C – EPA SWMM Water Budget Results

Watearth™
Water Resources + Green Infrastructure

APPENDIX A - EXHIBITS



Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

North

0 2,500 5,000 10,000 Feet

1 inch = 4,000 feet

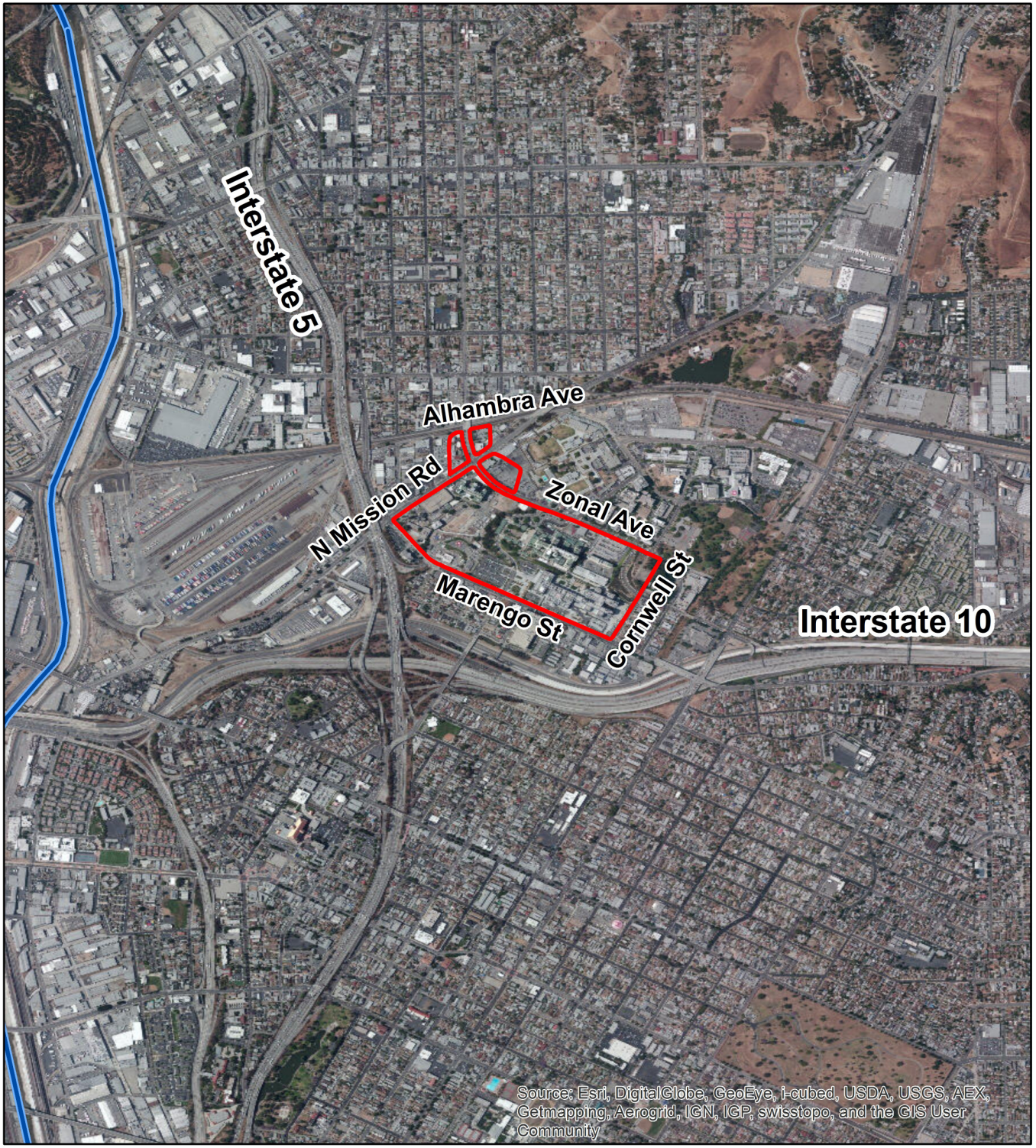
Legend

Project Boundary

Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 1
VICINITY MAP



North

Feet

0 1,250 2,500 5,000

1 inch = 2,000 feet

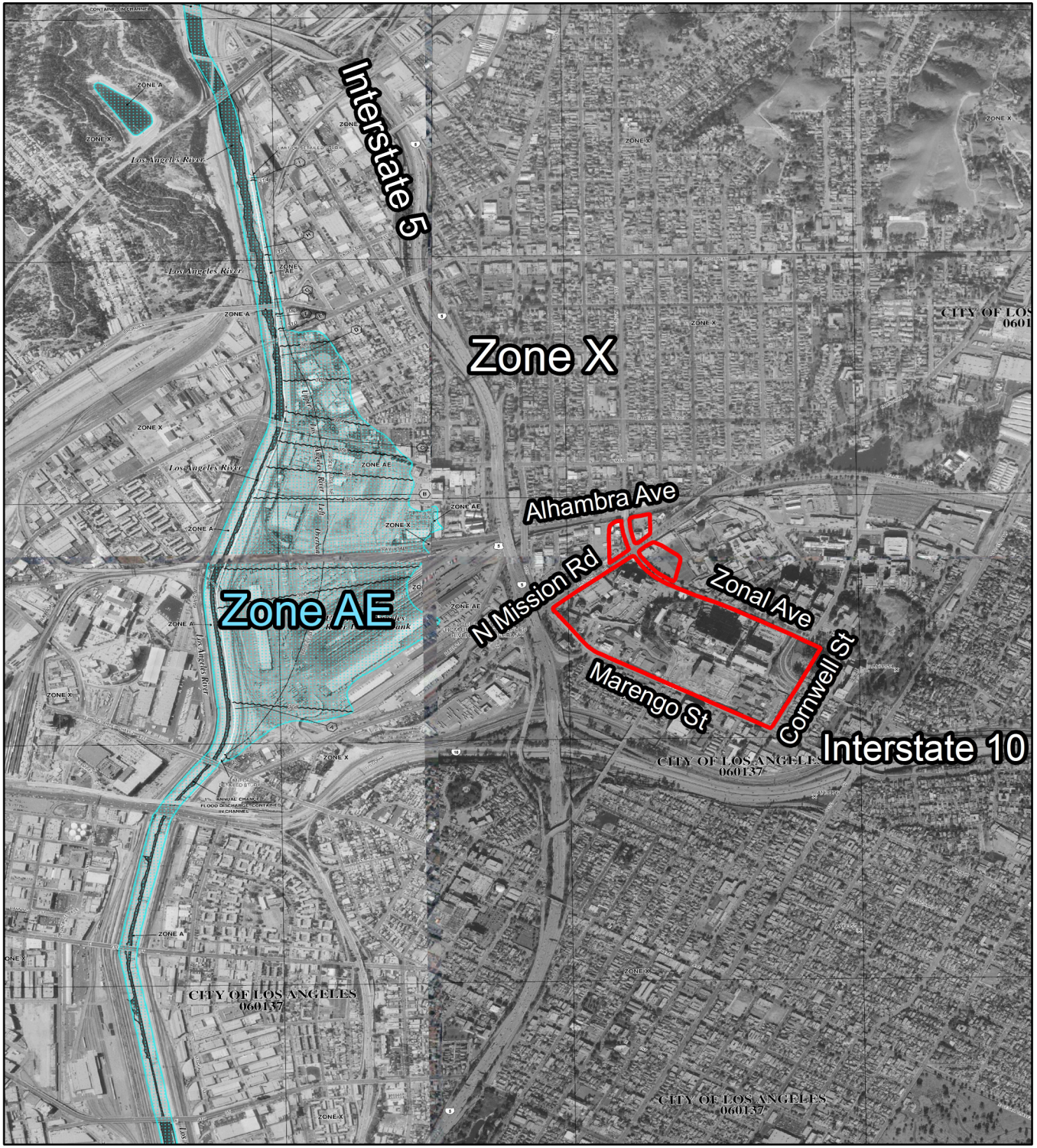
Legend

- Los Angeles River
- Project Boundary

Watearth™

LA+USC Medical Center Master Plan

EXHIBIT 2
AERIAL PHOTOGRAPH



North

Feet

0 1,200 2,400 4,800

1 inch = 2,000 feet

Legend

Project Boundary

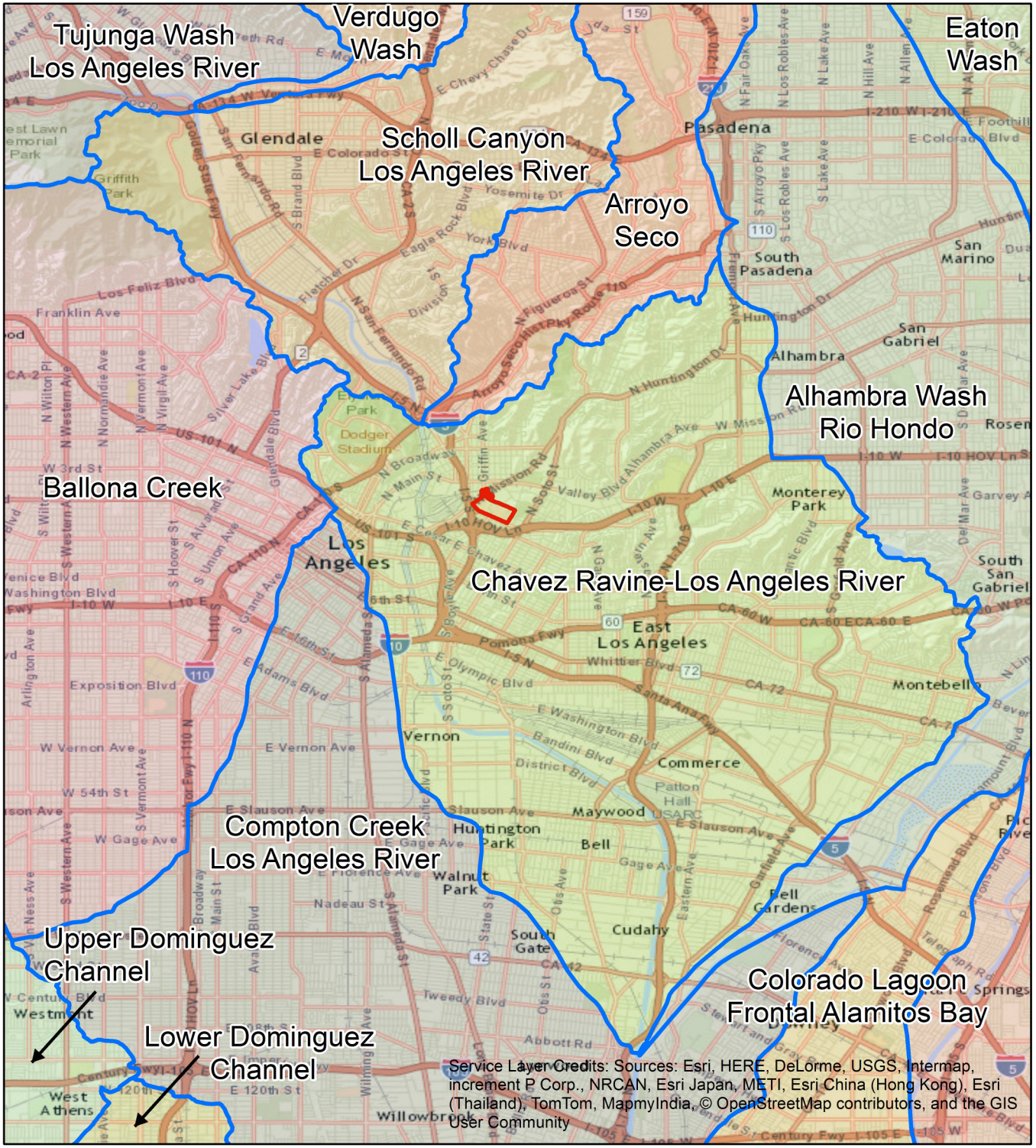
Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 3

FIRM PANELS

06037C1628F, 06037C1629F,
06037C1636F, 06037C1637F
Panels updated 9/26/2008



North

Feet

0 7,500 15,000 30,000

1 inch = 12,500 feet

Legend

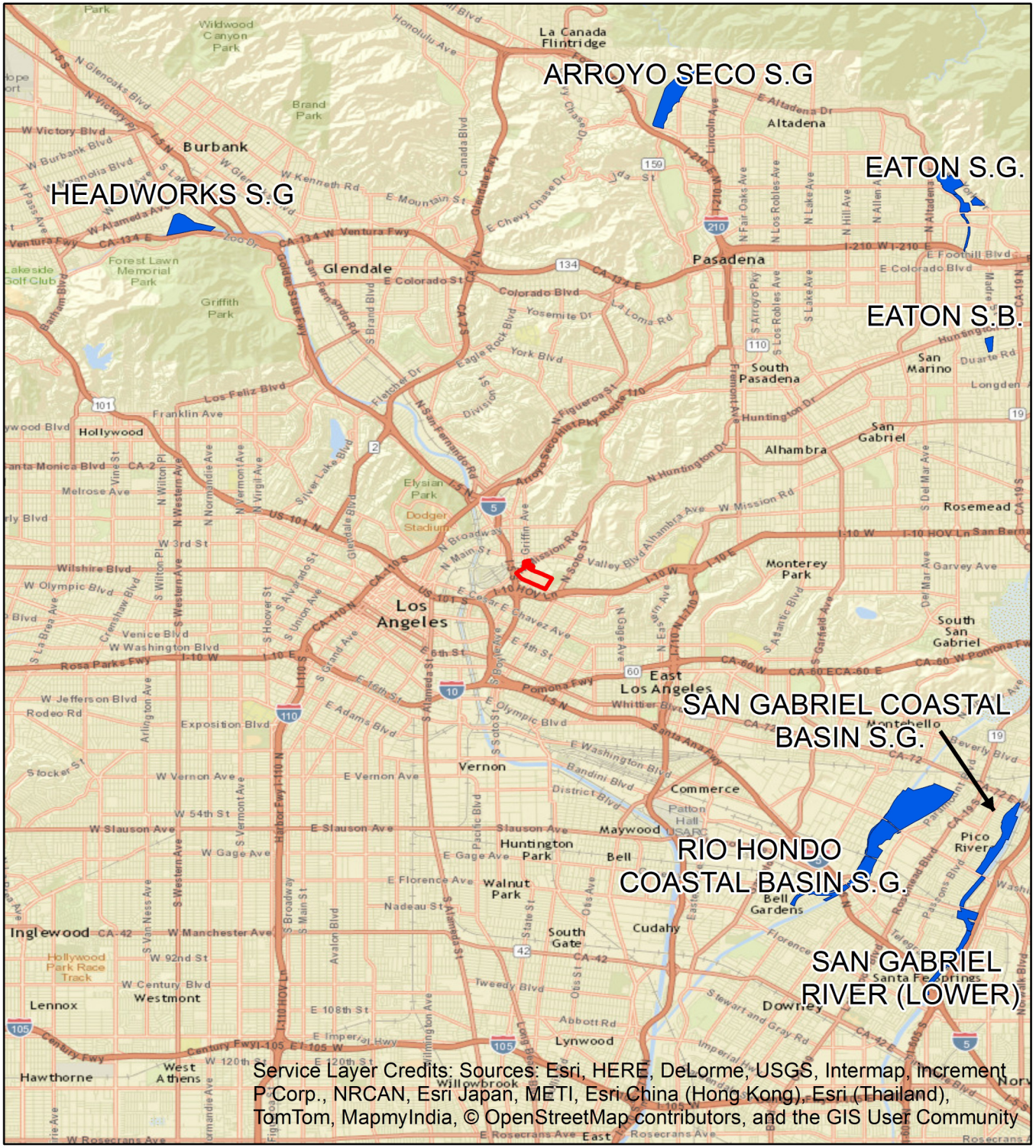
- USGS NHD Subwatershed
- Project Boundary

Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 4

Subwatershed Boundaries



North

Feet

0 9,000 18,000 36,000

1 inch = 15,000 feet

Legend

Spreading Grounds

Project Boundary

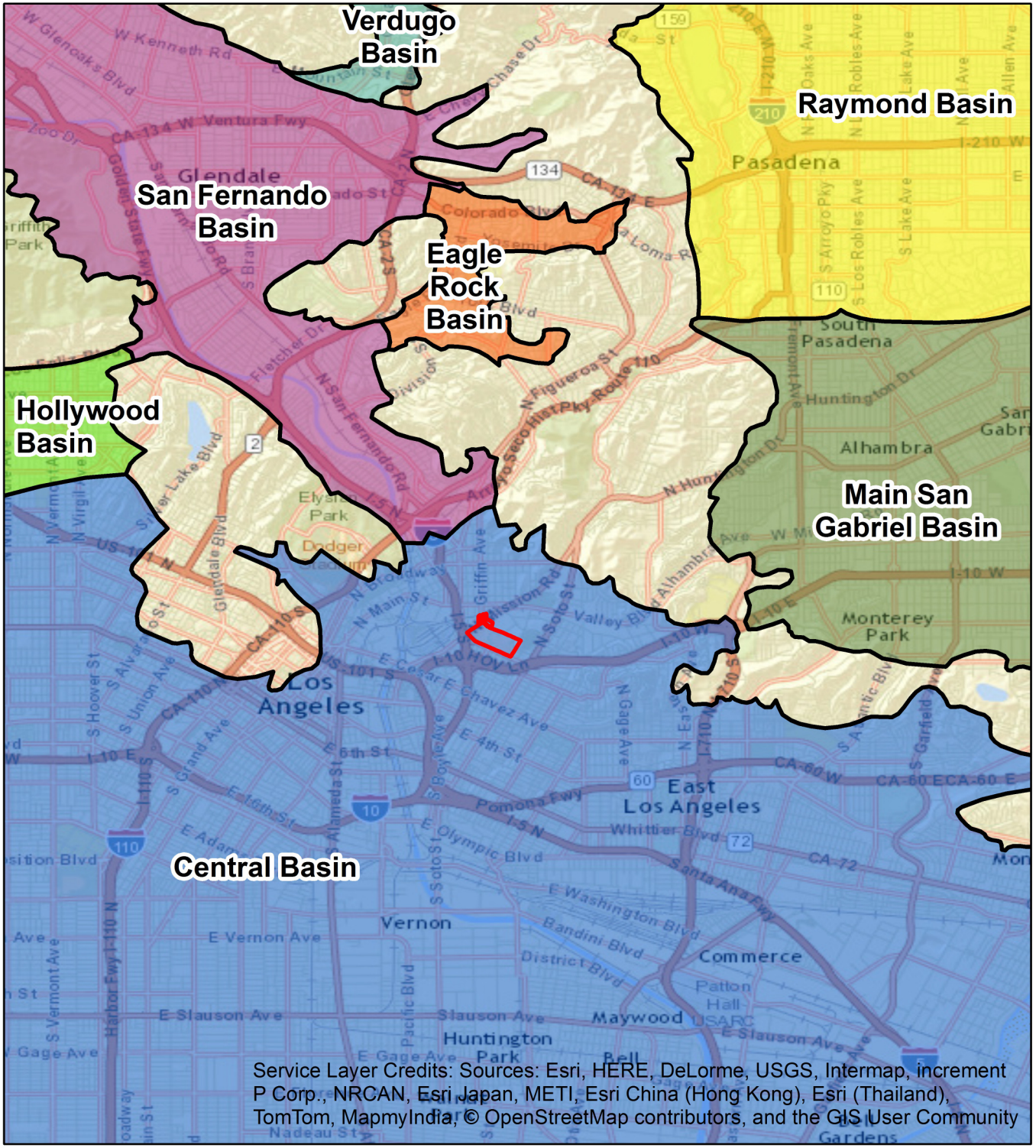
Watearth™

LA+USC Medical Center

EXHIBIT 5

Stormwater Spreading Grounds

Spreading Grounds data from Los Angeles Co. Dept. of Public Works



North

0 6,250 12,500 25,000 Feet

1 inch = 10,000 feet

Legend

- Ground Water Basins
- Project Boundary

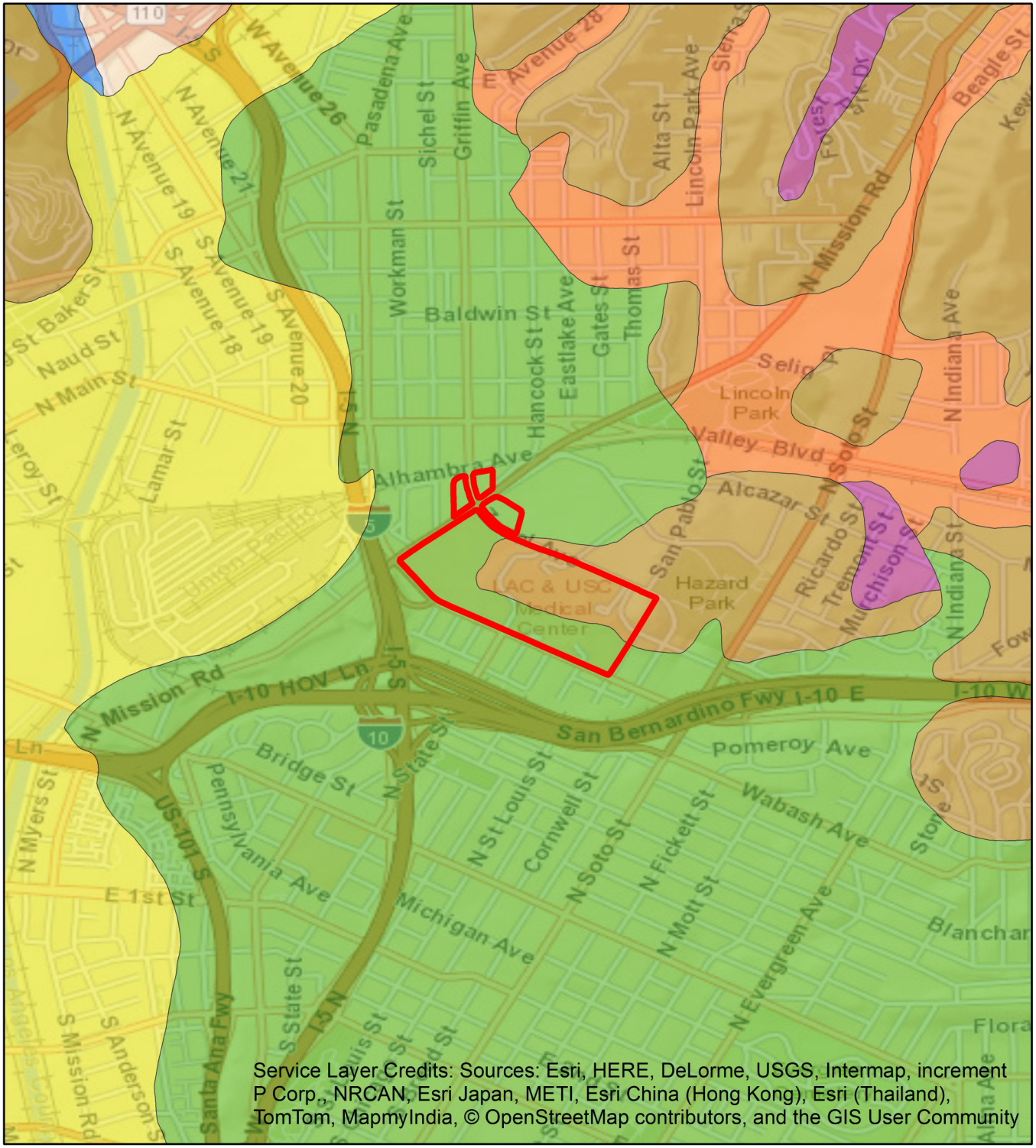
Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 6

Groundwater Basins

Ground water basin data from
Los Angeles Co. Dept. of Public Works



North

Feet

0 1,300 2,600 5,200

1 inch = 2,000 feet

- Project Boundary
- Altamont Clay Loam
- Ramona Loam
- Yolo Clay Loam
- Tujunga Fine Sandy Loam
- Handford Gravelly Sandy Loam
- Handford Fine Sandy Loam
- Diablo Clay Loam

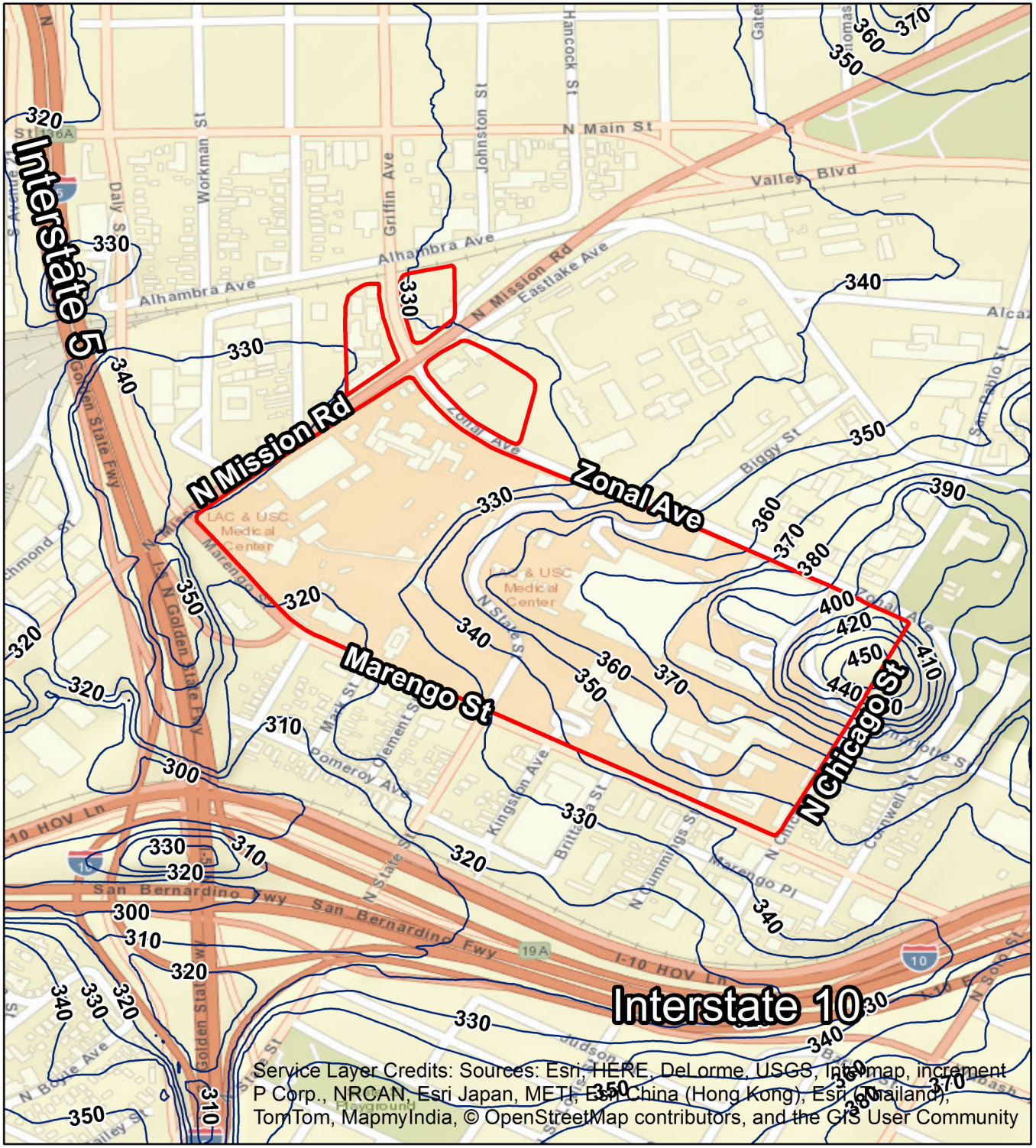
Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 7

Soil Types

Soil data from Los Angeles Co.
Dept. of Public Works, Water Resources Division



North

0 500 1,000 2,000 Feet

1 inch = 750 feet

Legend

- Project Boundary
- 10ft Contour

Watearth™

LA+USC Medical Center Master Plan EIR

EXHIBIT 8

Topographic Map

Elevation data from
USGS National Elevation Dataset

Watearth™
Water Resources + Green Infrastructure

APPENDIX A1 - LAC+USC MEDICAL CAMPUS PROPOSED STORMWATER CONVEYANCE CONCEPT PLANS

WATER DETENTION AREA

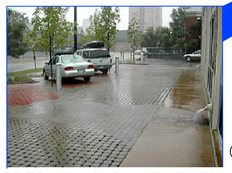
Q_{25}=42.8 CFS, T_C=5 MIN
Q_{50}=48.48 CFS, T_C=5 MIN
Q_{100}=54.08 CFS, T_C=5 MIN
Q_{SUSMP}=2.20 CFS, T_C=22 MIN

Q_{25}=21.53 CFS, T_C=7 MIN
Q_{50}=24.35 CFS, T_C=7 MIN
Q_{100}=29.13 CFS, T_C=6 MIN
Q_{SUSMP}=1.47 CFS, T_C=28 MIN

Q_{25}=27.53 CFS, T_C=5 MIN
Q_{50}=31.12 CFS, T_C=5 MIN
Q_{100}=24.71 CFS, T_C=5 MIN
Q_{SUSMP}=1.83 CFS, T_C=21 MIN

BIOSWALE/RAINGARDENS

Q_{25}=8.91 CFS, T_C=7 MIN
Q_{50}=10.82 CFS, T_C=6 MIN
Q_{100}=12.05 CFS, T_C=6 MIN
Q_{SUSMP}=0.63 CFS, T_C=26 MIN



PERVIOUS PAVEMENT

Q_{25}=31.01 CFS, T_C=5 MIN
Q_{50}=35.05 CFS, T_C=5 MIN
Q_{100}=39.10 CFS, T_C=5 MIN
Q_{SUSMP}=1.69 CFS, T_C=23 MIN

Q_{25}=20.34 CFS, T_C=10 MIN
Q_{50}=24.09 CFS, T_C=9 MIN
Q_{100}=26.89 CFS, T_C=9 MIN
Q_{SUSMP}=1.59 CFS, T_C=30 MIN

Q_{25}=24.51 CFS, T_C=6 MIN
Q_{50}=27.66 CFS, T_C=6 MIN
Q_{100}=33.62 CFS, T_C=5 MIN
Q_{SUSMP}=1.70 CFS, T_C=23 MIN

Q_{25}=10.14 CFS, T_C=5 MIN
Q_{50}=11.47 CFS, T_C=5 MIN
Q_{100}=12.79 CFS, T_C=5 MIN
Q_{SUSMP}=0.79 CFS, T_C=15 MIN

LAC+USC MEDICAL CAMPUS
PROPOSED STORMWATER CONVEYANCE CONCEPT PLANS

LOS ANGELES, CALIFORNIA

LEGEND:

- RIGHT-OF-WAY LINE
- CENTER LINE
- EXISTING OFF-SITE STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING BUILDING TO REMAIN
- PROPOSED BUILDING
- WETLAND/DETENTION AREA
- PERVIOUS PAVEMENT
- BIOSWALE AREA
- SUB-AREA LINE
- LONGEST FLOW PATH
- FLOW PATH ANNOTATION
- HYDROLOGY SUB-AREA NUMBER AND ACREAGE
- HYDROLOGY AREA CONFLUENCE POINT
- DIRECTIONAL FLOW ARROW

GRAPHIC SCALE IN FEET
0 40 80 160

Kimley-Horn and Associates, Inc.

Engineering, Planning, and Environmental Consultants
765 The City Drive, Suite 200
Orange, California 92868 (714) 939-1030

APPENDIX B – TABLES OF MODELING DATA AND RESULTS

TABLE 1: LAC+USC MEDICAL CENTER EIR SUMMARY OF HYDROLOGIC PARAMETERS

Hydrologic Parameters																	
Area (ac)	24-hr Rainfall Data		Impervious Cover (%)			Overland Flow Length (ft)		Width (A/L) (ft)		Slope (%)			Depression Storage (in)		Manning's n-value Impervious	Manning's n-value Pervious		
	10-yr	100-yr	Undev	Exist	Prop	Undev	Exist & Prop	Undev	Exist & Prop	Undev	Exist	Prop	Impervious	Pervious		Undev	Exist	Prop
83.61	4.84	7.87	0.0%	95%	75.0%	500	200	7,284	18,210	4.8%	4.8%	4.8%	0.06	0.25	0.011	0.32	0.24	0.24

Notes:

1. Hydrologic modeling performed in EPA SWMM5.0.022.
2. Site assumed to route to outlet in undeveloped conditions and 0% disconnected impervious cover assumed in existing conditions as detailed topographic and grading data not available.
3. Undeveloped conditions assumed.
4. Tree canopy interception neglected as not significant for this project.
5. Evaporation data based on 1970 - 2006 data from Los Angeles Downtown/USC gauge obtained from the EPA National Stormwater Calculator.
6. Undeveloped Manning's n-value for pervious areas assumed between dense grass and woods with light underbrush. Existing Manning's n-value for pervious areas assumed as dense grass.
7. Proposed Manning's n-value for pervious areas assumed as dense grass or an approximate average between turf grass and native vegetation.
8. Continuous simulation model based on 1970 - 2006 data from Los Angeles Downtown/USC gauge obtained from the EPA National Stormwater Calculator.
9. Existing impervious cover of 95% approximated from aerial photograph and proposed impervious cover assumed from campus rendering from *Master Plan* .
10. Proposed includes ultimate redevelopment of LA+USC Medical Center with Low Impact Development (LID) features.
11. Existing slope assumed as typical site average and proposed slope assumed same as existing based on information in *Master Plan* . Since no data available, undeveloped slope assumed same as existing.
12. Overland flow length of 500 feet (ft) assumed as maximum for undeveloped conditions based on SWMM User's Manual. Existing and proposed conditions limited to 200 ft due to channelized flow on paved surfaces.
13. Rainfall data based on National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 6 from the Ascot Reservoir gauge.

TABLE 2: LAC+USC MEDICAL CENTER EIR GREEN & AMPT SOILS PARAMETERS

Native Soil Green & Ampt Parameters			Growing Media Green & Ampt Parameters						
Suction Head (in)	Conductivity (in/hr)	Initial Deficit	Suction Head (in)	Conductivity (in/hr)	Initial Deficit	Field Capacity	Effective Porosity	Wilting Point	Conductivity Slope
5.885	0.085	0.305	2.4	1.18	0.382	0.105	0.437	0.047	8.0

Notes:

1. Native soil classified as Ramona Loam and Altamont Clay Loam from LA County soils and GIS data.
2. Suction head and hydraulic conductivity for native soil based on average of clay loam and loam values from EPA *SUSTAIN User's Manual*
3. Initial moisture deficit for Western U.S. assumed as average of clay loam and loam from www.water-research.net
4. Conductivity and suction head values assumed for growing media from EPA *SUSTAIN User's Manual* .
   The conductivity value was selected to simulate long-term saturated hydraulic conductivity in the event of loss of capacity over time.
5. Loamy sand classification assumed for growing media and depths shown on Table 4.
6. Conductivity slope assumed from standard tables in SWMM5.0.021 User's Manual based on sandy loam growing media.

TABLE 3: LAC+USC MEDICAL CENTER EIR LID FEATURES AREAS AND CONTRIBUTING AREAS

LID Feature	LID Area (sq. ft.)	Drainage Area/ Area Treated (ft^2)	Pervious Area Treated (ft^2)	Impervious Area Treated (ft^2)	% Impervious Area Treated	Outflow to Pervious
Bioretention	70,436	414,167	0	414,167	11%	No
Permeable Pavement	170,446	170,446	0	170,446	5%	No
Wetlands/Detention	31,804	68,681	0	68,681	2%	No
TOTALS		653,294	0	653,294	18%	

Notes:

1. Surface areas based on LAC+USC MEDICAL CAMPUS PROPOSED STORMWATER CONVEYANCE CONCEPT PLANS prepared by Kimley-Horn & Associates, Inc.
2. Total Area Treated = drainage area contributing to LID feature.
2. % impervious area treated is percent of impervious area in entire project drainage area as the aggregated method of LID modeling is used due to the site size.
3. Permeable pavement modeled as 100% impervious and perviousness and storage handled as an LID control.
4. Green roof (agricultural/urban farm) and cisterns for stormwater harvesting and use not included as they are not specifically programmed.

TABLE 4: LAC+USC MEDICAL CENTER EIR LID CONFIGURATIONS

LID Feature	Perm. Pvmt. Thickness (in)	Perm. Pvmt. Infilt. (in/hr)	Perm. Pvmt. Void Ratio	Avg. Surface Depth (in)	Surface Slope (%)	Top Width (ft)	Surface Veg. Volume Fraction	Manning's n-value	Depth Soil Media (in)	Initial Media Saturation (%)	Drain Rock (in)	Void Ratio	Underdrain?
Bioretention	---	---	---	18	---	25	0.05	---	36	0/50	12	0.5	yes
Permeable Pavement	4	100	0.18	---	2.00	50	---	0.011	---	0/50	24	0.5	yes
Wetlands/Detention	---	---	---	48	---	50	0.05	---	24	0/50	---	---	no

Notes:

1. Green & Ampt hydraulic parameters for growing media (amended soil) based on sandy loam with a hydraulic conductivity of 1.18 in/hr (see Table 2 for details).
2. Hydraulic conductivity of 0.085 in/hr assumed for underlying (native) soil (see Table 2 for details).
3. No clogging assumed on permeable pavement (i.e., maintenance at appropriate intervals assumed).
4. Initial media saturation used for design storm events only and not continuous simulation model.
5. Surface depth and growing media depth for bioretention and wetlands/detention based on required two to three feet from February, 2014 County of Los Angeles Department of Public Works *Low Impact Development Standards Manual* .
6. Wetlands/detention modeled as bioretention due to planning-level nature of analysis.
7. Thickness of porous asphalt and void ratio of gravel reservoir assumed.
8. Permeable pavement infiltration rate assumed and void ratio based on average between typical range of 0.12 - 0.21 from SWMM5.0.022 documentation.
9. Slope of 2% for permeable pavement assumed as located in flatter portions of site.
10. Manning's n-value for permeable pavement based on typical asphalt n-values.
11. 4-inch underdrains in Permeable Pavement and Bioretention assumed to be elevated 6 inches above bottom of gravel reservoir.
12. Void ratios assumed for gravel storage reservoirs.

TABLE 4A: LAC+USC MEDICAL CENTER EIR STORMWATER QUALITY VOLUME

LID Feature	Storage Volume (cu. ft.)			
	Surface Storage	Growing Media	Drain Rock	Total
Bioretention	2.43	1.46	0.42	4.30
Permeable Pavement	0.00	0.00	2.03	2.03
Wetlands/Detention	1.46	1.46	0.00	2.92
TOTAL	3.89	2.92	2.46	9.26
REQUIRED	6.62			6.62
EXCESS/DEFICIT	-2.73			2.64

Notes:

1. Surface areas based on LAC+USC MEDICAL CAMPUS PROPOSED STORMWATER CONVEYANCE CONCEPT PLANS prepared by Kimley-Horn & Associates, Inc.
2. Water quality volume required based on 0.95-inch 85th-percentile, 24-hour rainfall event.
3. Storage volumes approximate based on surface area of LID features. Final designs may need to vary to meet required stormwater quality volumes.
4. Effective porosities of 30% and 26% used for growing media and drain rock, respectively. Effective porosites based on data in NCSU *Urban Waterways* article entitled Designing Bioretention with an Internal Water Storage (IWS) Layer.

TABLE 5: LAC+USC MEDICAL CENTER EIR DESIGN STORM EVENTS RESULTS

System Results	10-yr, 24-hr Design Storm					100-yr, 24-hr Design Storm				
	Undev.	Exist.	Prop.	% from Undev.	% from Exist.	Undev.	Exist.	Prop.	% from Undev.	% from Exist.
Initial LID Storage (in)	---	---	0.402	---	---	---	---	0.402	---	---
Precipitation (in)	4.540	4.540	4.540	0%	0%	7.140	7.140	7.140	0%	0%
Surface Runoff (in)	3.655	4.322	3.543	-3%	-18%	3.062	6.901	5.953	94%	-14%
Infiltration (in)	0.878	0.177	1.121	28%	533%	4.066	0.198	1.219	-70%	516%
Evaporation (in)	0.008	0.047	0.045	---	-4%	0.013	0.047	0.046	---	-2%
Peak Flows (cfs)	30.9	205.5	154.7	401%	-25%	98.8	328.1	252.9	156%	-23%

Notes:

1. Undeveloped conditions refers to historical site with no development.
2. Existing conditions refers to current conditions at site with existing development.
3. Proposed conditions is proposed ultimate build-out of *Master Plan* facilities with LID features.
4. Initial LID Storage due to assumed 50% saturation used in design storm models.

TABLE 6: LAC+USC MEDICAL CENTER EIR
CONTINUOUS SIMULATION WATER BALANCE OUTPUT

System Results	Analysis Period Results			Difference Between LID Model and Other Conditions			
	Undeveloped	Existing	Proposed	vs. Undeveloped	vs. Existing	% from Undeveloped	% from Existing
Precipitation (in)	570.79	570.79	570.79	0.00	0.00	0%	0%
Surface Runoff (in)	46.59	494.94	323.42	276.84	-171.51	594%	-35%
Infiltration (in)	521.49	25.39	192.27	-329.22	166.87	-63%	657%
Evaporation (in)	2.86	51.54	56.74	53.88	5.20	1881%	10%

Notes:

1. Water balance output is for full continuous simulation run.
2. Initial saturation of 0% (wilting point) used for growing media at start of continuous simulation run.
3. Undeveloped conditions refers to historical site with no development.
4. Existing conditions refers to current conditions at site with existing development.
5. Proposed conditions is proposed ultimate build-out of *Master Plan* facilities with LID features.

TABLE 7: LAC+USC MEDICAL CENTER EIR NUMBER OF RUNOFF EVENTS FROM CONTINUOUS SIMULATION ANALYSIS

Run	Number Runoff Events
Undeveloped Conditions	131
Existing Conditions	1,052
Proposed LID Conditions	991

Notes:

1. 589 precipitation events ≥ 0.10 in.
2. 6-hour inter-event duration used.

APPENDIX C – EPA SWMM WATER BUDGET RESULTS

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-2000 00:00:00
Ending Date JAN-03-2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	31.632	4.540
Evaporation Loss	0.054	0.008
Infiltration Loss	25.463	3.655
Surface Runoff	6.121	0.878
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.018	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	4.54	0.00	0.01	3.65	0.88	1.99	30.85	0.193

Analysis begun on: Sun Jul 13 05:32:37 2014
Analysis ended on: Sun Jul 13 05:32:37 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-2000 00:00:00
Ending Date JAN-03-2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	31.632	4.540
Evaporation Loss	0.327	0.047
Infiltration Loss	1.232	0.177
Surface Runoff	30.112	4.322
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.124	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	4.54	0.00	0.05	0.18	4.32	9.81	205.49	0.952

Analysis begun on: Sun Jul 13 05:24:08 2014
Analysis ended on: Sun Jul 13 05:24:08 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-2000 00:00:00
Ending Date JAN-03-2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Initial LID Storage	2.804	0.402
Total Precipitation	31.632	4.540
Evaporation Loss	0.311	0.045
Infiltration Loss	7.808	1.121
Surface Runoff	24.689	3.543
Final Surface Storage	1.672	0.240
Continuity Error (%)	-0.124	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	4.54	0.00	0.04	1.12	3.54	8.04	154.70	0.780

****
LID Performance Summary
****

Subcatchment	LID Control	Total Inflow in	Evap Loss in	Infil Loss in	Surface Outflow in	Drain Outflow in	Init. Storage in	Final Storage in	Po Er
LA+USC	Wetlands/Detention	11.69	0.14	4.09	0.00	0.00	4.68	12.15	
LA+USC	PermeablePavement	7.87	0.13	3.94	0.00	7.81	4.00	0.00	-
LA+USC	Bioretention	22.29	0.14	4.09	0.00	20.20	9.02	6.92	-0

Analysis begun on: Mon Jul 14 14:25:07 2014
Analysis ended on: Mon Jul 14 14:25:07 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-2000 00:00:00
Ending Date JAN-03-2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	49.748	7.140
Evaporation Loss	0.091	0.013
Infiltration Loss	28.332	4.066
Surface Runoff	21.336	3.062
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.023	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	7.14	0.00	0.01	4.07	3.06	6.95	98.84	0.429

Analysis begun on: Mon Jul 14 14:34:39 2014
Analysis ended on: Mon Jul 14 14:34:39 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-2000 00:00:00
Ending Date JAN-03-2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	49.748	7.140
Evaporation Loss	0.329	0.047
Infiltration Loss	1.381	0.198
Surface Runoff	48.084	6.901
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.093	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	7.14	0.00	0.05	0.20	6.90	15.67	328.14	0.967

Analysis begun on: Mon Jul 14 14:31:38 2014
Analysis ended on: Mon Jul 14 14:31:38 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-2000 00:00:00
Ending Date JAN-03-2000 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Initial LID Storage	2.804	0.402
Total Precipitation	49.748	7.140
Evaporation Loss	0.321	0.046
Infiltration Loss	8.493	1.219
Surface Runoff	41.475	5.953
Final Surface Storage	2.317	0.333
Continuity Error (%)	-0.101	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	7.14	0.00	0.05	1.22	5.95	13.51	252.86	0.834

****
LID Performance Summary
****

Subcatchment	LID Control	Total Inflow in	Evap Loss in	Infil Loss in	Surface Outflow in	Drain Outflow in	Init. Storage in	Final Storage in	Po Er
LA+USC	Wetlands/Detention	18.42	0.14	4.09	0.00	0.00	4.68	18.88	
LA+USC	PermeablePavement	12.40	0.13	3.94	0.02	12.32	4.00	0.00	-
LA+USC	Bioretention	35.15	0.14	4.09	0.00	31.35	9.02	8.67	-0

Analysis begun on: Mon Jul 14 14:27:16 2014
Analysis ended on: Mon Jul 14 14:27:16 2014
Total elapsed time: < 1 sec

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-1970 00:00:00
Ending Date DEC-31-2006 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

****
Rainfall File Summary
****

Station ID	First Date	Last Date	Recording Frequency	Periods w/Precip	Periods Missing	Periods Malfunc.
045115	JAN-09-1970	DEC-27-2006	60 min	7468	0	0

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	3976.951	570.786
Evaporation Loss	19.953	2.864
Infiltration Loss	3633.484	521.490
Surface Runoff	324.597	46.587
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.027	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	570.79	0.00	2.86	521.49	46.59	105.77	78.18	0.082

Analysis begun on: Sun Jul 13 07:29:52 2014
Analysis ended on: Sun Jul 13 07:29:57 2014
Total elapsed time: 00:00:05

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-1970 00:00:00
Ending Date DEC-31-2006 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

****
Rainfall File Summary
****

Station ID	First Date	Last Date	Recording Frequency	Periods w/Precip	Periods Missing	Periods Malfunc.
045115	JAN-09-1970	DEC-27-2006	60 min	7468	0	0

********** Runoff Quantity Continuity **********	Volume acre-feet	Depth inches
Total Precipitation	3976.951	570.786
Evaporation Loss	359.099	51.539
Infiltration Loss	176.927	25.393
Surface Runoff	3448.476	494.937
Final Surface Storage	0.000	0.000
Continuity Error (%)	-0.190	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	570.79	0.00	51.54	25.39	494.94	1123.65	108.03	0.867

Analysis begun on: Sun Jul 13 07:24:33 2014
Analysis ended on: Sun Jul 13 07:24:38 2014
Total elapsed time: 00:00:05

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... NO
  Water Quality ..... NO
Infiltration Method ..... GREEN_AMPT
Starting Date JAN-01-1970 00:00:00
Ending Date DEC-31-2006 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 00:05:00

****
Rainfall File Summary
****

Station ID	First Date	Last Date	Recording Frequency	Periods w/Precip	Periods Missing	Periods Malfunc.
045115	JAN-09-1970	DEC-27-2006	60 min	7468	0	0

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	3976.951	570.786
Evaporation Loss	395.353	56.742
Infiltration Loss	1339.615	192.266
Surface Runoff	2253.459	323.424
Final Surface Storage	0.084	0.012
Continuity Error (%)	-0.291	

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
LA+USC	570.79	0.00	56.74	192.27	323.42	734.27	87.88	0.567

****
LID Performance Summary
****

Subcatchment	LID Control	Total Inflow in	Evap Loss in	Infil Loss in	Surface Outflow in	Drain Outflow in	Init. Storage in	Final Storage in	Po Er
LA+USC	Wetlands/Detention	1394.91	498.62	897.73	0.00	0.00	0.00	0.00	

LA+USC	PermeablePavement	955.23	33.20	849.72	0.00	82.63	0.00	0.00	-
LA+USC	Bioretention	2617.43	682.84	1381.41	0.00	563.01	0.00	0.62	-0

Analysis begun on: Mon Jul 14 13:22:50 2014
Analysis ended on: Mon Jul 14 13:23:02 2014
Total elapsed time: 00:00:12