APPENDIX H

Drainage Study

SOUTHLAND CIVIL ENGINEERING & SURVEY, LLP
ENGINEERING DONE RIGHT ... FROM THE START

PRELIMINARY DRAINAGE STUDY

for

6220 WEST YUCCA STREET MIXED USED DEVELOPMENT
6220 West Yucca Street
Los Angeles, California 90028

Prepared for:

CHAMPION REALTY, LTD
11601 Wilshire Boulevard, Suite 1650
Los Angeles, CA 90025

February 19, 2016
REVISED July 11, 2017

REGISTERED PROFESSIONAL ENGINEER
STEPHEN H. LEWIS
No. 70304
Exp. 9/30/18
CIVIL
STATE OF CALIFORNIA

7/21/17

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Project No. 780-15020

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i. INTRODUCTION

The project site is located in the City of Los Angeles, CA, on four separate parcels with three (3) different address ranges within the Hollywood Community: 6220-6224, 6210-6216 Yucca Street and 1765-1779 N. Vista Del Mar. The westerly parcel is currently developed with three (3) multi-family buildings, two (2) detached covered parking garages and landscaping. The two southeasterly parcels are each currently developed with one (1) single family residential dwelling unit, a detached garage, and landscaping. The northeast parcel is currently developed as a parking lot. The project site is a total of 1.16 acres and is bound by Yucca Street to the north, Argyle Avenue to the west, Vista Del Mar Avenue to the east, an abandoned park to the southwest, and residential lot to the southeast. The proposed project is a mixed used development consisting of a 20-story building on the west that includes a hotel, residential and commercial units, subterranean parking; and a detached 4-story multi-residential building with subterranean parking on the east.

This Preliminary Drainage Study has been prepared in support of the project's Environmental Impact Analysis – required by the California Environmental Quality Act (CEQA). This study includes a two-part analysis discussing 1) the existing hydrological conditions of the project site, and potential hydrological impacts the proposed development will have on the local drainage system; and 2) requirements for surface water quality / low impact development (LID) designs and potential solutions.

PART 1 – HYDROLOGY

1.a Regulatory Framework

The proposed project is subject to hydrologic design methods and procedures outlined in the 2006 Los Angeles County Department of Public Works Hydrology Manual. Per this manual, hydrologic modelling of the site can be done using the Modified Rational Method (Q = C x I x A); where “Q” equals the volumetric flow, “C” equals the runoff model coefficient, “I” equals the rainfall intensity, and “A” equals the tributary drainage area. The tributary drainage area can be determined by delineating high points to create drainage boundaries and any subareas. The rainfall intensity can be determined using isohyet rainfall values (provided by LACDPW Hydrology Manual – see Appendix B.1). The runoff coefficient can be determined as a function of the site topography (slope and flow path length), rainfall intensity, and site development imperviousness.

The proposed project is also subject to the City of Los Angeles Bureau of Engineering Manual Part G – Storm Drain Design and shall incorporate a 10-year design storm frequency to be used for the on-site and off-site hydrologic design per Section G222 of the City Storm Drain Design Manual. A 50-year design storm analysis has also been included as a part of this study to support the project Environmental Impact Analysis.

Requirements under the Regional NPDES MS4 Permit (Order No. R4-2012-0175) include on-site best management practice (BMP) design to mimic predevelopment hydrologic conditions and prevent erosion through hydromodification and control, and stormwater runoff detention. In addition to treating stormwater runoff, proposed volume-based or flow-based BMPs required for the development may detain or retain any potential additional runoff. Construction BMPs required by a stormwater pollution prevention plan (SWPPP) shall prevent erosion and contaminated runoff from discharging off the site. Surface water quality standards and regulations also apply and are discussed in part two of this study.

1.b Existing Conditions

The project site lies in the northern upstream portion of an approximate 35-acre local watershed per the City's Drainage Map 469-3 (see Appendix A.1), and is part of the Ballona Creek urban watershed (see Appendix A.3). The site ultimately drains southwesterly to a 24-inch, City-owned storm drain in Argyle Ave., which then drains southerly to a 90-inch storm drain in Sunset Blvd.

The existing 1.16 site is approximately 87% impervious with 6,580 sf of pervious areas. Topography of the existing site includes two (2) identified drainage subareas, shown in Appendix A.6 – "Existing and Proposed Drainage System Map Exhibit." A description of these subareas are as follows:

The existing westerly drainage subarea is approximately 0.90 acres and is 89% impervious with buildings, parking lot with carports, and landscaping. This westerly subarea has a vertical elevation difference of 10 feet as it slopes southwesterly to Argyle Avenue. With a horizontal distance of approximately 335 feet from high point to low point, the average slope of this existing subarea is 3%.

The existing easterly drainage subarea is approximately 0.26 acres and is 80% impervious with a parking lot, and two (2) single family dwelling units. This easterly subarea has a vertical elevation difference of approximately 8 feet as it slopes southeasterly to Vista Del Mar Avenue. With a horizontal distance of approximately 104 feet, the average slope of this existing subarea is 7%.

According to the 2006 LACDPW Hydrology Manual, the site lies in a 50-year, 24-hour Isohyet Rainfall Zone yielding 5.98 inches of rainfall above Altamont Clay Loam type soil (soil classification number 002). Per County criteria the 10-year, 24-hour Isohyet Rainfall is 4.27 inches.

Existing runoff calculations (provided in Appendix B.2) for the currently existing developed site subareas and result in the following:

Existing Subarea 1 – Draining to Argyle Ave:

10-year Storm Event Discharge (Q10) = 1.88 cubic feet per second (cfs)

50-year Storm Event Discharge (Q50) = 2.89 cfs

Existing Subarea 2 – Draining to Vista Del Mar Ave:

10-year Storm Event Discharge (Q10) = 0.58 cfs

50-year Storm Event Discharge (Q50) = 0.82 cfs

Discharge from both on-site drainage subareas drain to the southerly public storm drain system at the intersection of Argyle Ave. and Hollywood Blvd. as follows: The site's westerly subarea discharges to Argyle Ave., flows southerly along Argyle Ave., then enters the existing storm drain system with 24" pipe at the intersection of Argyle Ave. and Hollywood Blvd. The site's easterly subarea discharges to Vista Del Mar Ave., then flows southerly to a catch basin at the intersection of Carlos Ave. This catch basin drains westerly to Argyle Ave. via a storm drain recently built under plan D-33819. That same storm drain then turns southerly at Argyle Ave. and connects to the 24" pipe at the intersection of Argyle Ave. and Hollywood Blvd. This storm drain system connects to a 90" drain in Sunset Blvd, and ultimately discharges in to the Wilshire Country Club flood channel by way of Vine Street.

Additionally, the site is not located within a 100-year floodplain. According to the FEMA Flood Insurance Rate Map (FIRM) Panel Number 06037C1605F, the site is located within “Zone X” – Moderate/Minimal Risk Area (see map in Appendix A.2). The nearest special flood hazard areas (FEMA Zone A) are the Hollywood Reservoir approximately 1 mile to the north, and the Hollywood Forever Cemetery approximately 1 mile to the south.

1.c Proposed Conditions & Project Impacts

The project will require demolition of the existing structures on-site. The proposed development described above consists of podium-type buildings with approximately 3,210 square feet landscaping/pervious areas at-grade resulting in approximately 94% imperviousness for the site. Slopes of the on-site drainage facilities shall meet the minimums per building code. Drainage of the proposed development shall be split into two (2) subareas in order to maintain drainage patterns that mimic the existing drainage patterns, as follows:

The proposed westerly drainage subarea shall be approximately 0.90 acres with high-rise type buildings containing roof decks. The building roof decks with landscaping throughout and will have potential to incorporate a “green roof” and/or roof garden type designs. This westerly subarea is considered to be 100% impervious with a maximum flow path of 390 feet in length at 2% slope.

The proposed easterly drainage subarea shall be approximately 0.26 acres with the detached 4-story multi-residential structure and pervious areas at-grade. This easterly subarea is considered to be approximately 73% impervious with a maximum flow path of 200' in length at 2% slope.

Per the results of the proposed runoff calculations provided in Appendix B.3, the proposed site drainage subareas will discharge as follows:

Proposed Subarea 1 – Draining to Argyle Ave:

10-year Storm Event Discharge (Q10) = 1.76 cubic feet per second (cfs)

50-year Storm Event Discharge (Q50) = 2.89 cfs

Proposed Subarea 2 – Draining to Vista Del Mar Ave:

10-year Storm Event Discharge (Q10) = 0.58 cfs

50-year Storm Event Discharge (Q50) = 0.82 cfs

The proposed development shall result in site conditions that are similar to the existing conditions. Proposed drainage subareas shall mimic existing subareas and will discharge following the same patterns described at the end of Section 1.b above. Per calculations in Appendix B, the total site shall have an effective change in Q10 runoff of -0.12 cfs, and effective change in Q50 runoff of 0 cfs. Since the project site is located at the most upstream portion of the local watershed, there are no upstream areas draining

towards the site that could adversely impact the project. Also, since the proposed development effectively does not increase runoff flows, it will not have an adverse effect on any downstream drainage facilities.

1.d Recommended Mitigation Measures

Proposed conditions to the project site closely match those of the existing conditions and therefore will not significantly alter existing drainage patterns. It is recommended that the project comply with all governing hydrology design criteria and proper storm drainage construction practices as the method to mitigate runoff flows generated from the site.

PART 2 – SURFACE WATER QUALITY

2.a Regulatory Framework

The proposed project is subject to local water quality ordinances, which have been implemented based on the following legal statues:

- Federal Clean Water Act order of the National Pollutant Discharge Elimination System (NPDES)
- California Water Code, Division 7 - Water Quality (Porter-Cologne Act) establishing the State Water Resources Control Board (SWRCB)
- Los Angeles Regional Water Quality Control Board (RWQCB) administering Order No. R4-2012-0175 (NPDES Permit No. CAS004001) – Waste Discharge Requirements for Municipal Separate Storm Sewer System Discharges (commonly known as the MS4 Permit).

On November 14, 2011 the City of Los Angeles adopted the Stormwater Low Impact Development (LID) Ordinance No. 181899 to meet the MS4 Permit. Operational water quality design criteria is outlined in the City's Development Best Management Practices Handbook – Part B Planning Activities (LID Manual).

Construction activities associated with the project are subject to provisions outlined in City Ordinances No. 173494 and 172673, and implemented through the City's Development Best Management Practices Handbook – Part A Construction Activities. For project areas that disturb over one (1) acre of land, project construction must also obtain state coverage by developing and implementing a Storm Water Pollution Prevention Program (SWPPP) per the California Construction General Permit (CGP), Order No. 2012-0006-DWQ, NDPES No. CAS000002. Requirements per the CGP include submittal to the State Water Resources Control Board (SWRCB) a Notice of Intent (NOI), required fees, and proper inspection and observation of implemented construction BMPs.

2.b Existing Conditions

Site drainage is tributary to the Ballona Creek Waterbody, which is listed by the US Environmental Protection Agency (EPA) as a 303(d) Impaired Water Body – Category 5 (a water segment where standards are not met and a total maximum daily load of pollutants is required but not yet completed). Details of the Ballona Creek pollutants can be found in Appendix A.4.

The quality of the on-site surface water runoff may be currently contaminated by pollutants generated from existing roof and parking lot surfaces. Potential pollutants of roof runoff include air pollution deposits, roof material debris, and any leakage from

mechanical units. Potential pollutants of parking lot runoff include air pollution deposits, oils from vehicles, degraded pavement material, and trash. No stormwater runoff treatment devices currently exist on-site. There are no current waste load allocations identified on-site.

2.c Proposed Conditions & Project Impacts

CONSTRUCTION

Given that the proposed development construction will disturb more than one (1) acre of soil, the project requires the preparation of a state mandated Stormwater Pollution Prevention Plan (SWPPP), which addresses stormwater pollution, erosion potential, and sedimentation due to construction activities. Requirements and guidelines are listed in the City's Development Best Management Practices Handbook Part A – Construction Activities. Recommended control BMPs for construction include:

- Silt fences, sediment traps/basins, check dams, barriers, and storm drain inlet protection providing sediment control
- Stabilized wind erosion control and entrance/exit tracking control of vehicles

Construction BMPs per required standards shall prevent discharge of pollutants from construction site. If properly implemented, construction activities on-site pose little to no significant impacts on surface water quality, erosion potential, and sedimentation.

OPERATION / POST-CONSTRUCTION

Classified as a large-scale development per the City's Watershed Protection Division, the development must provide a long-term operational BMP design to treat a required quantity of stormwater runoff on-site. This shall be achieved by adhering to design criteria outlined in the City's LID Manual. Per the regional MS4 Permit, the project must include one of the following BMPs to treat a "first flush" volume of runoff equal to the greater of an 85th Percentile 24-hour or 0.75-inch rainfall event (in priority order to the maximum extent feasible):

- Infiltration basins or trenches
- Rainwater harvesting cisterns for irrigation reuse
- Biofiltration via planter boxes, basins, or proprietary treatment devices

Assessment of feasible BMP solutions require a site-specific soils investigation as well as approved calculations justifying BMP sizing and treatment capabilities. Proposed BMP designs shall comply with the City's Best Management Practices Handbook Part B – Planning Activities (Low Impact Development Manual).

Potential to evaluate the feasibility to infiltrate the "first flush" runoff requires a site-specific geotechnical investigation. Requirements for infiltration BMPs include suitable distances from buildings, slopes, property lines, and seasonal high groundwater levels; and suitable soils with high permeability rates that are not subject to hazards such as

liquefaction or expansion. As the project site is designated as a “Hillside Grading Area” it is likely that infiltration is not a feasible LID solution.

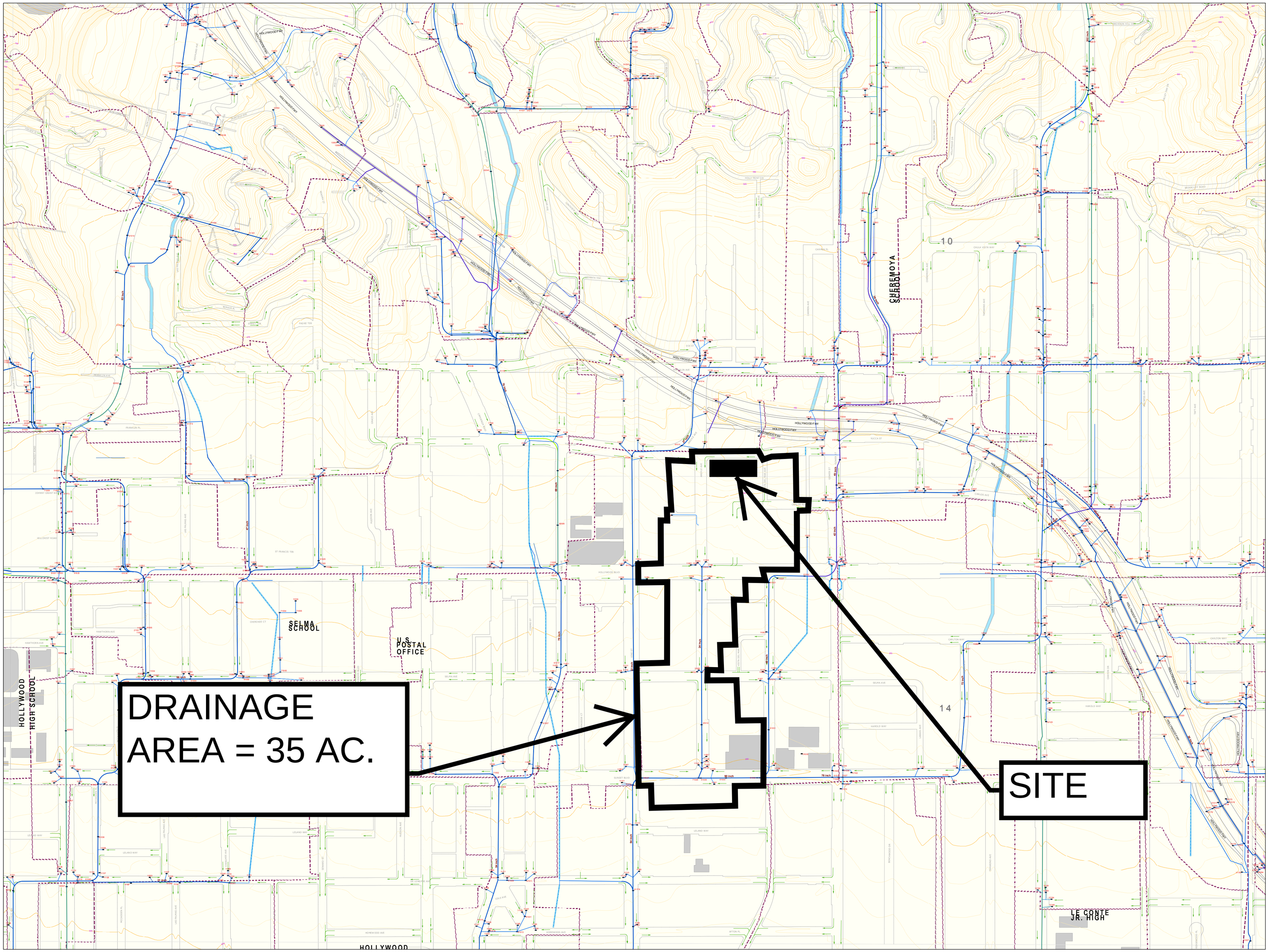
Potential to harvest runoff for irrigation reuse shall require coordination with the project landscape architect. Proposed landscaping shall require enough water demand to use the captured runoff volume over a certain period of time. As the project is likely subject to the City’s Xeriscape Ordinance requiring low-water use planting, enough planting area will need to be provided to yield a sufficient total water demand volume that is greater than or equal to the captured runoff volume. A proposed capture and use LID solution will require a water demand analysis by a landscape architect, and may be subject to approval by the Los Angeles County Department of Public Health.

Should biofiltration planters be proposed, they will require to be sized with a total proportional treatment area approximately 7% of each impervious tributary drainage subarea based on preliminary calculations. Biofiltration planter LID solutions appear to be viable for the project, and potential BMP locations can be found in Appendix A.5. Additionally, as the project proposes separate roof decks, “green roof” and/or roof garden designs may be considered as an LID solution and may require coordination with the project’s architect and structural engineer.

As LID designs are required to be incorporated into the proposed development, their implementation shall create proposed conditions that pose no significant impacts on surface water quality.

2.d Recommended Mitigation Measures

Implementation of BMPs are considered sufficient to mitigate any negative impacts to surface water quality. Analysis will be required at final engineering to determine the feasibility of infiltration, capture and use, and biofiltration in that order of priority and will require consultation with a soils engineer, landscape architect, and civil engineer.



Landbase data is from the City of Los Angeles Survey and Mapping Division.
Contours are derived from USGS digital elevation models.
Drainage features are digitized from Stormwater Management drainage maps.
Coordinate system is hsown in California State Plane, NAD83, Zone 5 (feet).
Cultural features are from Thomas Brothers maps digital data.

Drainage feature revised date: July 2014
Landbase revised date: June 2014
Contour revised date: June 2004
Date Plotted: 9/8/2014

LA DPW ENGINEERING
Serving the Present; Designing the Future

Drainage Map No. 469
Quadrant No. 3

Feet
500 250 0 500 1,000

Inlet
Flow Direction
Relief Sewer
Abandoned Pipe
Miscellaneous Pipe

Contours Elevation Level by:
25 Ft. interval
Others

Buildings and Cultural Features
Coast / Stormwater Channel
City of Los Angeles
Subarea
Railroad
Jetty
Los Angeles City Limit

Stormwater Pipe Ownership
City of Los Angeles
County of Los Angeles
State of California
Others

Tile Index
N

Primary Office: CENTRAL

A.1

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1994 or later and from National Geospatial Intelligence Agency imagery produced at a scale of 1:4,000 from photography dated 2003 or later.

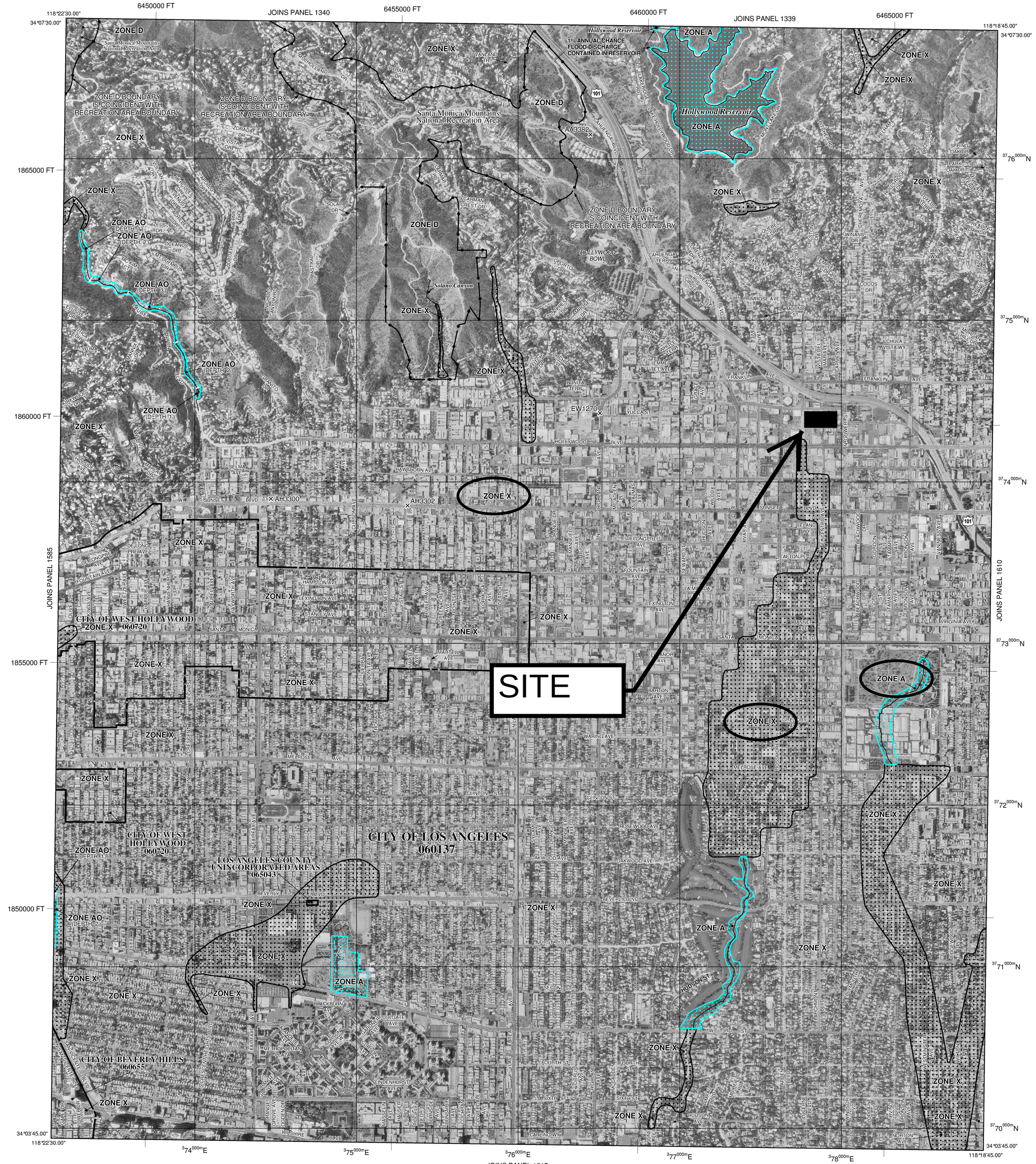
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A	Cross section line
23 - - - - - 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
$^{42}75^{000m}$N	1000-meter Universal Transverse Mercator grid values, zone 11
6000000 FT	5000-foot grid ticks: California State Plane coordinate system, V zone (FIPSZONE 0405), Lambert Conformal Conic
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
September 26, 2008
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1605F

FIRM
FLOOD INSURANCE RATE MAP
LOS ANGELES COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 1605 OF 2350
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LOS ANGELES COUNTY	065043	1605	F
BEVERLY HILLS, CITY OF	060655	1605	F
LOS ANGELES, CITY OF	060137	1605	F
WEST HOLLYWOOD, CITY OF	060720	1605	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06037C1605F

EFFECTIVE DATE
SE

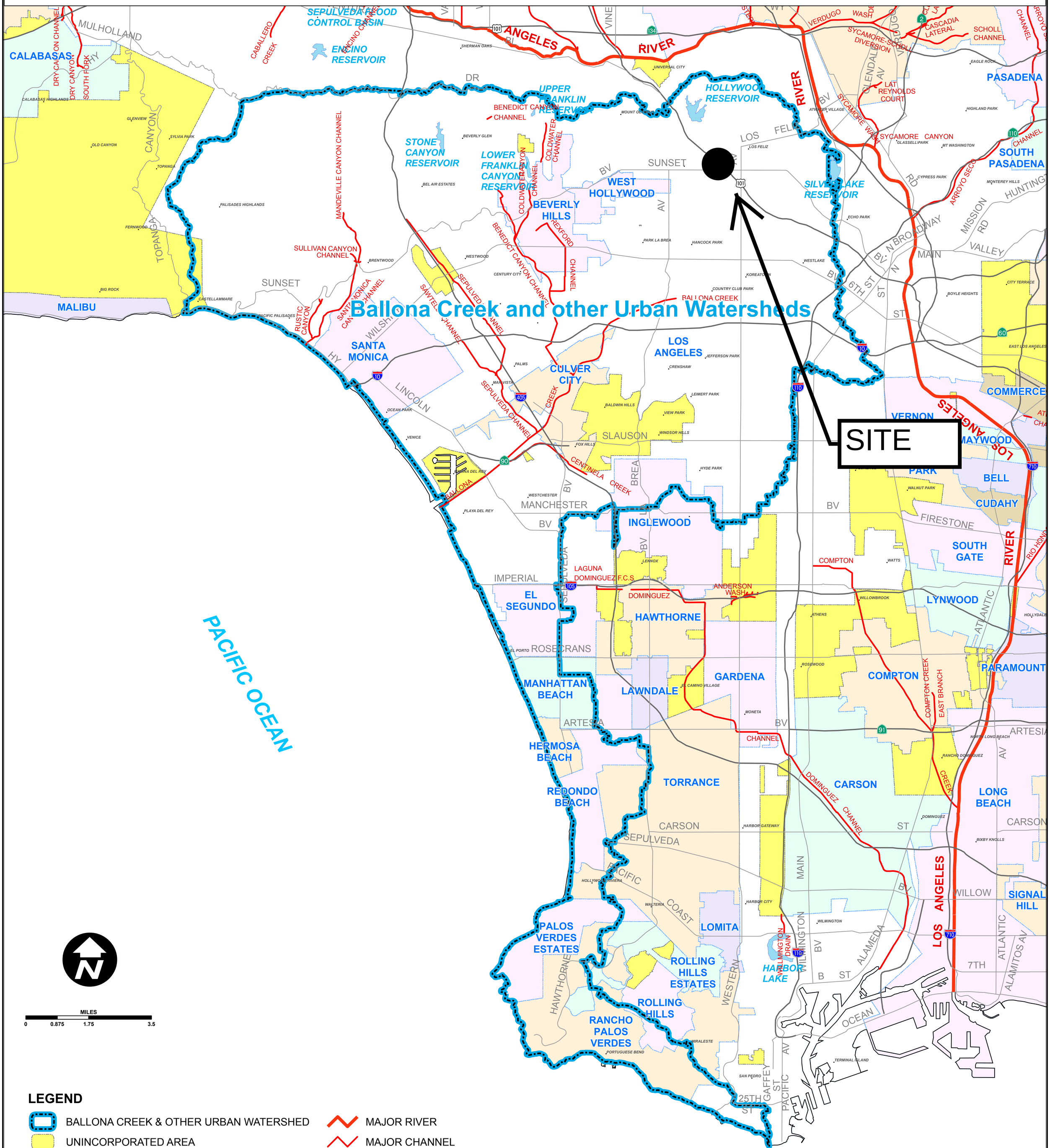
Federal Emergency M

A.2

A.3

COUNTY OF LOS ANGELES

BALLONA CREEK & OTHER URBAN WATERSHEDS



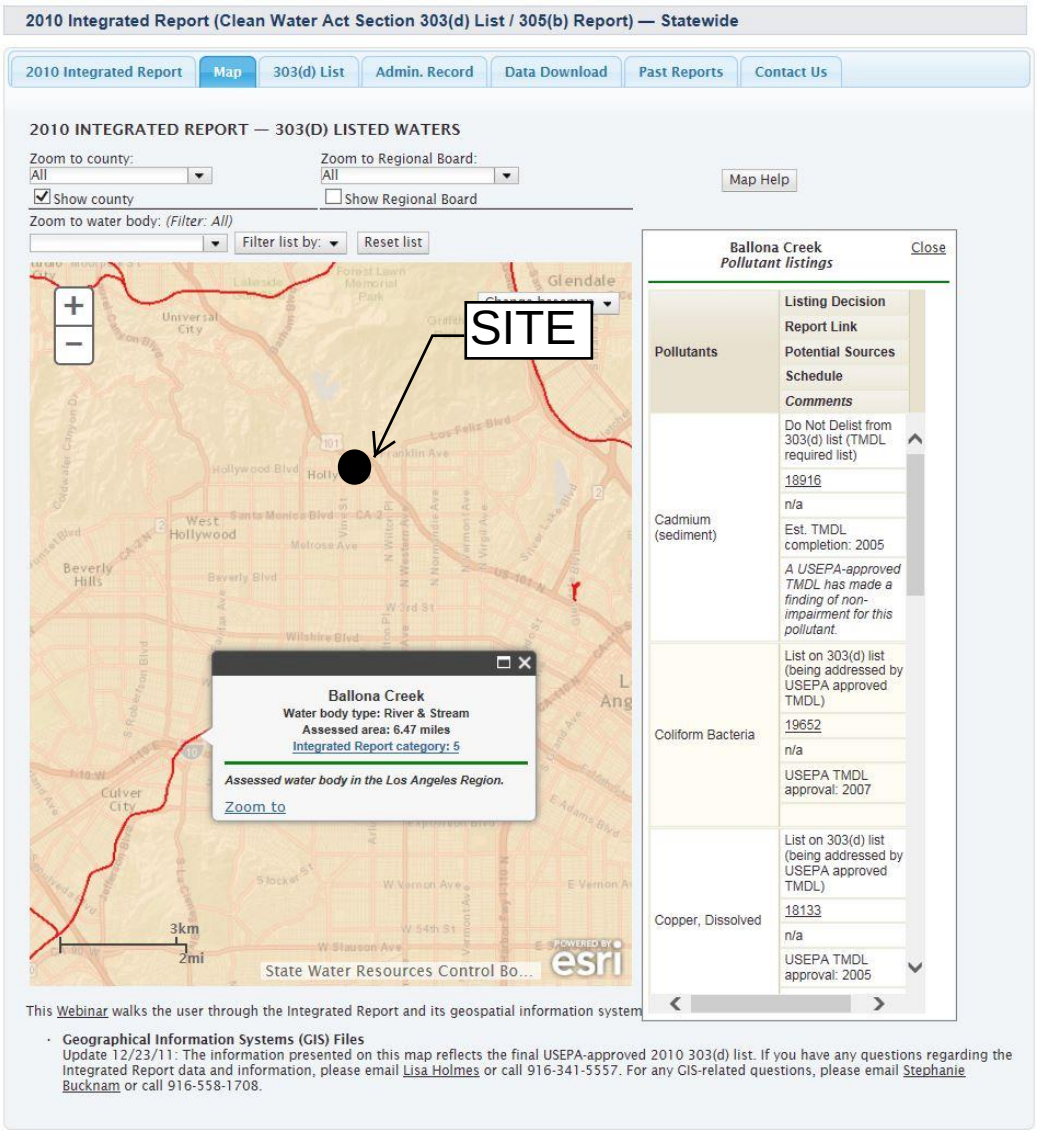
LEGEND

- BALLONA CREEK & OTHER URBAN WATERSHED
- UNINCORPORATED AREA
- DAM / LAKE / RESERVOIR
- MAJOR RIVER
- MAJOR CHANNEL

Data contained in this map is produced in whole or part from the Los Angeles County Department of Public Works' digital database.

REF: \\pwgisd02\mpmgis$\MPMGIS\projects\mpm\gismaps\wk_2627\ballonacreeketc_wtrsheds.mxd DATE: 08/22/07

Mapping & Property Management Division, Mapping & GIS Services Section



Statewide
USEPA Final Approval: October 11, 2011

CATEGORY 5

Final 2010 Integrated Report (CWA Section 303(d) List / 305(b) Report)

2010 CALIFORNIA 303(d) LIST OF WATER QUALITY LIMITED SEGMENTS*

Category 5 criteria: 1) A water segment where standards are not met and a TMDL is required, but not yet completed, for at least one of the pollutants being listed for this segment.

* USGS HUC = US Geological Survey Hydrologic Unit Code. Calwater = State Water Resources Control Board hydrological subunit area or even smaller planning watershed.

** TMDL requirement status definitions for listed pollutants are: A= TMDL still required, B= being addressed by USEPA approved TMDL, C= being addressed by action other than a TMDL

*** Dates relate to the TMDL requirement status, so a date for A= TMDL scheduled completion date, B= Date USEPA approved TMDL, and C= Completion date for action other than a TMDL

REGION	WATER BODY NAME	WATER TYPE	WATERSHED* CALWATER / USGS HUC	• POLLUTANT ◦ POTENTIAL SOURCES *Relevant Notes*	ESTIMATED AREA ASSESSED	FIRST YEAR LISTED	TMDL REQUIREMENT STATUS**	DATE***
4	Ballona Creek	River & Stream	40513000 / 18070104	• Cadmium (sediment) ◦ Nonpoint Source ◦ Point Source	6.5 Miles	1996	5A	2005
				A USEPA-approved TMDL has made a finding of non-impairment for this pollutant.				
				• Coliform Bacteria ◦ Nonpoint Source ◦ Point Source	6.5 Miles	2002	5B	2007
				• Copper, Dissolved ◦ Nonpoint Source	6.5 Miles	2006	5B	2005
				• Cyanide ◦ Source Unknown	6.5 Miles	1996	5A	2019
				• Lead ◦ Source Unknown	6.5 Miles	2002	5B	2005
				• Selenium ◦ Source Unknown	6.5 Miles	2006	5B	2005
				• Toxicity ◦ Source Unknown	6.5 Miles	1996	5B	2005
				• Trash ◦ Source Unknown	6.5 Miles	1996	5B	2001
				• Viruses (enteric) ◦ Nonpoint Source ◦ Point Source	6.5 Miles	1996	5B	2007
				• Zinc ◦ Source Unknown	6.5 Miles	1996	5B	2005

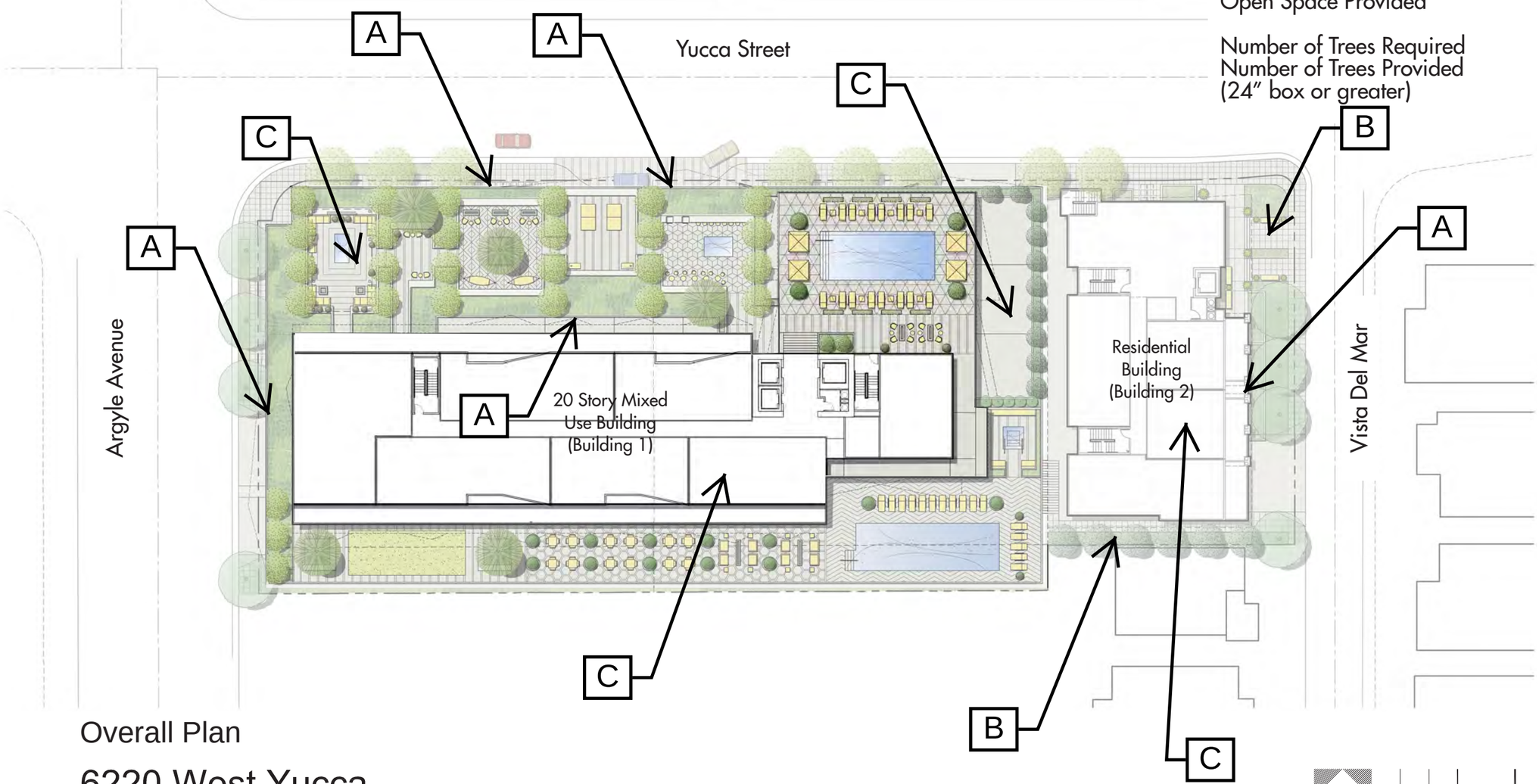
SOURCE: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml

A POTENTIAL LID PLANTER/BIOFILTRATION

B POTENTIAL PERMEABLE PAVEMENT APPLICATION

C POTENTIAL "GREEN ROOF" DESIGN

Open Space Summary	Building 1	Building 2
Open Space Required	22,650 SF	1,500 SF
Common Open Space (Indoor)	-	375 SF
Common Open Space (Hardscape)	9,500 SF	500 SF
Common Open Space (Landscape)	4,850 SF	375 SF
Private Open Space	8,500 SF	250 SF
Open Space Provided	22,850 SF	1,500 SF
Number of Trees Required	50	4
Number of Trees Provided (24" box or greater)	54	8



Overall Plan

6220 West Yucca

6220 West Yucca Street, Los Angeles, California 90028

APN 5546-031-007, 5546-031-008, 5546-031-027, 5546-031-031

Champion Real Estate Company

(COURTESY OF TOGAWA SMITH MARTIN, INC. & EPT DESIGN)

June 9, 2017

L1

ARCHITECTS
TOGAWA SMITH MARTIN
INCORPORATED
444 S Flower Street - Suite 1220
Los Angeles, California 90071
213.614.6050
213.614.6051 fax
www.tsminc.com
EPTDESIGN

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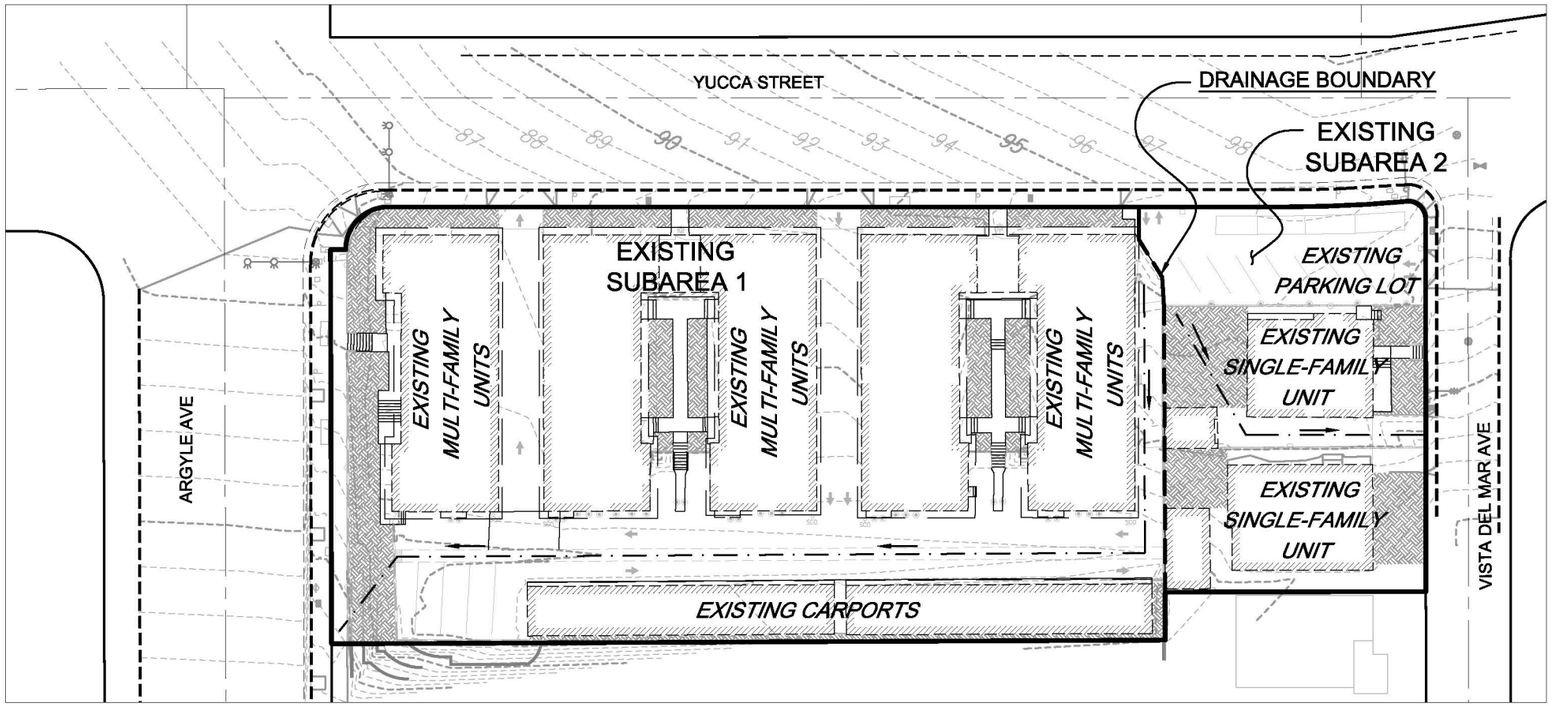
EXISTING/PRE-DEVELOPMENT DRAINAGE

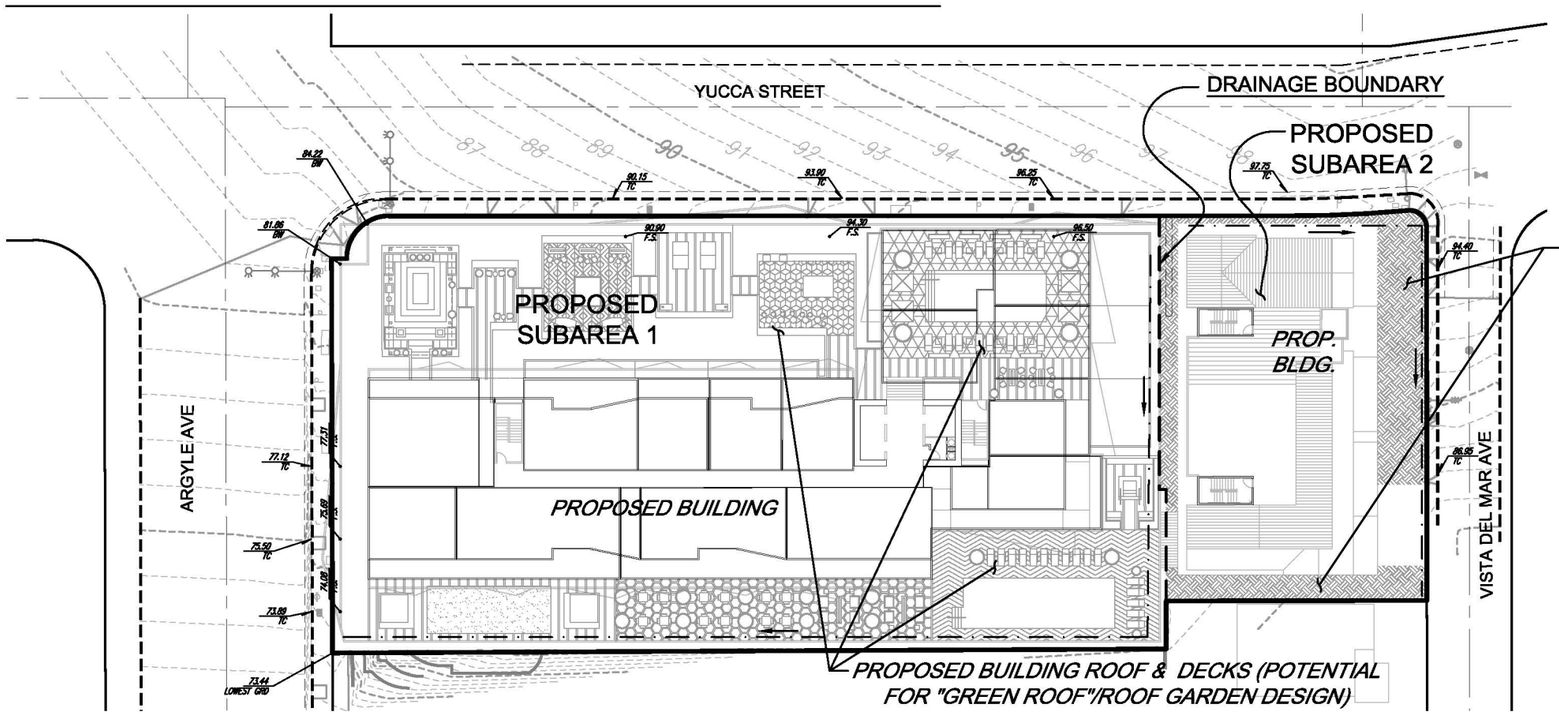


LEGEND

- HYDROLOGIC FLOW PATH
- DRAINAGE SUBAREA BOUNDARY
- PERVIOUS/LANDSCAPE AREA

PRE-DEVELOPMENT TOTALS:	POST-DEVELOPMENT TOTALS:
A_TOTAL = 50,323 SF = 1.16 AC A_PERV = 6,580 SF = 0.15 AC IMP = 87%	A_TOTAL = 50,323 SF = 1.16 AC A_PERV = 2,990 SF = 0.07 AC IMP = 94%
PRE-DEVELOPMENT SUBAREAS:	POST-DEVELOPMENT SUBAREAS:
1 - ARGYLE A_SUB = 39,201 SF A_PERV = 4,375 SF IMP = 1-(4375/39201) = 89% S = (95-85)/335 = 0.03 FT/FT Q_10 = 1.88 cfs Q_50 = 2.89 cfs	1 - ARGYLE A_SUB = 39,180 SF A_PERV = 0 SF IMP = 100% S = 2%, L = 390' Q_10 = 1.76 cfs Q_50 = 2.89 cfs
2 - VISTA DEL MAR A_SUB = 11,122 SF A_PERV = 2,205 SF IMP = 1-(2205/11122) = 80% S = (97-89)/104 = 0.077 FT/FT Q_10 = 0.58 cfs Q_50 = 0.82 cfs	2 - VISTA DEL MAR A_SUB = 11,143 SF A_PERV = 2,990 SF IMP = 1-(2990/11143) = 73% S = 2%, L = 200' Q_10 = 0.58 cfs Q_50 = 0.82 cfs

PROPOSED/POST-DEVELOPMENT DRAINAGE



OUTSIDE BUILDING TO BE LANDSCAPE PLUS PERMEABLE WALKS/DECKS OR COMBINATION THEREOF

25 0 25 50

GRAPHIC SCALE
SCALE : 1"=50'

'6220 WEST YUCCA'

EXISTING & PROPOSED DRAINAGE SYSTEM MAP

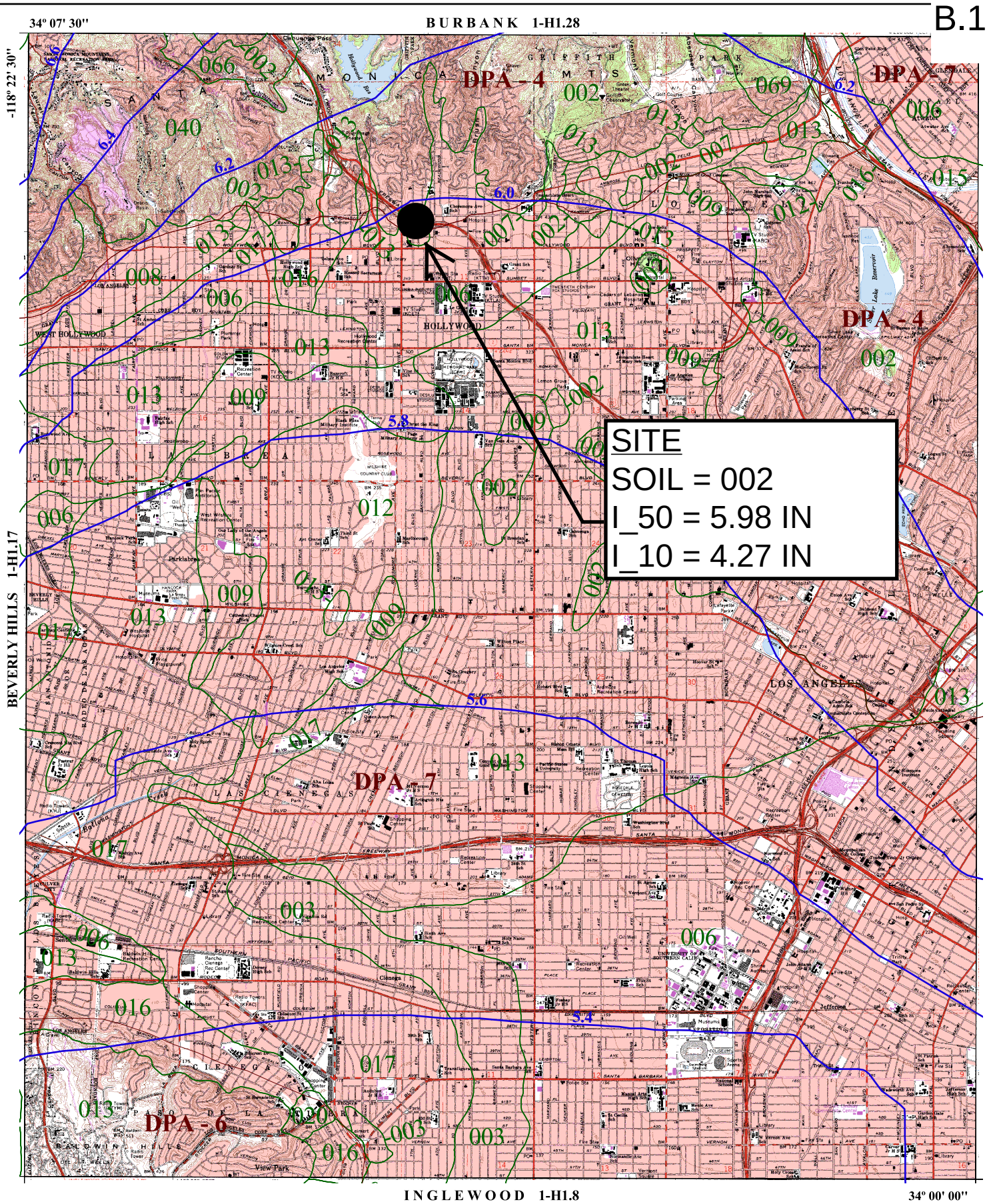
PREPARED BY:
Southland Civil Engineering & Survey, LLP
87 N. Raymond Ave., Ste 300
Pasadena, CA 91103
Office: 626-486-2555
Fax: 626-486-2553

DRAWN BY HLG
CHECKED BY SHL
DESIGNED BY SHL

R.C.E. No. 70304, Stephen H. Lewis Date

Proj. No. 780-15020
Sheet 1 of 1

J:\780-15020\EXHIBIT\Drainage Map Exhibit.dwg Jul 07, 2017 11:38 am EWANG



N
W E
S

016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

HOLLYWOOD
50-YEAR 24-HOUR ISOHYET

1-H1.18

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

Soil Identification Table

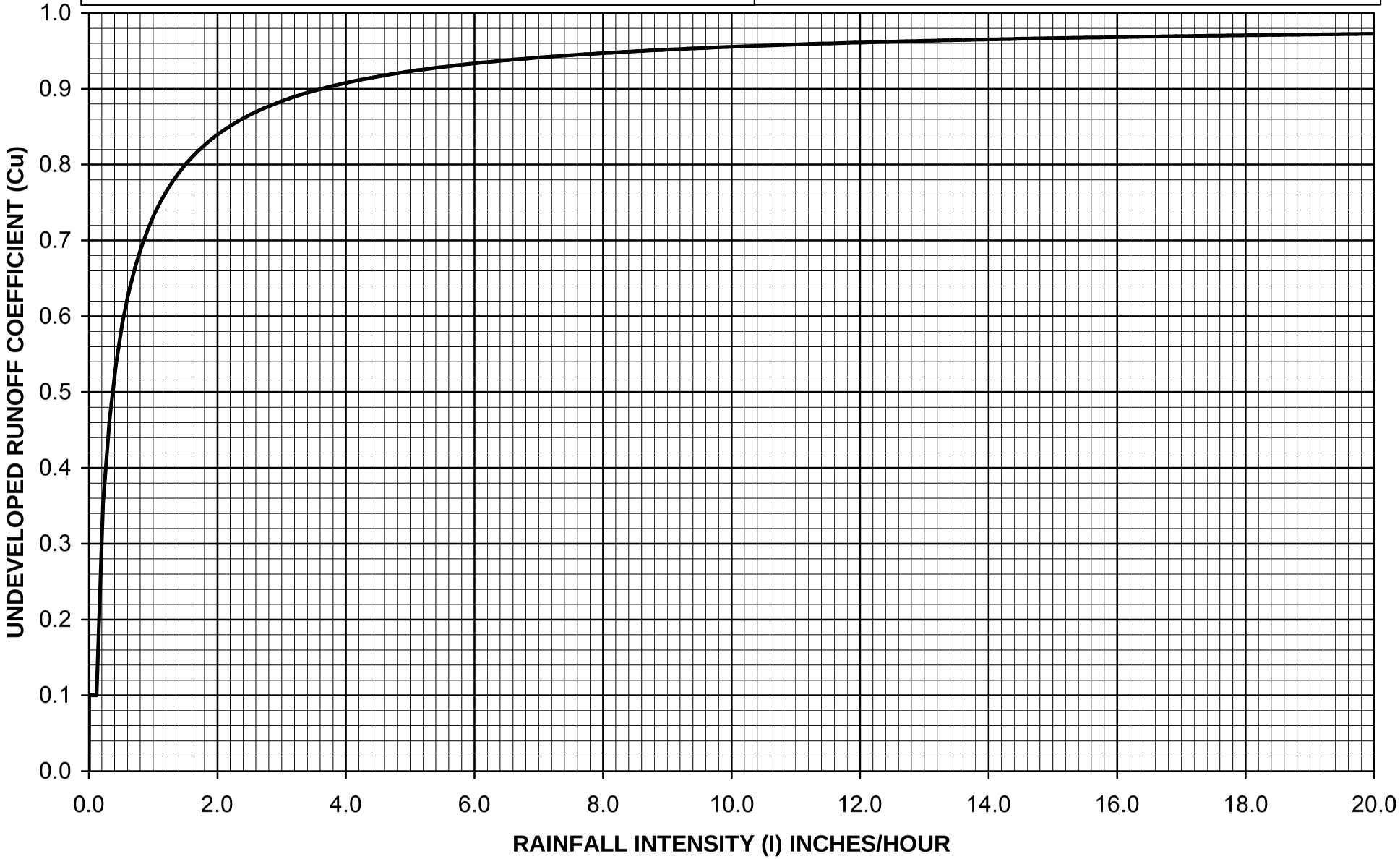
Number	Name	Original Name
2	ALTAMONT CLAY LOAM	A
3	CHINO SILT LOAM	CS-1
4	DIABLO CLAY LOAM	DY
5	HANFORD FINE SANDY LOAM	HF
6	HANFORD FINE SANDY LOAM	HF-1
7	HANFORD GRAVELLY SANDY LOAM	HG
8	HANFORD SILT LOAM	HN
9	MONTEZUMA CLAY ADOBE	M
10	OAKLEY FINE SAND	OS
11	PLACENTIA LOAM	PL
12	RAMONA CLAY LOAM	RC- 1
13	RAMONA LOAM	RO
14	RAMONA SANDY LOAM	RS
15	TUJUNGA FINE SANDY LOAM	TF
16	YOLO LOAM	Y
17	YOLO CLAY LOAM	YC
18	YOLO FINE SANDY LOAM	YF
19	YOLO GRAVELLY SANDY LOAM	YG
20	YOLO SANDY LOAM	YS
21	SANTA MONICA MOUNTAINS	SMM-1
22	SANTA MONICA MOUNTAINS	SMM-2
23	SANTA MONICA MOUNTAINS	SMM-3
24	SANTA MONICA MOUNTAINS	SMM-4
25	SANTA MONICA MOUNTAINS	SMM-5
26	SANTA MONICA MOUNTAINS	SMM-6
27	SANTA MONICA MOUNTAINS	SMM-7
28	SANTA MONICA MOUNTAINS	SMM-8
29	SANTA MONICA MOUNTAINS	SMM-9
30	SANTA MONICA MOUNTAINS	SMM-10
31	SANTA MONICA MOUNTAINS	SMM- 11
32	SANTA MONICA MOUNTAINS	SMM-12
33	SANTA MONICA MOUNTAINS	SMM-13
34	SANTA MONICA MOUNTAINS	SMM-14
35	SANTA MONICA MOUNTAINS	SMM-15
36	SANTA MONICA MOUNTAINS	SMM-16
37	SANTA MONICA MOUNTAINS	SMM- 17
38	SANTA MONICA MOUNTAINS	SMM- 18

$C_D = (0.9 * IMP) + (1.0 - IMP) * C_U$

Where: C_D = Developed Runoff Coefficient
IMP = Proportion Impervious
C_U = Undeveloped runoff coefficient

Los Angeles County Department of Public Works

RUNOFF COEFFICIENT CURVE
SOIL TYPE NO. 002



Peak Flow Hydrologic Analysis

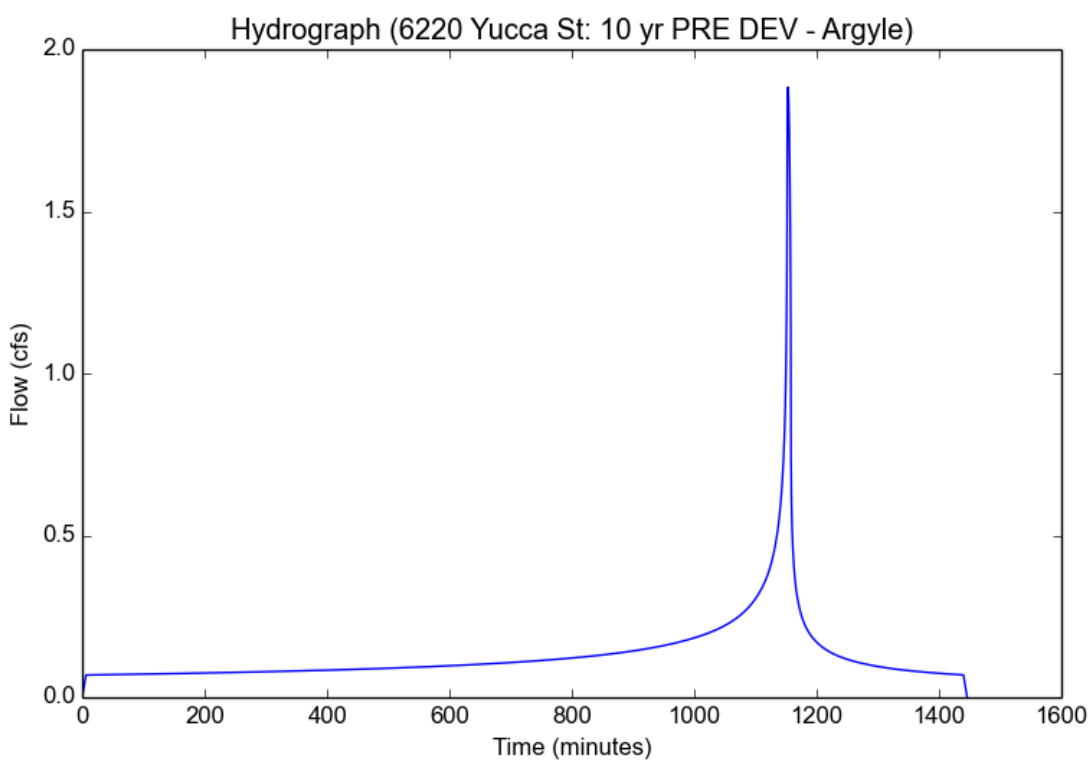
File location: P:/78015020/PLANNING/Drainage Study/Hydro Calcs/6220 Yucca St - 10 yr PRE DEV - Argyle.pdf
Version: HydroCalc 0.2.0-beta

Input Parameters

Project Name	6220 Yucca St
Subarea ID	10 yr PRE DEV - Argyle
Area (ac)	0.8999
Flow Path Length (ft)	335.0
Flow Path Slope (vft/hft)	0.03
50-yr Rainfall Depth (in)	5.98
Percent Impervious	0.89
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.2697
Peak Intensity (in/hr)	2.3382
Undeveloped Runoff Coefficient (Cu)	0.8544
Developed Runoff Coefficient (Cd)	0.895
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	1.8832
Burned Peak Flow Rate (cfs)	1.8832
24-Hr Clear Runoff Volume (ac-ft)	0.2652
24-Hr Clear Runoff Volume (cu-ft)	11553.2115



Peak Flow Hydrologic Analysis

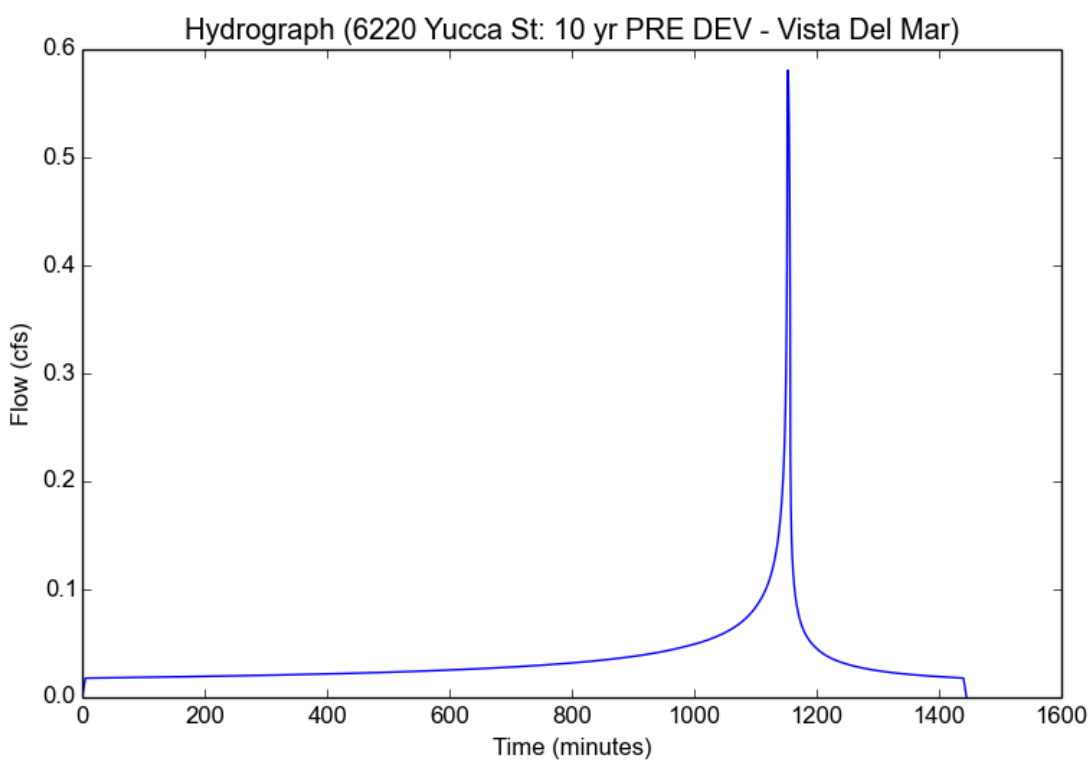
File location: P:/78015020/PLANNING/Drainage Study/Hydro Calcs/6220 Yucca St - 10 yr PRE DEV - Vista Del Mar.pdf
Version: HydroCalc 0.2.0-beta

Input Parameters

Project Name	6220 Yucca St
Subarea ID	10 yr PRE DEV - Vista Del Mar
Area (ac)	0.2553
Flow Path Length (ft)	105.0
Flow Path Slope (vft/hft)	0.07
50-yr Rainfall Depth (in)	5.98
Percent Impervious	0.8
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.2697
Peak Intensity (in/hr)	2.5474
Undeveloped Runoff Coefficient (Cu)	0.8637
Developed Runoff Coefficient (Cd)	0.8927
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.5806
Burned Peak Flow Rate (cfs)	0.5806
24-Hr Clear Runoff Volume (ac-ft)	0.0705
24-Hr Clear Runoff Volume (cu-ft)	3069.7255



Peak Flow Hydrologic Analysis

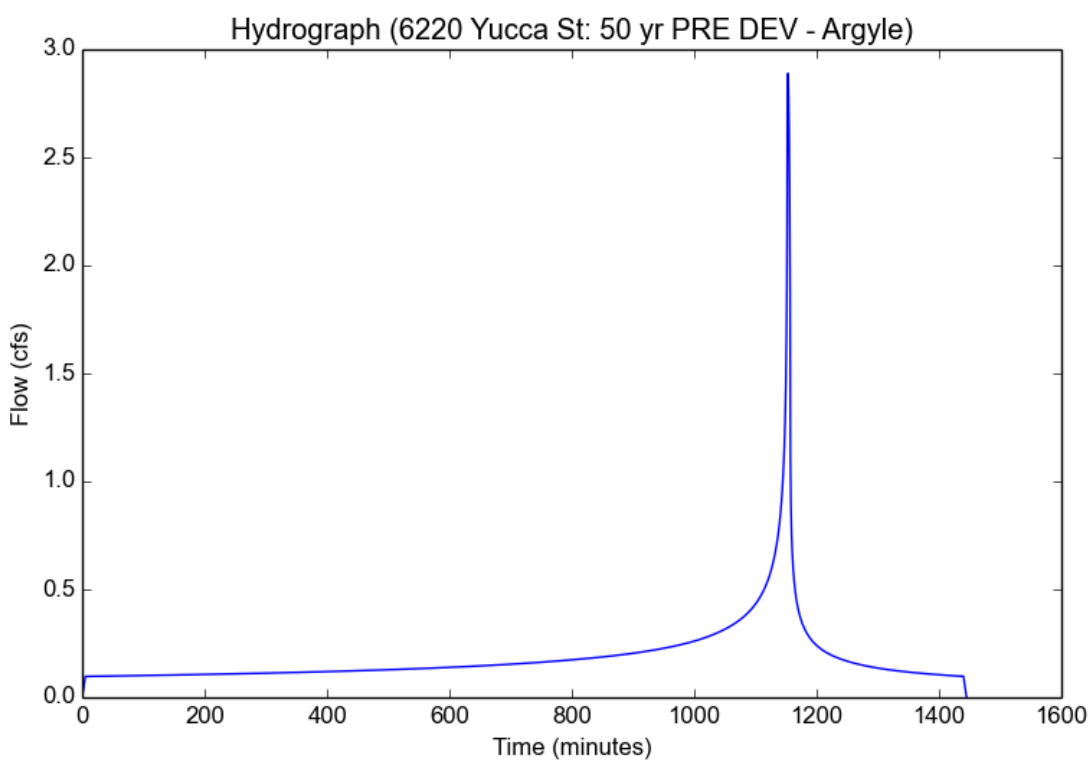
File location: P:/78015020/PLANNING/Drainage Study/Hydro Calcs/6220 Yucca St - 50 yr PRE DEV - Argyle.pdf
Version: HydroCalc 0.2.0-beta

Input Parameters

Project Name	6220 Yucca St
Subarea ID	50 yr PRE DEV - Argyle
Area (ac)	0.8999
Flow Path Length (ft)	335.0
Flow Path Slope (vft/hft)	0.03
50-yr Rainfall Depth (in)	5.98
Percent Impervious	0.89
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.8974
Developed Runoff Coefficient (Cd)	0.8997
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.8887
Burned Peak Flow Rate (cfs)	2.8887
24-Hr Clear Runoff Volume (ac-ft)	0.3762
24-Hr Clear Runoff Volume (cu-ft)	16386.5823



Peak Flow Hydrologic Analysis

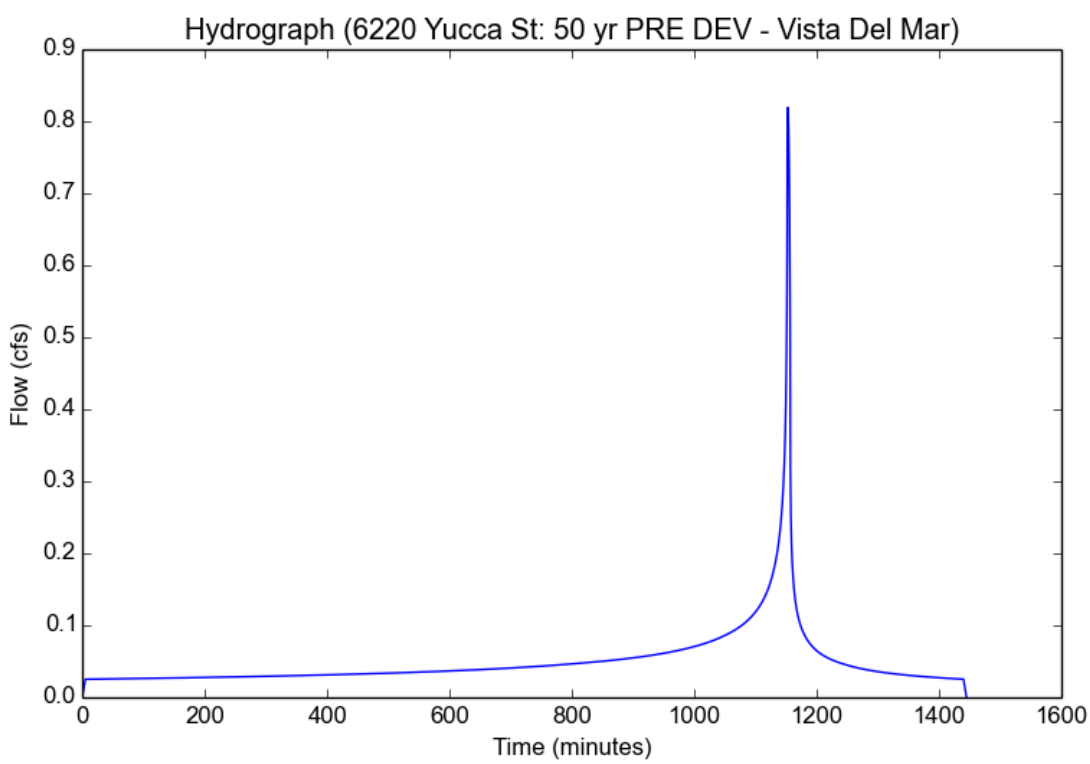
File location: P:/78015020/PLANNING/Drainage Study/Hydro Calcs/6220 Yucca St - 50 yr PRE DEV - Vista Del Mar.pdf
Version: HydroCalc 0.2.0-beta

Input Parameters

Project Name	6220 Yucca St
Subarea ID	50 yr PRE DEV - Vista Del Mar
Area (ac)	0.2553
Flow Path Length (ft)	105.0
Flow Path Slope (vft/hft)	0.07
50-yr Rainfall Depth (in)	5.98
Percent Impervious	0.8
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.8974
Developed Runoff Coefficient (Cd)	0.8995
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.8193
Burned Peak Flow Rate (cfs)	0.8193
24-Hr Clear Runoff Volume (ac-ft)	0.1011
24-Hr Clear Runoff Volume (cu-ft)	4405.3148



Peak Flow Hydrologic Analysis

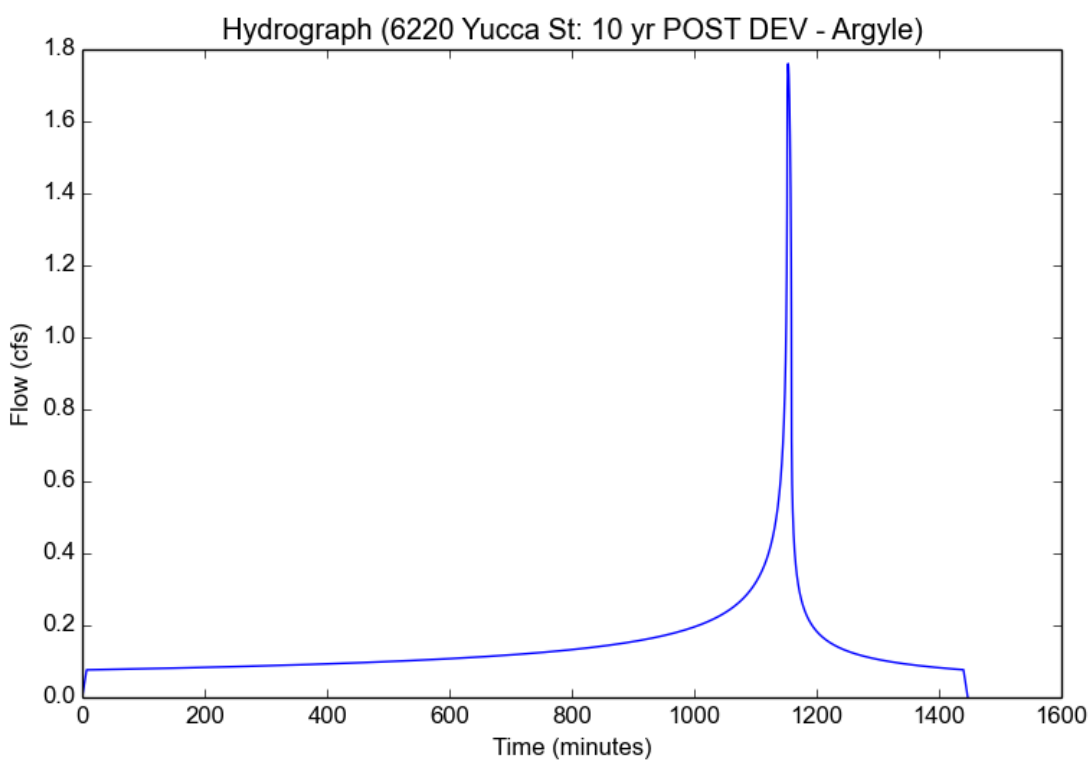
File location: P:/78015020/PLANNING/Drainage Study/Hydro Calcs/6220 Yucca St - 10 yr POST DEV - Argyle.pdf
Version: HydroCalc 0.2.0-beta

Input Parameters

Project Name	6220 Yucca St
Subarea ID	10 yr POST DEV - Argyle
Area (ac)	0.8994
Flow Path Length (ft)	390.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	5.98
Percent Impervious	1.0
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.2697
Peak Intensity (in/hr)	2.1748
Undeveloped Runoff Coefficient (Cu)	0.8472
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	1.7604
Burned Peak Flow Rate (cfs)	1.7604
24-Hr Clear Runoff Volume (ac-ft)	0.2856
24-Hr Clear Runoff Volume (cu-ft)	12442.2108



Peak Flow Hydrologic Analysis

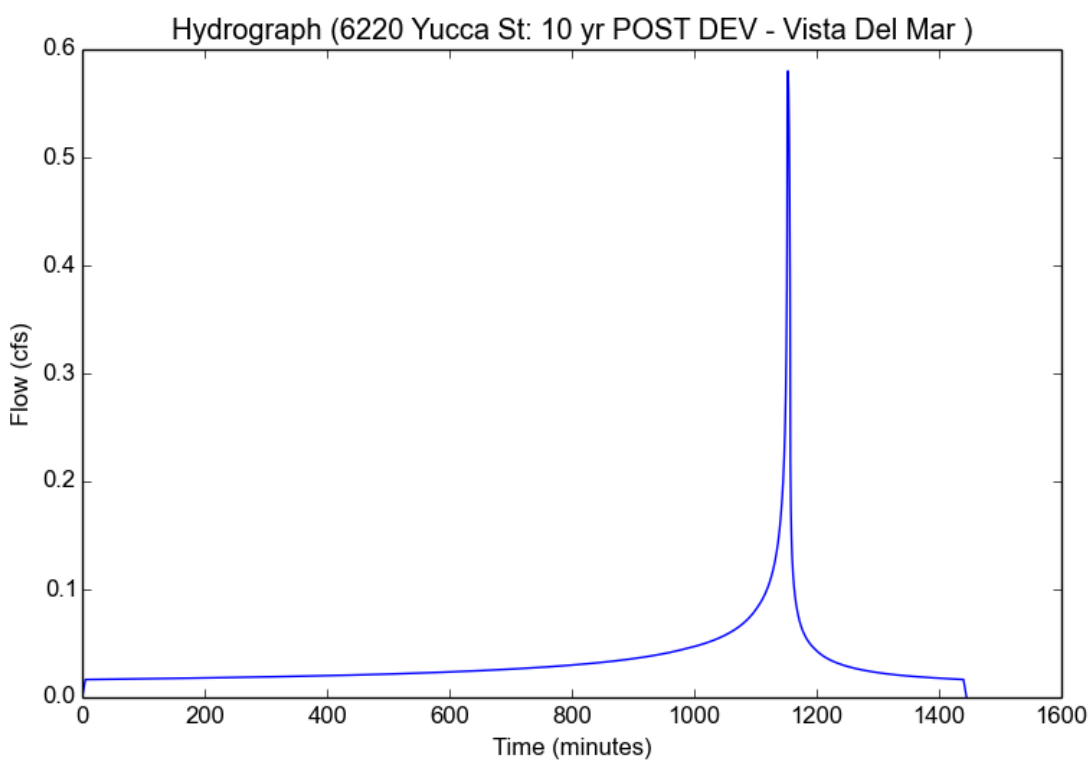
File location: P:/78015020/PLANNING/Drainage Study/Hydro Calcs/6220 Yucca St - 10 yr POST DEV - Vista Del Mar.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	6220 Yucca St
Subarea ID	10 yr POST DEV - Vista Del Mar
Area (ac)	0.2558
Flow Path Length (ft)	200.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	5.98
Percent Impervious	0.73
Soil Type	2
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	4.2697
Peak Intensity (in/hr)	2.5474
Undeveloped Runoff Coefficient (Cu)	0.8637
Developed Runoff Coefficient (Cd)	0.8902
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.5801
Burned Peak Flow Rate (cfs)	0.5801
24-Hr Clear Runoff Volume (ac-ft)	0.0669
24-Hr Clear Runoff Volume (cu-ft)	2913.6968



Peak Flow Hydrologic Analysis

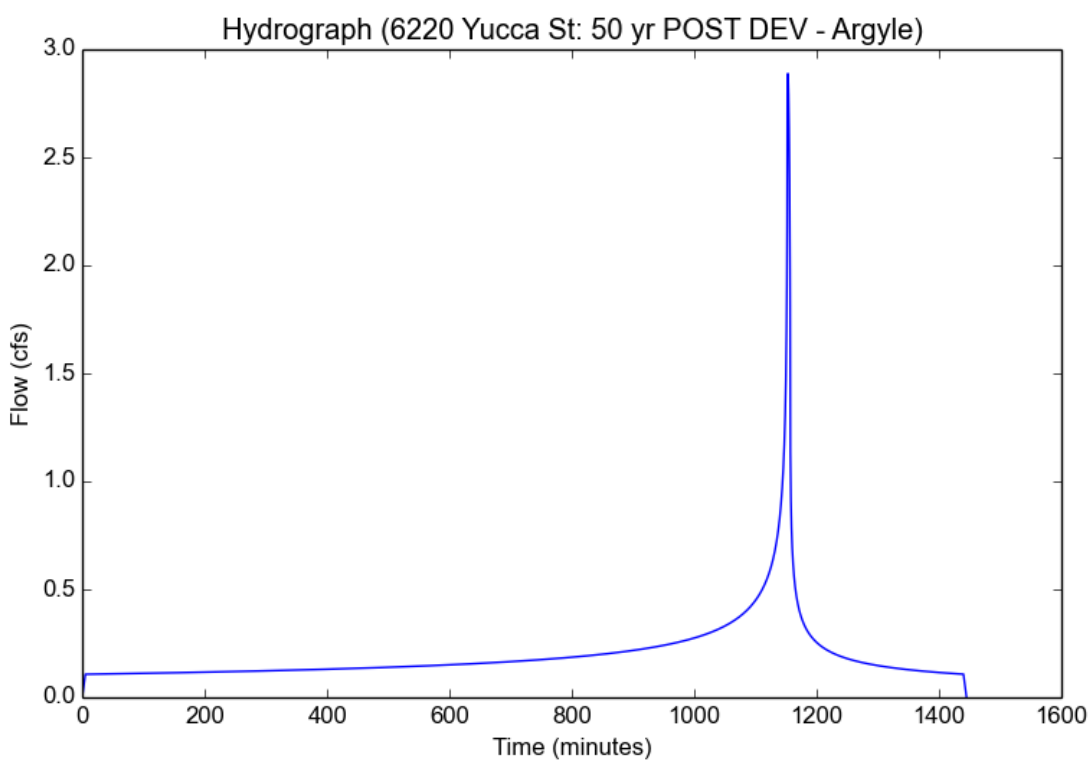
File location: P:/78015020/PLANNING/Drainage Study/Hydro Calcs/6220 Yucca St - 50 yr POST DEV - Argyle.pdf
Version: HydroCalc 0.2.0-beta

Input Parameters

Project Name	6220 Yucca St
Subarea ID	50 yr POST DEV - Argyle
Area (ac)	0.8994
Flow Path Length (ft)	250.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	5.98
Percent Impervious	1.0
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.8974
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.888
Burned Peak Flow Rate (cfs)	2.888
24-Hr Clear Runoff Volume (ac-ft)	0.4
24-Hr Clear Runoff Volume (cu-ft)	17426.0603

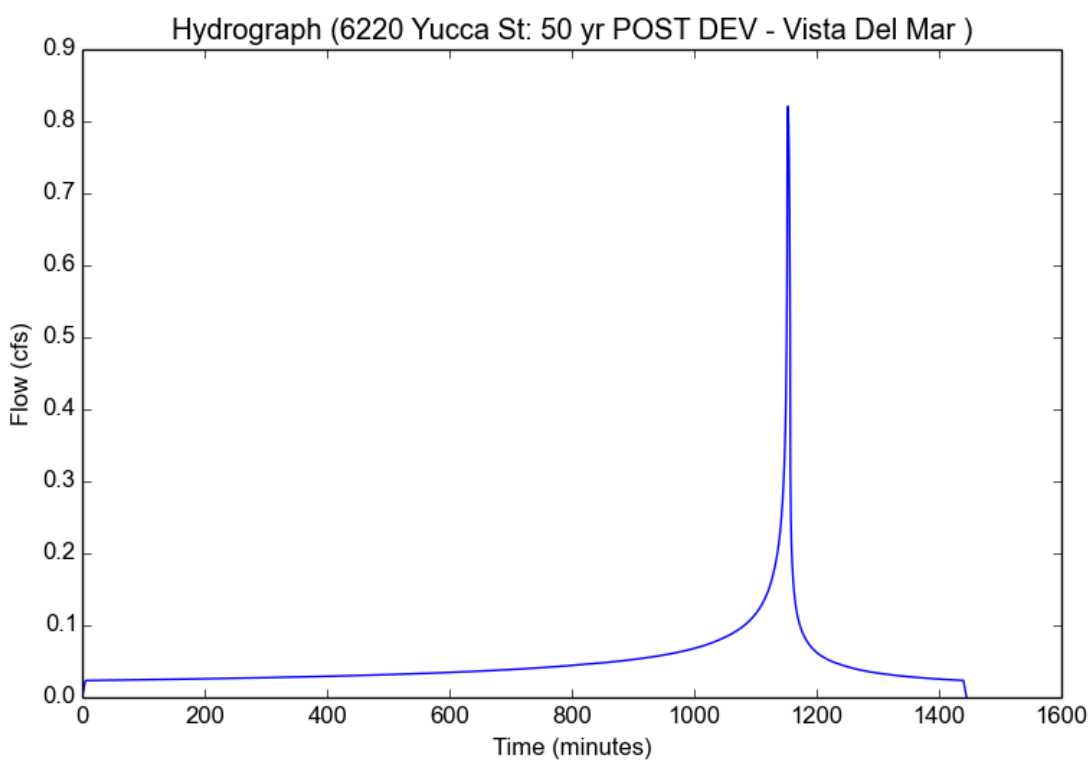


Peak Flow Hydrologic Analysis

File location: P:/78015020/PLANNING/Drainage Study/Hydro Calcs/6220 Yucca St - 50 yr POST DEV - Vista Del Mar.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	6220 Yucca St
Subarea ID	50 yr POST DEV - Vista Del Mar
Area (ac)	0.2558
Flow Path Length (ft)	200.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	5.98
Percent Impervious	0.73
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.8974
Developed Runoff Coefficient (Cd)	0.8993
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.8207
Burned Peak Flow Rate (cfs)	0.8207
24-Hr Clear Runoff Volume (ac-ft)	0.097
24-Hr Clear Runoff Volume (cu-ft)	4224.1603