APPENDIX G

HYDROLOGY/DRAINAGE REPORT

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Project No.
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Subject: Specific Plan 11, Planning Area 1
San Dimas, Los Angeles County, California

ISMD HYDROLOGY AND WATER QUALITY ANALYSIS
(HYDROLOGY AND WATER QUALITY TECHNICAL REPORT)

1.0 INTRODUCTION

This Hydrology and Water Quality Technical Report (HWQTR) assesses the potential impacts of implementation of the proposed Specific Plan 11, Planning Area 1 modifications described in the ISMD (referred to in this Technical Memorandum as the "Initial Study/Mitigated Negative Declaration") on hydrology and water quality. To evaluate potential impacts from a hydrologic perspective, hydrologic considerations including flood potential of any proposed modifications to existing land uses were evaluated. For water quality impacts, regulatory considerations consistent with the Los Angeles County Municipal Separate Storm Sewer System (MS4) and National Pollutant Discharge Elimination System (NPDES) Permit were considered. This document also summarizes mitigation measures designed specifically to reduce identified hydrologic and water quality impacts.

2.0 BACKGROUND

The City of San Dimas is located approximately 30 miles east of the City of Los Angeles within eastern Los Angeles County. Planning Area 1 (PA1) is located within the southwestern portion of the City and is located within Specific Plan 11. The majority of PA1 has been developed with single-family residences within hillside areas and is surrounded by existing hillside single-family residences. Local access to PA1 is provided by Via Verde and regional access is provided by the San Bernardino Interstate-10 (I-10) Freeway, approximately 1 mile to the south. PA1 generally drains into a storm drain system on Calle Cristina and connects via an underground storm drainage system to Walnut Creek Wash to the north. Walnut Creek Wash is a tributary of the San Gabriel River. Figure 1 shows the boundary of PA1 and its relation to Walnut Creek Wash.

According to available information through National Oceanic and Atmospheric Administration (NOAA), the area receives approximately 16 inches of annual precipitation per year (Reference 16). Soil mapping performed of PA1 by the National Resource Conservation Service indicates soil with either B or C hydrologic soil group type. Type B and C soil has low to moderate infiltration potential during rainfall events. On-site slopes range from 5 to 30 percent; and therefore, have a high proclivity for runoff during rainfall events (Reference 15). Soil mapping of the project is included in Appendix B.

According to the ISMD, the City of San Dimas is proposing to amend grading limits within PA1 and make various clean-up text amendments. Currently, Chapter 18.518: Specific Plan 11 of the San Dimas Municipal Code allows for unlimited grading (cut and fill) necessary for roadway access and excavation for retaining-type building foundations for the primary residence and garage. Additionally, the Municipal Code allows up to 35 percent building lot coverage for the subject residential lots. The proposed Municipal Code Text Amendment (MCTA) would allow for up to 1,000 cubic yards of grading (cut and fill), beyond that grading necessary for the primary residence, driveway, and garage for properties located within Specific Plan 11, Planning Area 1 (36 residential lots, up to 36,000 CY grading). Per the previous Development Plan Review Board policy, a swimming pool and 5 feet of decking surrounding the pool were exempted from the additional grading calculations. The proposed MCTA would also include development standards for the grading, landscaping, and any retaining walls that the additional grading would require. Additional text clean-up items are proposed by removing sections which dealt with the initial development of the area and codifying previous policies regarding Conditional Uses within the specific plan.

3.0 REGULATORY SETTING

This section provides the regulatory compliance framework related to hydrology and water quality.

3.1 FEDERAL

3.1.1 Federal Clean Water Act

In 1972, the Federal Water Pollution Control Act (later referred to as the Clean Water Act [CWA]) was amended to require National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants into "waters of the United States" from any point source. As defined in the CWA, "waters of the United States" are surface waters, including rivers, lakes, estuaries, coastal waters, and wetlands, that are interstate waters used in interstate and/or foreign commerce, their tributaries, territorial seas at the cyclical high tide mark, and adjacent wetlands. In 1987, Section 402 of the CWA was amended to require that the United States Environmental Protection Agency (USEPA) establish regulations for permitting of municipal and industrial stormwater discharges under the NPDES permit program. The USEPA published final regulations regarding stormwater discharges on November 16, 1990. (See 55 Fed. Reg. 47990 (Nov. 16, 1990)). The regulations require that Municipal Separate Storm Sewer System (MS4) discharges to surface waters be regulated by a NPDES permit. An MS4 is a publicly owned conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that are designed or used for collecting or conveying stormwater separately from wastewater.

In addition, CWA Section 304(a) requires states to adopt water quality standards for receiving water bodies and to have those standards approved by the USEPA. These water quality standards consist of designated beneficial uses for a particular receiving water body (e.g., wildlife habitat, agricultural supply, fishing, etc.), along with water quality criteria necessary to support those uses. Water quality criteria consist of either prescribed concentrations or levels of constituents, such as lead, suspended sediment, fecal coliform bacteria, or narrative statements describing the quality of water that supports a particular beneficial use. Because California had not established a complete list of acceptable water quality criteria, USEPA established numeric water quality criteria for certain toxic constituents in surface waters with human health or aquatic

life designated uses in the form of the California Toxics Rule (CTR). (40 C.F.R. § 131.38.) The final rule establishes ambient water quality criteria for priority toxic pollutants in the State of California.

3.1.2 Section 303(d) of the Clean Water Act

When designated beneficial uses of a particular receiving water body are compromised by impaired water quality, CWA Section 303(d) requires identifying and listing that water body as "impaired." Once a water body has been deemed impaired, a Total Maximum Daily Load (TMDL) must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, nonpoint, and natural sources that a water body may receive without exceeding applicable water quality standards (with a "factor of safety" included). Once established, the TMDL allocates the loads among current and future pollutant sources for the impaired water body. The California 303(d) Listing Policy sets the rules for identifying the waters that do not meet water quality standards. The Policy distinguishes between three categories of waters that do not meet water quality standards. The categories are: (1) requiring TMDLs; (2) water quality limited segments being addressed by a TMDL that has been developed and approved by USEPA and the approved implementation plan is expected to result in full attainment of the standard within a specified time frame; and (3) water quality limited segments being addressed by an existing regulatory program that is reasonably expected to result in the attainment of the water quality standard within a reasonable, specified time frame.

Runoff from the Project discharges to Walnut Creek Wash (State Waterbody ID: CAR405310001998091811243 3). This 303(d) impaired water body is part of the larger San Gabriel Watershed (USGS #18070106, HUC 8). Water quality impairments from Walnut Creek Wash near PA1 were considered when selecting the pollutants of concern for this water quality analysis. As shown on Table 3.1.2-1, CWA Section 303(d) Listings for the Walnut Creek Wash impairments include benthic-macroinvertebrate toxicity bioassesments, indicator bacteria, and pH.

TABLE 3.1.2-1: Walnut Creek Wash, TMDLs "List of Water Quality Limited Segments," Category 5, 2022

GEOGRAPHIC DESCRIPTION AND DISTANCE FROM PROJECT	ESTIMATED AREA ASSESSED	POLLUTANTS	TMDL COMPLETION	POTENTIAL SOURCES
Approximately ¾ mile	12 miles	• Benthic-Macroinvertebrate Bioassesments	TMDL Required 2012	Source Unknown
		• Indicator Bacteria	TMDL Required 2021	Source Unknown
		• pH	TMDL Required 2007	Source Unknown

Source: Final California 2020-2022 Integrated Report (303 (d) List/305(b) Report) Supporting Information. Regional Board 4- Los Angeles Region

Once established, the TMDL allocates the loads among current and future pollutant sources to the water body.

The Los Angeles Regional Water Quality Control Board (LARWQCB) has adopted TMDLs for nitrogen and phosphorus (Basin Plan), discussed below. These TMDLs have become effective as part of the adoption in March 2012 and fall under the following relevant permits (Reference 13).

- County of Los Angeles MS4: NPDES CAS004004 (Order R4-2021-0105)
- General Construction Stormwater: Order No. 2009-0009-DWQ, CAS000002, and amendments.

TMDLs have been assigned to Walnut Creek Wash watershed for benthic macroinvertebrate biaoassesments, indicator bacteria, and pH. The TMDLs for benthic macroinvertebrate surveys are assessed through an Index of Biological Integrity (IBI) score (Reference 9). The IBI score is a cumulative score that takes into account biological stressors of water quality parameters such as indicator bacteria, lead, zinc, copper, mercury, oil, grease, and other toxics on benthic macroinvertebrate community structure. IBI habitat scores are ranked as follows.

- Very good (80-56)
- Good (41-55)
- Fair (27-40)
- Poor (14-26)
- Very poor (0-13)

Sites with a score below 26 are considered to be impaired. IBI scores for Walnut Creek Wash were 7 (2003) and 6 (2004), placing Walnut Creek Wash on the TMDL list for this criteria (Reference 10). The criteria for pH is currently under review; however, Walnut Creek Wash is listed for pH, approved by the USEPA for listing as a TMDL. The current TMDL standard for E. Coli as the indicator bacteria is shown in Table 3.1.2-2.

TABLE 3.1.2-2: TMDL Final Annual Allowable Exceedances for Walnut Creek Wash, E Coli

CONSTITUENT	GEOMETRIC MEAN (MPN or cfu)	DAILY MAXIMUM (MPN or cfu)
E. Coli	126/100 mL	235/100mL

Reference: 2011 Water Quality Control Plan Los Angeles Region R4 Basin Plan

Per the MS4 permit, geometric mean values shall be calculated on each sample day based on a statistically sufficient number of samples (generally not less than five samples equally spaced over a 30-day period) consistent with the REC-1 Basin Plan bacteria objectives. Lastly, there is an additional TMDL for lead accounted for under the Los Angeles Regional MS4 permit applicable through September 30, 2026. For wet weather flows, an effluent limitation of 81.34 micrograms per liter, as total recoverable metals, must not be exceeded. Also, per the MS4 permit, this is applicable for San Gabriel River Reach 2 and all of its upstream reaches and tributaries including Walnut Creek Wash.

3.2 STATE

3.2.1 Fish and Game Code, Sections 1600 through 1617

The California Department of Fish and Wildlife (CDFW) is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility,

the Fish and Game Code, sections 1600-1605 require the proponent of a project that may impact a river, stream, or lake to notify the CDFW before beginning the project. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks and that support fish or other aquatic life. It also includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation.

In addition, Fish and Game Code, section 1602 requires that any entity notify the CDFW of a project, prior to beginning construction, that will: (1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; (2) use materials from a streambed; or (3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake. If the CDFW determines that the project may adversely affect existing fish and wildlife resources, a Lake and Streambed Alteration Agreement is required.

3.2.2 Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 *et seq.*)

The federal CWA places the primary responsibility for the control of surface water pollution, and for planning the development anduse of water resources, with the states. However, the CWA establishes certain guidelines for the states to follow in developing their programs and allows the USEPA to withdraw control from states with inadequate implementation mechanisms.

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Porter- Cologne Act). The Porter-Cologne Act grants the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) authority to protect water quality. It is the primary vehicle for implementation of California's responsibilities under the federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges of waste to surface and groundwater, to regulate waste disposal sites and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a water quality control plan (Basin Plan) for its region. The regional plan must conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its state water policy. To implement state and federal law, the regional plan establishes beneficial uses for surface and groundwater in the region, and sets forth narrative and numeric water quality standards to protect those beneficial uses. The Porter-Cologne Act also provides that a RWQCB may include, within its regional plan, water discharge prohibitions applicable to particular conditions, areas, or types of waste.

3.2.3 Basin Plan

The Water Quality Control Plan for the Los Angeles Region (Basin Plan) (LARWQCB 1994, as amended) provides quantitative and narrative criteria for a range of water quality constituents applicable to certain receiving water bodies and groundwater basins within the Los Angeles region. Specific criteria are provided for the larger, designated water bodies within the region, as well as general criteria or guidelines for ocean waters, bays and estuaries, inland surface waters, and groundwater. In general, the narrative criteria require that degradation of water quality does not occur dueto increases in pollutant loads that will adversely impact the designated beneficial

uses of a water body. For example, the Basin Plan requires that "inland surface waters shall not contain suspended or settleable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors." Water quality criteria apply within receiving waters as opposed to applying directly to runoff; therefore, water quality criteria from the Basin Plan are utilized as benchmarks to evaluate the potential ecological impacts of PA1 runoff on the receiving waters of the proposed PA1.

The Basin Plan lists beneficial uses of major water bodies within this region. Walnut Creek Wash is listed and has specific beneficial uses assigned to it seen in Table 3.2.3-1 (Reference 17).

TABLE 3.2.3-1: Beneficial Uses of Walnut Creek Wash

BENEFICIAL USE CODE	CODE DESCRIPTION
WARM	Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
WET	Uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants.
REC1	Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
REC2	Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
GWR	Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
MUN	Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
WILD	Uses of water that support terrestrial ecosystems including but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

3.2.4 NPDES General Permit and Waste Discharge Requirements for Discharges of Stormwater Associated with Construction Activity

Pursuant to CWA Section 402(p), the SWRCB issued a statewide general permit for stormwater discharges from construction sites [Water Quality Order 2009-0009-DWQ as well as its subsequent amendments 2010-0014-DWQ and 2012-0006-DWQ, State Water Board NPDES General Permit for Stormwater Discharges Associated with Construction Activity (NPDES No. CAR000002; adopted by the State Water Board on September 2, 2009, and became effective on July 1, 2010)]. Under the Construction General Permit (CGP), discharges of stormwater from construction sites with a disturbed area of one or more acres are required to either obtain individual NPDES permits for stormwater discharges or be covered by the CGP.

The SWRCB is currently in the process of re-issuing an updated CGP, anticipated to become effective on July 1, 2023, and would likely be in-place prior to implementation of any future proposed projects within PA1. The re-issued permit is anticipated to contain additional reporting and sampling requirements for construction projects that disturb greater than 1 acre (Draft Order WQ 2022-XXXX-DWQ, NPDES CAS00002).

3.3 LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

3.3.1 Los Angeles County MS4 Permit

In 2012, the LARWQCB issued a revised NPDES Permit and WDRs (Order No. R4-2012-0175; NPDES Permit No. CAS004001) under the Clean Water Act and the Porter-Cologne Act for discharges of urban runoff in public storm drains in Los Angeles County (County). In addition, the Regional Board issued a revised permit in September 2021 (Order No. R4-2021-0105; NPDES Permit No. CAS004004 (the MS4 Permit)). The Permittees include the City of San Dimas. The MS4 Permit regulates stormwater discharges from MS4s in PA1, and details specific requirements for new development and significant redevelopment projects, including selection, sizing, and design criteria for Low Impact Development (LID), treatment control, and hydromodification control BMPs. These requirements apply to Projects equal to 1 acre or greater of disturbed area and adding more than 10,000 square feet or more of impervious surface area for operation purposes.

During construction activities, the Los Angeles County MS4 Permit specifies minimum construction BMPs for projects under 1 acre, which do not require a CGP from the SWRCB.

3.4 LOS ANGELES COUNTY

3.4.1 Los Angeles County Low Impact Development Standards

Los Angeles County developed a “LID Standards Manual” (LACDPW 2014) (the “LID Manual”) that outlines stormwater runoff quantity and quality control development principles, technologies, and design standards for achieving the LID standards of the MS4 permit. The LID Manual provides guidance for the implementation of stormwater quality control measures in new development and redevelopment projects in the County, including within the City of San Dimas, with the intention of improving water quality and mitigating potential water quality impacts from stormwater and non-stormwater discharges.

Pages 1-2 of the LID Manual addresses the following objectives and goals (LACDPW 2014).

- Lessen the adverse impacts of stormwater runoff from development and urban runoff on natural drainage systems, receiving waters, and other water bodies;
- Minimize pollutant loadings from impervious surfaces by requiring development projects to incorporate properly designed, technically appropriate BMPs and other LID strategies.
- Minimize erosion and other hydrologic impacts on natural drainage systems by requiring development projects to incorporate properly designed, technically appropriate hydromodification control development and technologies.

3.5 CITY OF SAN DIMAS

3.5.1 Model Efficient Landscape Ordinance

On January 17, 2014, Governor Jerry Brown proclaimed the State of Emergency in the State of California due to severe drought conditions, and on April 25, 2014, the Governor declared a continued State of Emergency to exist throughout the state due to the ongoing drought. Subsequently, on April 1, 2015, the Governor issued Executive Order B-29-15 to impose restrictions to achieve a statewide 25 percent reduction in potable urban water usage through February 28, 2016.

Also, the Executive Order directed the Department of Water Resources to update the State's Model Water Efficient Landscape Ordinance (MWELO) to be more efficient in water conservation.

As a result, the City of San Dimas revised its Water Efficient Landscapes Ordinance and its implementation Guidelines to comply with the State's revisions. The amended Ordinance and Guidelines implement the state's water conservation efforts but also include guidance in creating landscapes that will preserve the character of the City and continue to uphold an appealing community environment.

The primary purpose of these Guidelines is to provide procedural and design guidance for applicants proposing new landscape or landscape rehabilitation projects that are subject to Chapter 18.14 of the City of San Dimas Municipal Code. Beginning February 1, 2016, and consistent with Executive Order No. B-29-15, this ordinance applies to all new landscape projects with an aggregate landscape area equal to or greater than 500 square feet, requiring a building or landscape permit, plan check or design review landscape projects. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 square feet are also subject to the Guidelines, if they require a building or landscape permit, plan check, or design review. (Reference 18).

4.0 THRESHOLDS OF SIGNIFICANCE, IMPACTS, AND MITIGATION

Based on Appendix G of The California Environmental Quality Act (CEQA) Guidelines and other relevant criteria, the City of San Dimas Planning Department has determined that a project would have a potentially significant impact related to water quality based on the following criteria.

- Would the project violate any water quality standards or waste discharge requirements?
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?
- Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would: (i) result in substantial erosion or siltation on- or off-site; (ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; (iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or (iv) impede or redirect flood flows?

- Would the project have impacts in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?
- Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

It has been noted that additional stormwater regulatory requirements may be in order as the project develops.

4.1 IMPACT 1 - CONSTRUCTION WATER QUALITY ISSUES

The development of future proposed projects within PA1 could result in temporary disturbance of surface soil and removal of vegetative cover, potentially causing temporary sediment mobilization in a manner which would result in substantial erosion or siltation. In addition, during construction, other temporary potential pollutants, such as paint, asphalt, or other compounds could become mobilized by wind or rain events. If erosion, siltation, or other construction-related pollutants of concern entered downstream watercourses during construction operations, the project would potentially violate water quality standards. This impact is related to CEQA significance criteria 'A' and 'D'.

During any grading activities, BMPs would be implemented in compliance with the State's Construction General Permit and the 2021 Los Angeles County MS4 Permit. In accordance with these regulatory requirements, any potential project within the Planning Area would reduce or prevent erosion and sediment transport and the transport of other potential pollutants from the site through implementation of BMPs meeting BAT/BCT (Best Available Technology/Best Control Technology). BAT/BCT are Clean Water Act technology-based standards that are applicable to construction site stormwater discharges. If any potential project would impact more than 1 acre, the BMPs to be implemented would be documented in a Stormwater Pollution Prevention Plan (SWPPP), which will be filed with the State Water Resources Control Board and receive a Waste Discharge Identification (WDID) number before commencement of construction activities. Projects under 1 acre would be subject to the BMPs outlined in the 2021 Los Angeles County MS4 Permit.

The following types of BMPs would be included in the permit documents and implemented as-needed during construction.

- Erosion control. Vegetation and other materials (such as straw, fiber, stabilizing emulsion, etc.) placed to stabilize areas of disturbed soil, reduce loss of soil due to the action of water or wind, and prevent water pollution.
- Sediment control. Practices that trap soil particles on site after they have been eroded by rain, flowing water, or wind. They include those practices that intercept and slow or detain the flow of storm water to allow sediment to settle and be trapped (e.g., silt fence, sediment basin, fiber rolls, etc.).
- Waste and Materials Management. Measures include covered storage and secondary containment for material storage areas, secondary containment for portable toilets, covered dumpsters, dedicated and lined concrete washout/waste areas, proper application of chemicals, and proper disposal of all manner of waste products including solid, liquid, sanitary, concrete, hazardous, and equipment-related wastes.

- Non-Stormwater Management. Practices designed to reduce or eliminate the addition of pollutants to construction site runoff through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, water conservation practices, vehicle and equipment cleaning and fueling practices, street sweeping, and other actions.
- Training and Education. Training of individuals responsible for BMP implementation and permit compliance, including contractors and subcontractors, and include appropriate certification through the State Water Board for Qualified SWPPP Developers and Qualified SWPPP Practitioners.
- Inspection, Maintenance, Monitoring and Sampling. Includes site inspections before, during, and after storm events, construction site monitoring plans to address leaks and spills of non-visible pollutants, and water quality sampling for turbidity and pH.

Construction activities will be conducted in compliance with the State's Construction General Permit and the LA Regional Water Board's 2021 MS4 Permit. With incorporation of these regulatory compliance measures, the Project would not result in any new significant impacts related to construction waste discharge requirements, or obstruction of a water quality control plan, as described in the CEQA significance criteria 'A' and 'E'.

4.2 IMPACT 2 – POST- CONSTRUCTION OPERATIONAL IMPACTS (WATER QUALITY, ALTERATION OF DRAINAGE PATTERNS OR RESULT IN FLOODING OFF-SITE)

The development of future proposed projects within PA1 could result in operational water quality impacts to nearby water bodies by affecting storm runoff quality, which could violate water quality standards and otherwise substantially degrade water quality after construction is completed. The project could also increase runoff by adding additional impervious areas that would potentially impact downstream drainage conveyance structures and channels. These impacts are related to CEQA significance criteria 'A', 'C', and 'E'.

The proposed PA1 does not have enough specific information to conduct a complete analysis of hydrologic impacts at this time. However, we can assume that additional activities in the proposed project would create additional impervious areas as well as increase the size of on-lot drainage management areas, which would increase the amount of rainfall runoff directed into the on-site storm drain system as compared to the existing condition.

As shown in Figure 2, we have estimated the existing and potential proposed drainage areas (north and south sections) within the proposed PA1. The PA1 area was subdivided into these two sections based on the direction of existing storm drain systems within the PA1 area. Using Los Angeles County Flood Control Standards, we used a runoff coefficient of 0.1 for existing, undeveloped conditions and a runoff coefficient of 0.7 for areas where development may occur. We estimated the tributary watershed areas, corresponding slope, flow path length, and soil type (rating 089) for use in Los Angeles County approved HydroCalc software (Reference 19). Slope and flow path lengths were calculated from Figure 2 and the corresponding design storm depth was obtained from Reference 21.

HydroCalc provided estimates for the predicted pre- and post-development scenarios of peak flow runoff expected from an 85th percentile storm, 10-year recurrence interval storm, and 100-year recurrence interval storm. The recurrence interval is based on the probability that the given event

will be equaled or exceeded in any given year. For example, there is a 1 in 50 chance that a 50-year recurrence interval storm of rain will occur during any given year. An 85th percentile storm has an 85 percent chance in occurring in any given year. The peak stormwater flows for each assumed watershed are summarized in Table 4.2.1:

TABLE 4.2-1: Hydrocalc Pre and Post Project Peak Flow Estimates

	NORTH PRE-PROJECT SUBWATERSHED	NORTH POST-PROJECT SUBWATERSEHD	SOUTH PRE-PROJECT SUBWATERSHED	SOUTH POST-PROJECT SUBWATERSHED
Area (acres)	8.29	8.38	14.17	16.85
85th Percentile Peak Flow (cfs)	1.29	1.30	1.74	2.06
10-year Peak Flow (cfs)	14.80	14.96	19.37	23.04
100-year Peak Flow (cfs)	28.40	28.71	37.28	44.32

In summary, if PA1 were developed, we estimate a negligible (approximately 1 percent) increase in unmitigated post-project runoff from the northern subwatershed area and approximately a 16 percent increase in the southern subwatershed area based on our assumptions and per the results on Table 4.2-1. This is in direct proportion to the amount of developed land added in post-project conditions. For detailed results of the HydroCalc analysis, please see Appendix A.

Prior to issuing a grading permit for future proposed projects within PA1, a grading and drainage plan would be required for review and approval by the Building Official and City Engineer. The grading and drainage plan would evaluate the ability of existing downstream infrastructure to safely collect and convey any additional runoff created by future projects into the existing storm drainage system in accordance with San Dimas and LA County standards. Also, any future projects which intend to develop greater than 10,000 square feet of impervious area would be subject to water quality requirements outlined in the LA Regional Water Board's 2021 MS4 Permit, the Los Angeles County LID Manual, or future MS4 permits that would become effective in the future. Lastly, any new project would conform to the local ordinance from the City of San Dimas or local Water Agency to limit excess irrigation water into the PA1 storm drainage system.

Post-construction operational activities of any future projects within PA1 will be conducted in compliance with a City of San Dimas approved grading and drainage plan as well as the Los Angeles Regional Water Board's 2021 MS4 Permit, Los Angeles County LID Manual where applicable, and local drought-tolerant landscaping ordinances. With incorporation of these regulatory compliance measures, the project would not substantially violate any water quality standards or waste discharge requirements, not substantially alter the existing drainage pattern of the site that would result in substantial erosion, not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site, nor create or contribute runoff that exceeds the capacity of existing or planned drainage systems, nor provide substantial additional sources of polluted runoff; nor impede or redirect flood flows, nor conflict with or obstruct implementation of a water quality control plan as described in the CEQA significance criteria 'A', 'C', and 'E'.

4.3 IMPACT 3 – (FLOOD HAZARD, TSUNAMI, OR SEICHE ZONES).

There are no oceans, lakes, reservoirs or other flood hazards near the project site; therefore, flooding or water quality impacts from seiche and tsunami, or seiche zones are not anticipated. Any proposed future project within PA1 would have no risk of release of pollutants because of project inundation due to a flood hazard, tsunami, or seiche zones as described in the CEQA significance criteria 'D'.

4.4 IMPACT 4 – (SUSTAINABLE GROUNDWATER MANAGEMENT PLAN).

The project site is developed with existing residential homes and additional residential development is proposed. Given the hillside nature of PA1, significant groundwater recharge from the area is unlikely. Therefore, any future project in PA1 would not interfere with implementation of a groundwater recharge of a groundwater management plan, as described in the CEQA significance criteria 'B' and 'E'.

5.0 SIGNIFICANCE OF IMPACT AFTER MITIGATION

It is our assessment that in review of the description of the modifications described to the area proposed by the City of San Dimas, proper mitigation and regulatory compliance would result in ***less than significant impacts*** related to hydrology and water quality. As summarized above, the Project would not result in any new significant impacts with respect to hydrology or water quality with implementation of stormwater BMPs, adherence to the mitigation measures already proposed for the Project, and compliance regulatory requirements.

Sincerely,

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Attachments: List of Selected References
Figure 1 – Vicinity Map
Figure 2 – Hydrologic Analysis PA1
Appendix A1 - HydroCalc Summary
Appendix A2 – Los Angeles County Soil Map
Appendix B1 – USDA NRCS Regional Soil Map
Appendix B2 – USDA NRCS Soil Description of Zaca-Apollo Complex

SELECTED REFERENCES

1. Water Quality Control Plan for the Los Angeles Region, California Regional Water Quality Control Board, Los Angeles Region 4, February 23, 1995.

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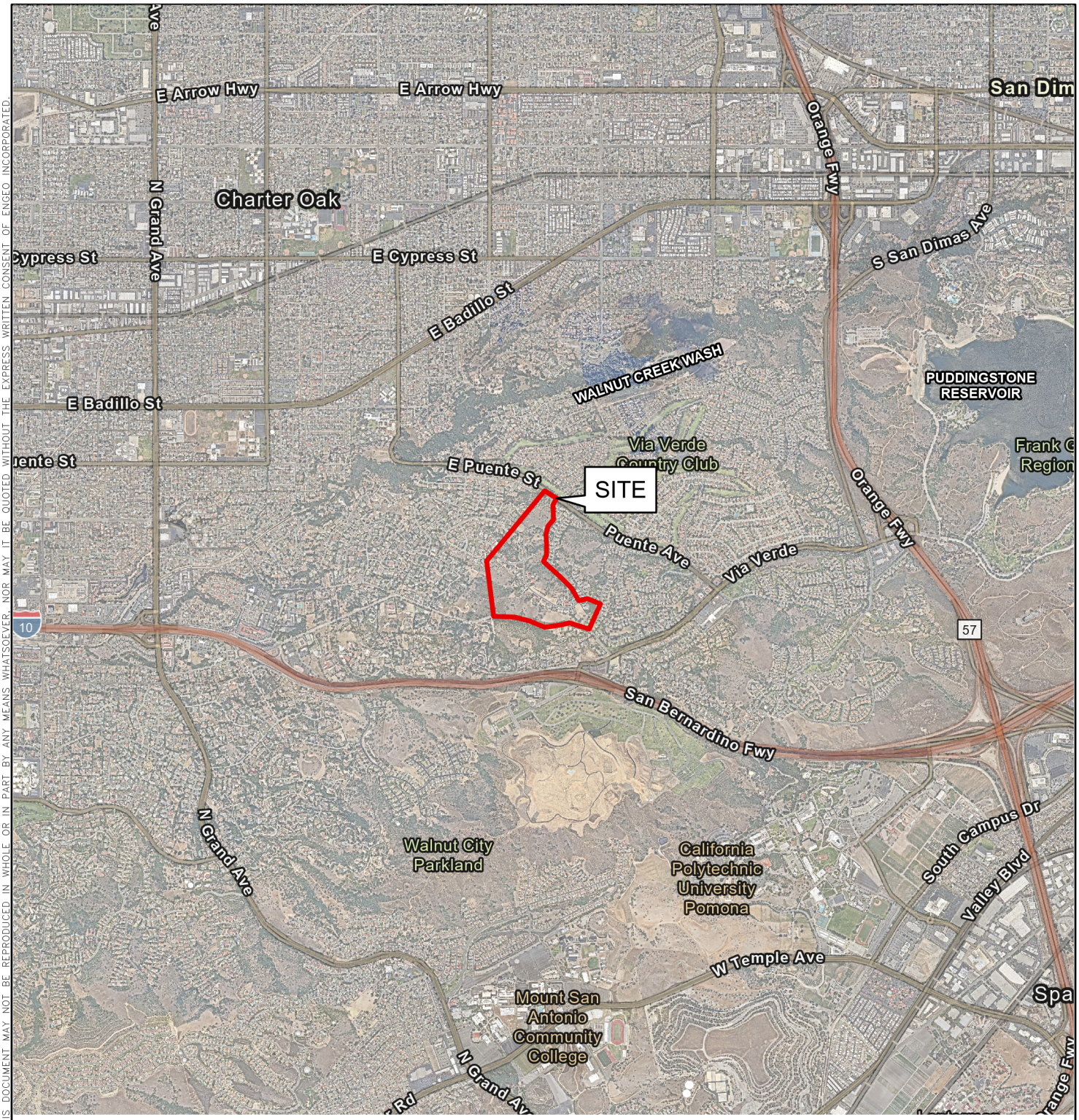
FIGURES



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FEET

BASEMAP SOURCE: GOOGLE EARTH MAPPING SERVICE 2022

ENGEO Expect Excellence

VICINITY MAP

CITY OF SAN DIMAS - HWQTR

SAN DIMAS, CALIFORNIA

PROJECT NO. :	20200.000.001
SCALE:	AS SHOWN
DRAWN BY: NLK	CHECKED BY: JB

FIGURE NO. 1

PATH: G:\DRAFTING\PROJECTS_20000 TO 21999\20200\20200000001\WQTR\WQTR.APRX
LAYOUT: VICINITY USER: NLAMOTTEKERR

ORIGINAL FIGURE PRINTED IN COLOR

PROJECT SITE AREA	96.93 ACRES
NORTH DRAINAGE AREA (PRE PROJECT)	8.29 ACRES
NORTH DRAINAGE AREA (POST PROJECT)	8.38 ACRES
SOUTH DRAINAGE AREA (PRE PROJECT)	14.17 ACRES
SOUTH DRAINAGE AREA (POST PROJECT)	16.85 ACRES

N

0 350 700

FEET

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- PROJECT SITE
- 25FT CONTOUR
- NORTH DRAINAGE AREA (PRE PROJECT)
- NORTH DRAINAGE AREA (POST PROJECT)
- SOUTH DRAINAGE AREA (PRE PROJECT)
- SOUTH DRAINAGE AREA (POST PROJECT)

BASEMAP SOURCE: GOOGLE EARTH MAPPING SERVICE 2022

ENGEO Expect Excellence

HYDROLOGIC ANALYSIS PA1

CITY OF SAN DIMAS - HWQTR

SAN DIMAS, CALIFORNIA

PROJECT NO. : 20200.000.001

SCALE: AS SHOWN

DRAWN BY: NLK CHECKED BY: JB

FIGURE NO. 2

PATH: G:\DRAFTING\PROJECTS_20000 TO 21999\20200\20200000001\WQTR\WQTR.APRX
LAYOUT: LAYOUT USER: NLAMOTTEKERR

ORIGINAL FIGURE PRINTED IN COLOR

APPENDIX A1

HydroCalc Summary

Peak Flow Hydrologic Analysis

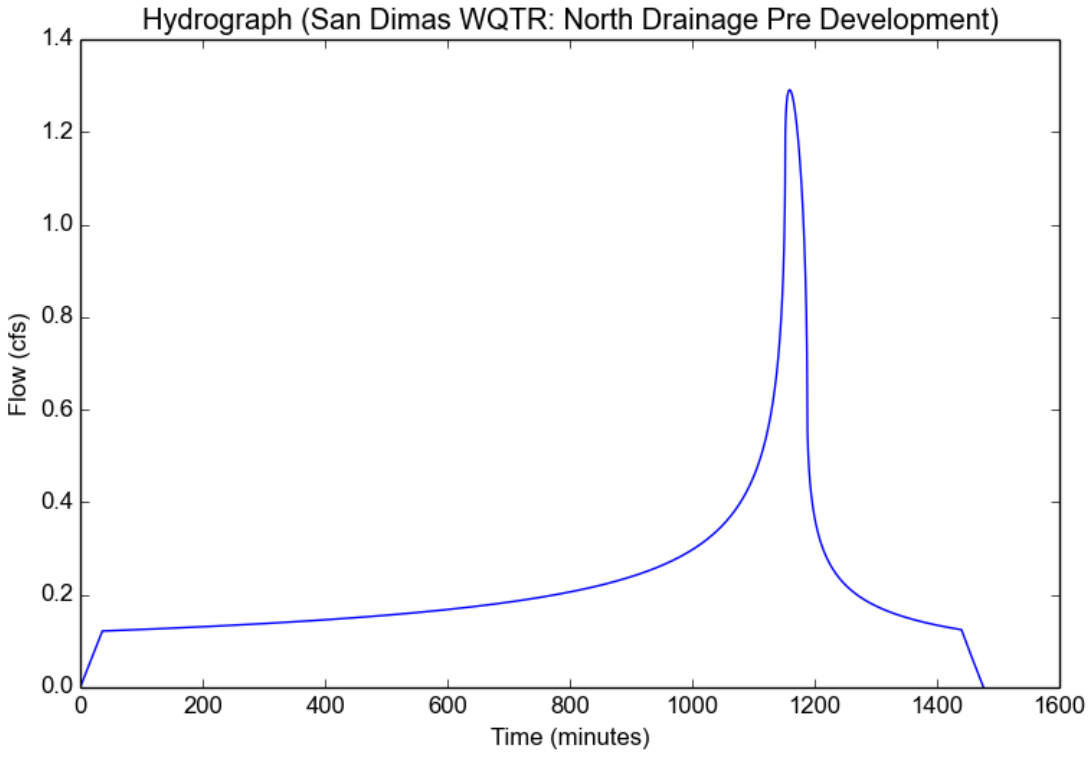
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	North Drainage Pre Development
Area (ac)	8.29
Flow Path Length (ft)	1178.73
Flow Path Slope (vft/hft)	0.0648
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.2359
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.66
Time of Concentration (min)	36.0
Clear Peak Flow Rate (cfs)	1.2908
Burned Peak Flow Rate (cfs)	1.2908
24-Hr Clear Runoff Volume (ac-ft)	0.4522
24-Hr Clear Runoff Volume (cu-ft)	19697.3669



Peak Flow Hydrologic Analysis

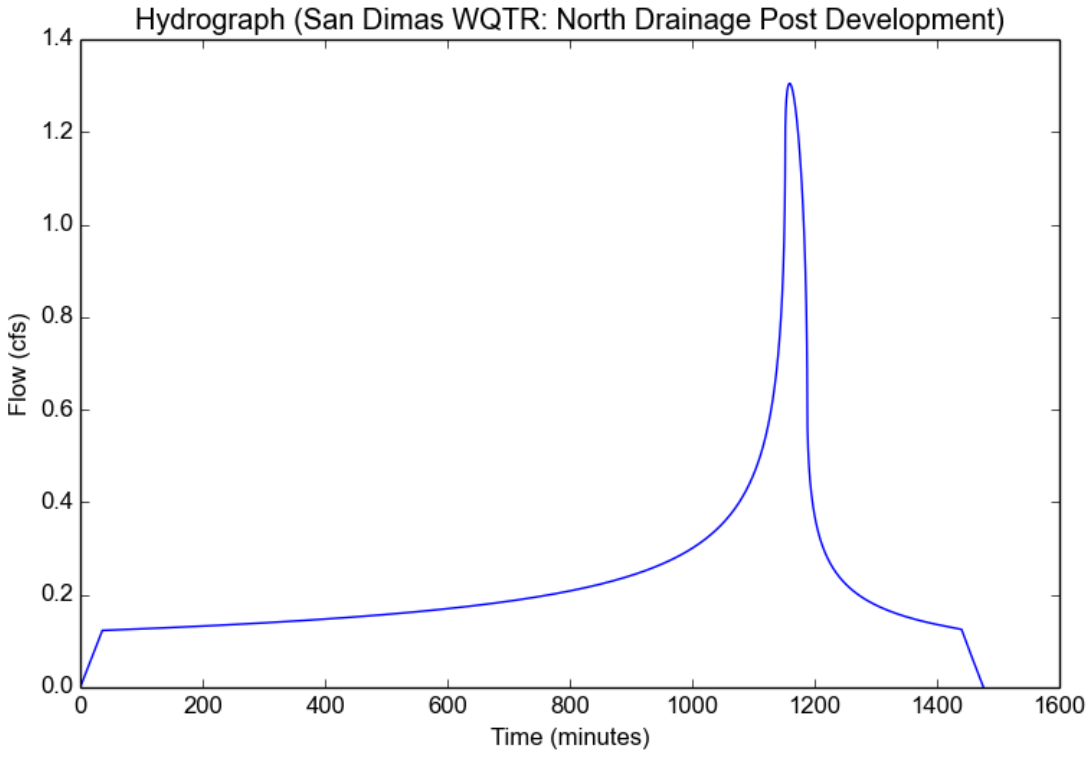
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	North Drainage Post Development
Area (ac)	8.38
Flow Path Length (ft)	1178.73
Flow Path Slope (vft/hft)	0.0648
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.2359
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.66
Time of Concentration (min)	36.0
Clear Peak Flow Rate (cfs)	1.3048
Burned Peak Flow Rate (cfs)	1.3048
24-Hr Clear Runoff Volume (ac-ft)	0.4571
24-Hr Clear Runoff Volume (cu-ft)	19911.2105



Peak Flow Hydrologic Analysis

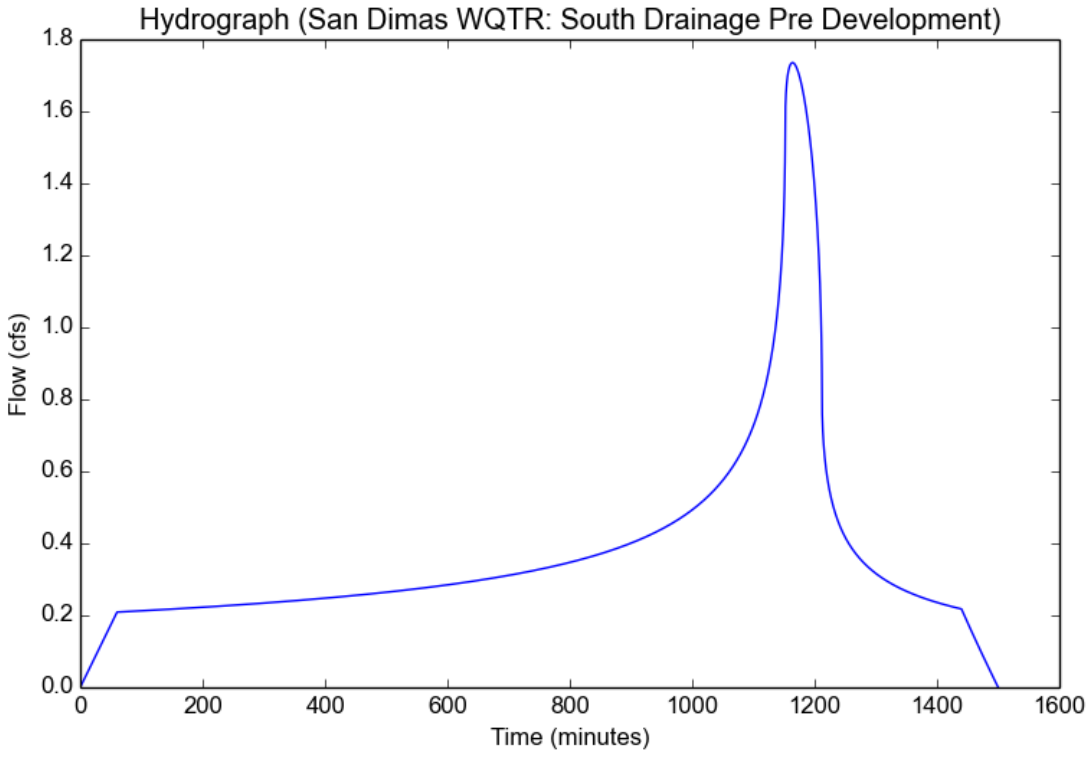
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	South Drainage Pre Development
Area (ac)	14.17
Flow Path Length (ft)	2081.3
Flow Path Slope (vft/hft)	0.0279
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.1856
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.66
Time of Concentration (min)	60.0
Clear Peak Flow Rate (cfs)	1.7354
Burned Peak Flow Rate (cfs)	1.7354
24-Hr Clear Runoff Volume (ac-ft)	0.7729
24-Hr Clear Runoff Volume (cu-ft)	33669.4971



Peak Flow Hydrologic Analysis

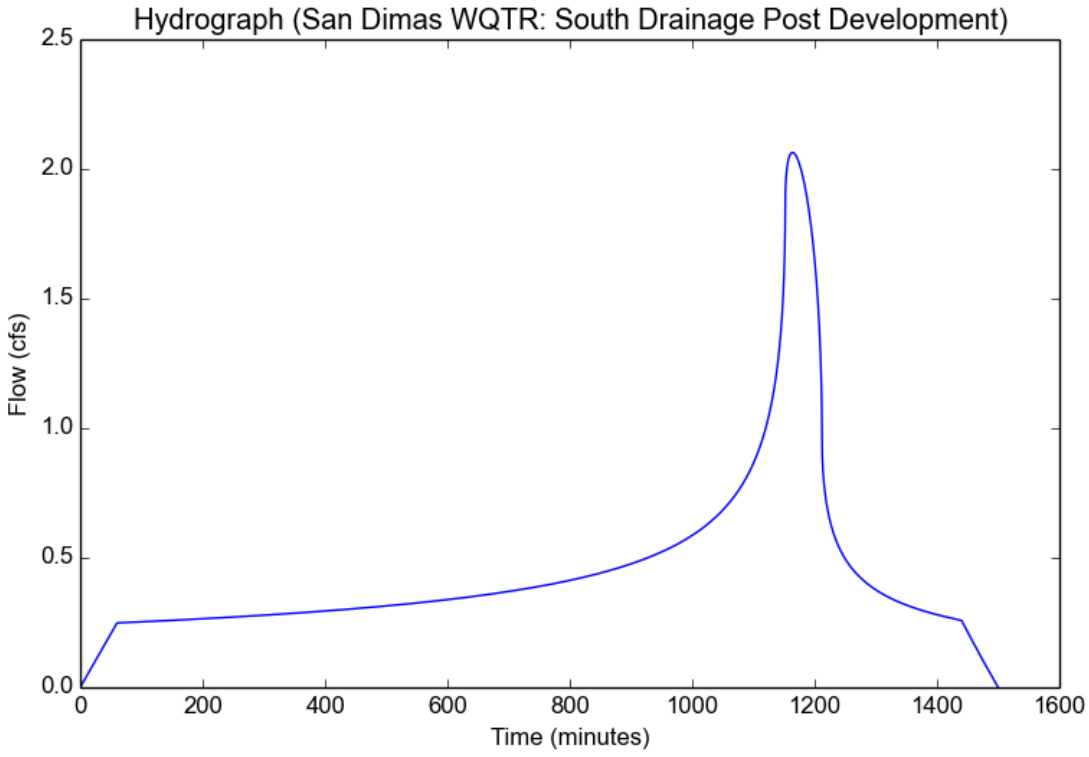
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	South Drainage Post Development
Area (ac)	16.85
Flow Path Length (ft)	2081.3
Flow Path Slope (vft/hft)	0.0279
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.1856
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.66
Time of Concentration (min)	60.0
Clear Peak Flow Rate (cfs)	2.0636
Burned Peak Flow Rate (cfs)	2.0636
24-Hr Clear Runoff Volume (ac-ft)	0.9191
24-Hr Clear Runoff Volume (cu-ft)	40037.4753



Peak Flow Hydrologic Analysis

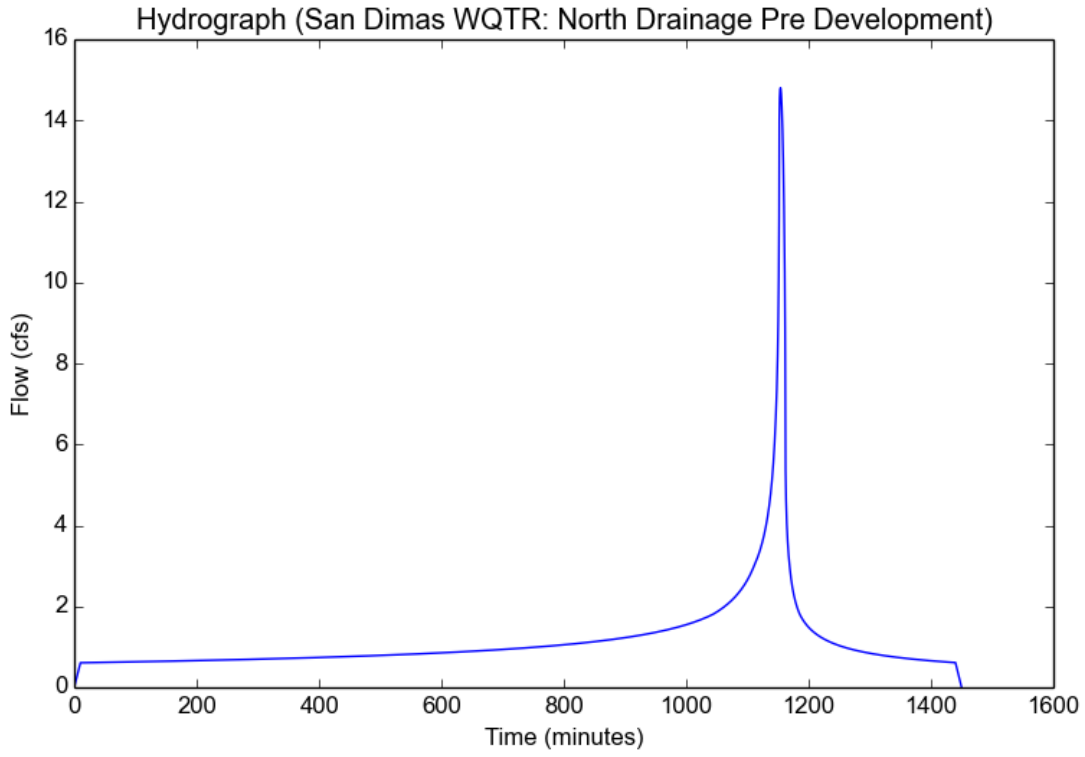
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	North Drainage Pre Development
Area (ac)	8.29
Flow Path Length (ft)	1178.73
Flow Path Slope (vft/hft)	0.0648
50-yr Rainfall Depth (in)	7.03
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.0194
Peak Intensity (in/hr)	2.1621
Undeveloped Runoff Coefficient (Cu)	0.6529
Developed Runoff Coefficient (Cd)	0.8259
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	14.8028
Burned Peak Flow Rate (cfs)	14.8028
24-Hr Clear Runoff Volume (ac-ft)	2.3515
24-Hr Clear Runoff Volume (cu-ft)	102429.6605



Peak Flow Hydrologic Analysis

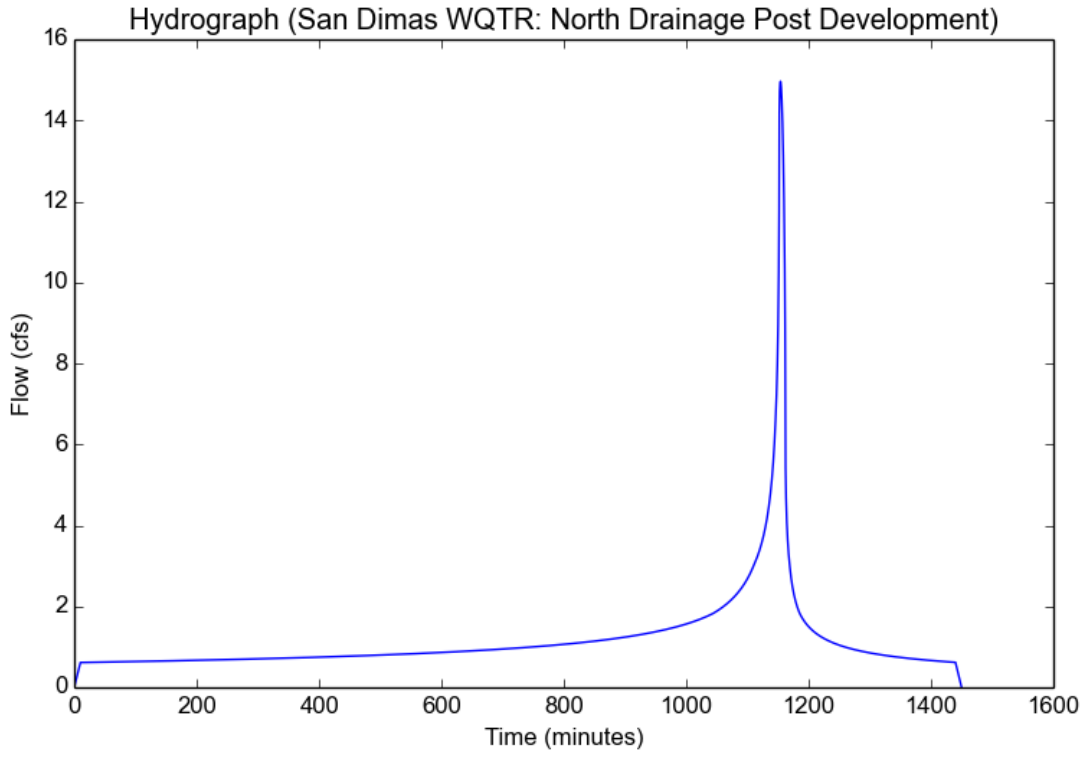
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	North Drainage Post Development
Area (ac)	8.38
Flow Path Length (ft)	1178.73
Flow Path Slope (vft/hft)	0.0648
50-yr Rainfall Depth (in)	7.03
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.0194
Peak Intensity (in/hr)	2.1621
Undeveloped Runoff Coefficient (Cu)	0.6529
Developed Runoff Coefficient (Cd)	0.8259
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	14.9635
Burned Peak Flow Rate (cfs)	14.9635
24-Hr Clear Runoff Volume (ac-ft)	2.377
24-Hr Clear Runoff Volume (cu-ft)	103541.6834



Peak Flow Hydrologic Analysis

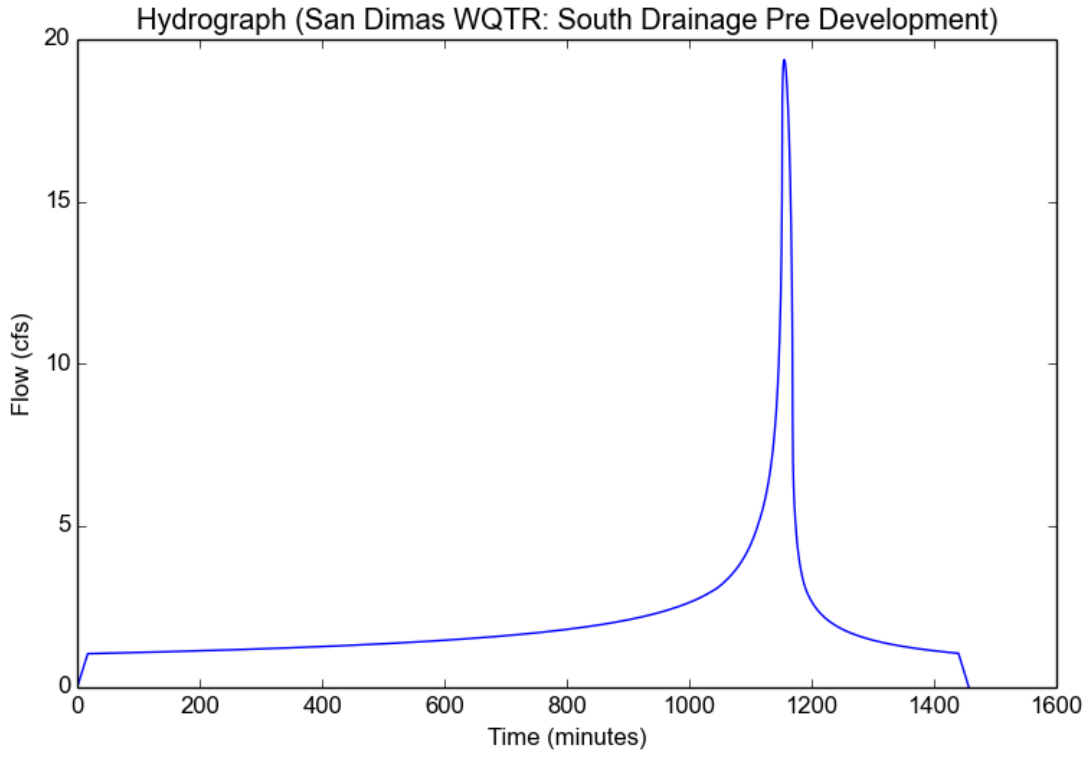
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	South Drainage Pre Development
Area (ac)	14.17
Flow Path Length (ft)	2081.3
Flow Path Slope (vft/hft)	0.0279
50-yr Rainfall Depth (in)	7.03
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.0194
Peak Intensity (in/hr)	1.6849
Undeveloped Runoff Coefficient (Cu)	0.605
Developed Runoff Coefficient (Cd)	0.8115
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	19.3738
Burned Peak Flow Rate (cfs)	19.3738
24-Hr Clear Runoff Volume (ac-ft)	4.0176
24-Hr Clear Runoff Volume (cu-ft)	175008.6468



Peak Flow Hydrologic Analysis

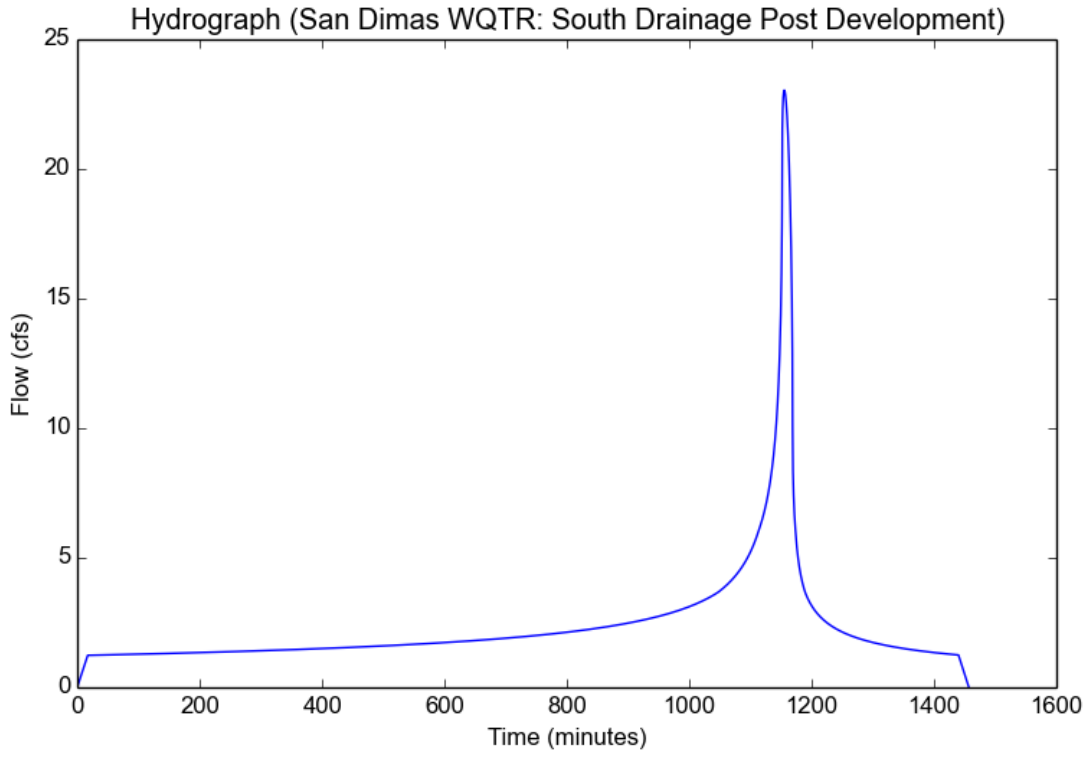
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	South Drainage Post Development
Area (ac)	16.85
Flow Path Length (ft)	2081.3
Flow Path Slope (vft/hft)	0.0279
50-yr Rainfall Depth (in)	7.03
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	10-yr
Fire Factor	0
LID	False

Output Results

Modeled (10-yr) Rainfall Depth (in)	5.0194
Peak Intensity (in/hr)	1.6849
Undeveloped Runoff Coefficient (Cu)	0.605
Developed Runoff Coefficient (Cd)	0.8115
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	23.038
Burned Peak Flow Rate (cfs)	23.038
24-Hr Clear Runoff Volume (ac-ft)	4.7775
24-Hr Clear Runoff Volume (cu-ft)	208108.3767



Peak Flow Hydrologic Analysis

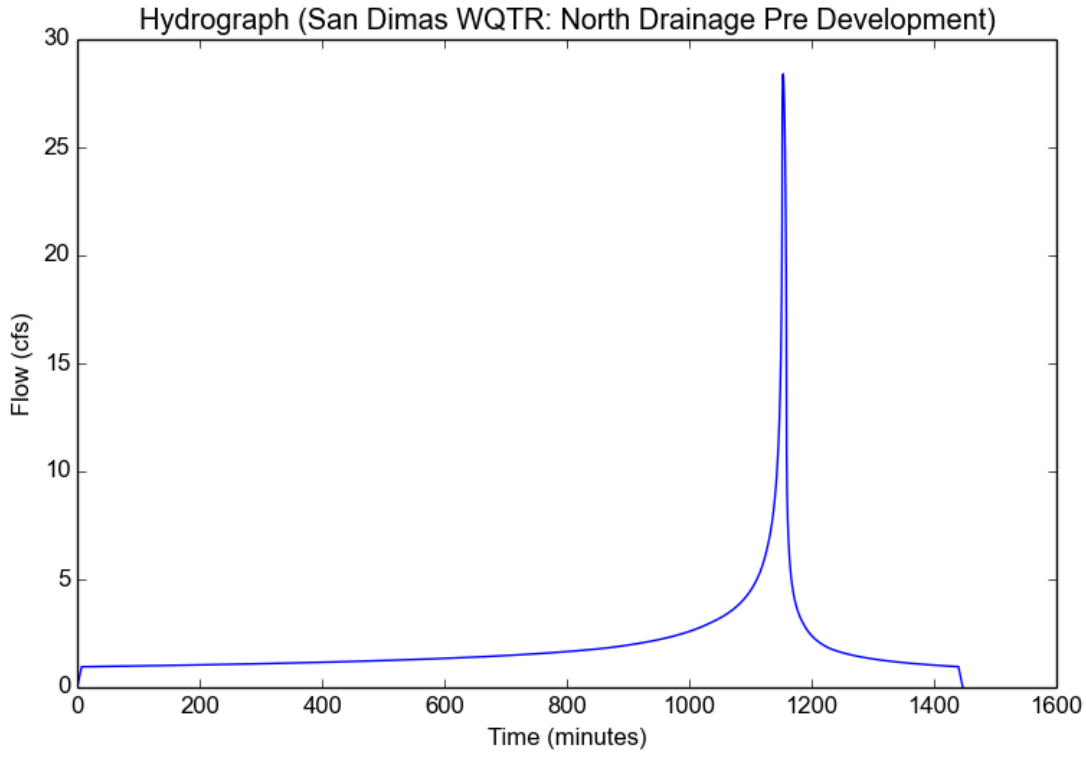
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	North Drainage Pre Development
Area (ac)	8.29
Flow Path Length (ft)	1178.73
Flow Path Slope (vft/hft)	0.0648
50-yr Rainfall Depth (in)	7.03
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.8877
Peak Intensity (in/hr)	4.0176
Undeveloped Runoff Coefficient (Cu)	0.7423
Developed Runoff Coefficient (Cd)	0.8527
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	28.4002
Burned Peak Flow Rate (cfs)	28.4002
24-Hr Clear Runoff Volume (ac-ft)	3.7833
24-Hr Clear Runoff Volume (cu-ft)	164801.8713



Peak Flow Hydrologic Analysis

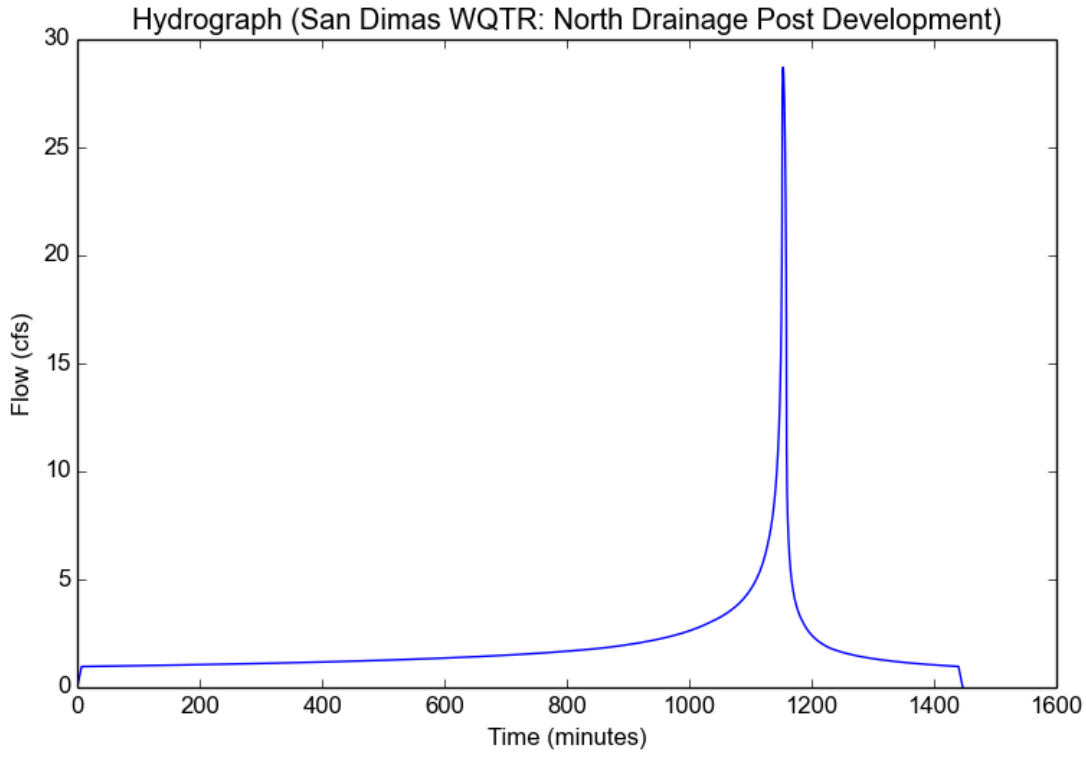
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	North Drainage Post Development
Area (ac)	8.38
Flow Path Length (ft)	1178.73
Flow Path Slope (vft/hft)	0.0648
50-yr Rainfall Depth (in)	7.03
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.8877
Peak Intensity (in/hr)	4.0176
Undeveloped Runoff Coefficient (Cu)	0.7423
Developed Runoff Coefficient (Cd)	0.8527
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	28.7085
Burned Peak Flow Rate (cfs)	28.7085
24-Hr Clear Runoff Volume (ac-ft)	3.8244
24-Hr Clear Runoff Volume (cu-ft)	166591.0351



Peak Flow Hydrologic Analysis

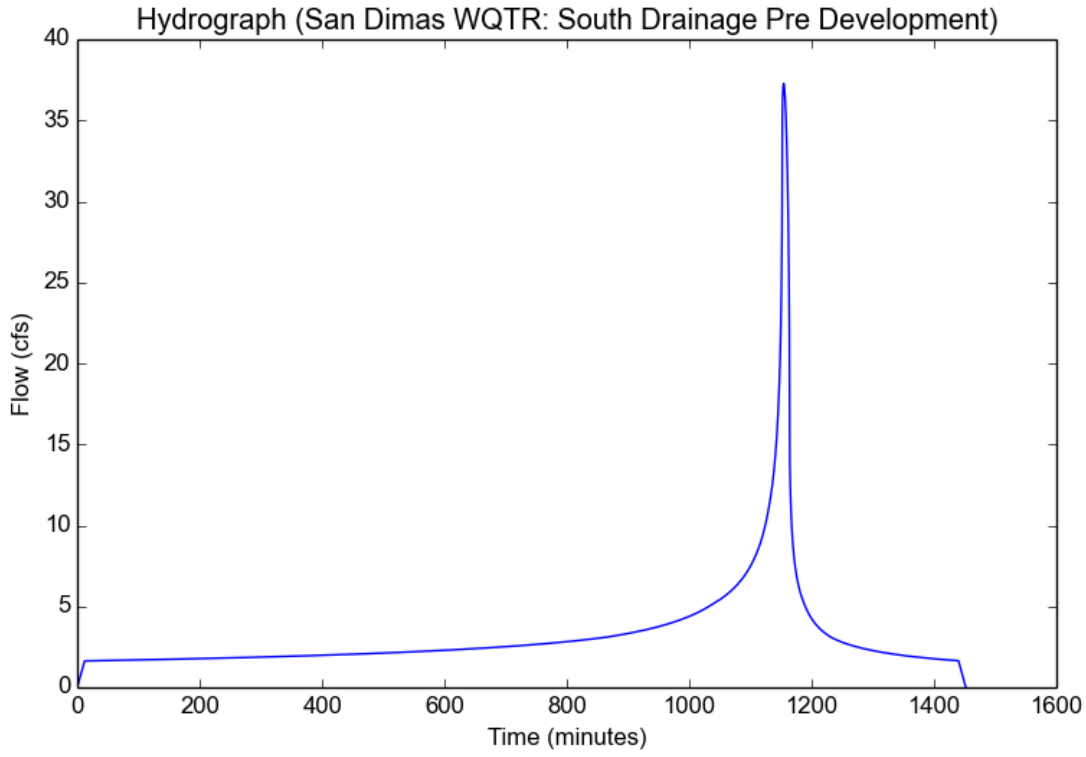
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	South Drainage Pre Development
Area (ac)	14.17
Flow Path Length (ft)	2081.3
Flow Path Slope (vft/hft)	0.0279
50-yr Rainfall Depth (in)	7.03
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.8877
Peak Intensity (in/hr)	3.1185
Undeveloped Runoff Coefficient (Cu)	0.7118
Developed Runoff Coefficient (Cd)	0.8435
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	37.2755
Burned Peak Flow Rate (cfs)	37.2755
24-Hr Clear Runoff Volume (ac-ft)	6.4657
24-Hr Clear Runoff Volume (cu-ft)	281646.9164



Peak Flow Hydrologic Analysis

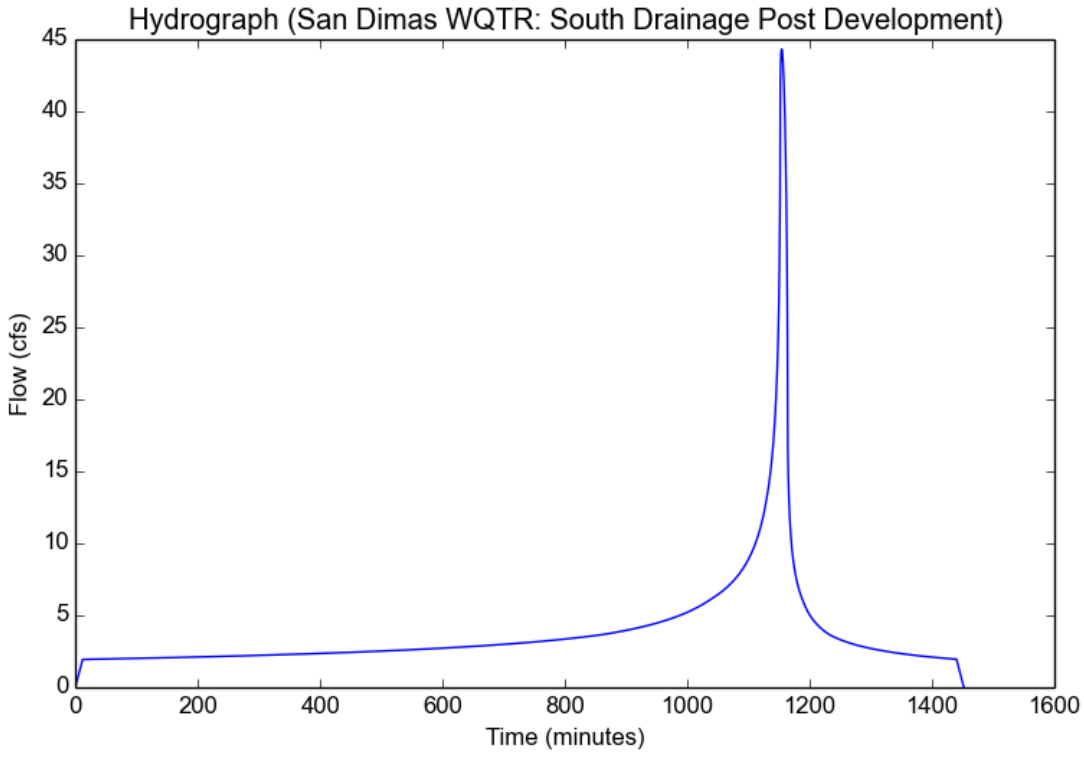
File location: //engeo.com/files/Active Projects/_20000 to 21999/20200/20200000001 - San Dimas Specific Plan Hydro Study/HydroCalc Data/San Dimas
Version: HydroCalc 1.0.3

Input Parameters

Project Name	San Dimas WQTR
Subarea ID	South Drainage Post Development
Area (ac)	16.85
Flow Path Length (ft)	2081.3
Flow Path Slope (vft/hft)	0.0279
50-yr Rainfall Depth (in)	7.03
Percent Impervious	0.7
Soil Type	89
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	7.8877
Peak Intensity (in/hr)	3.1185
Undeveloped Runoff Coefficient (Cu)	0.7118
Developed Runoff Coefficient (Cd)	0.8435
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	44.3255
Burned Peak Flow Rate (cfs)	44.3255
24-Hr Clear Runoff Volume (ac-ft)	7.6886
24-Hr Clear Runoff Volume (cu-ft)	334915.3523



APPENDIX A2

Los Angeles County Soil Map

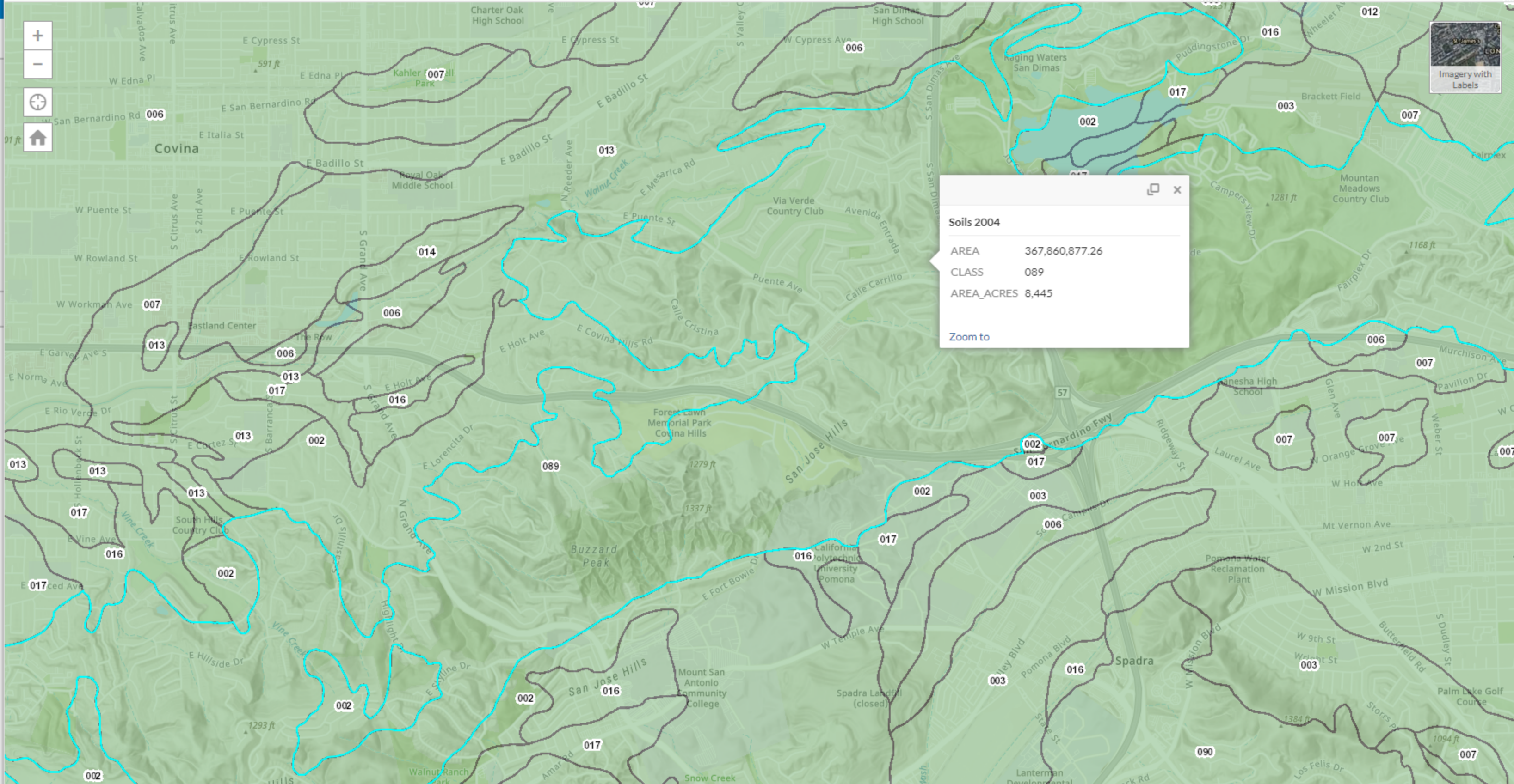
About | Legend | Layers

LA County Hydrology Map

Find address or place

Layers

- [x] Hydrology GIS
  - [ ] 50yr Two Tenths (Rainfall)
  - [ ] DPA Zones
  - [x] Soils 2004
  - [ ] Final 85th Percentile, 24-hr Rainfall
  - [ ] 1-year, 1-hour Rainfall Intensity
  - [ ] Final 95th Percentile, 24-hr Rainfall
- [x] LA County Parcels



Soils 2004

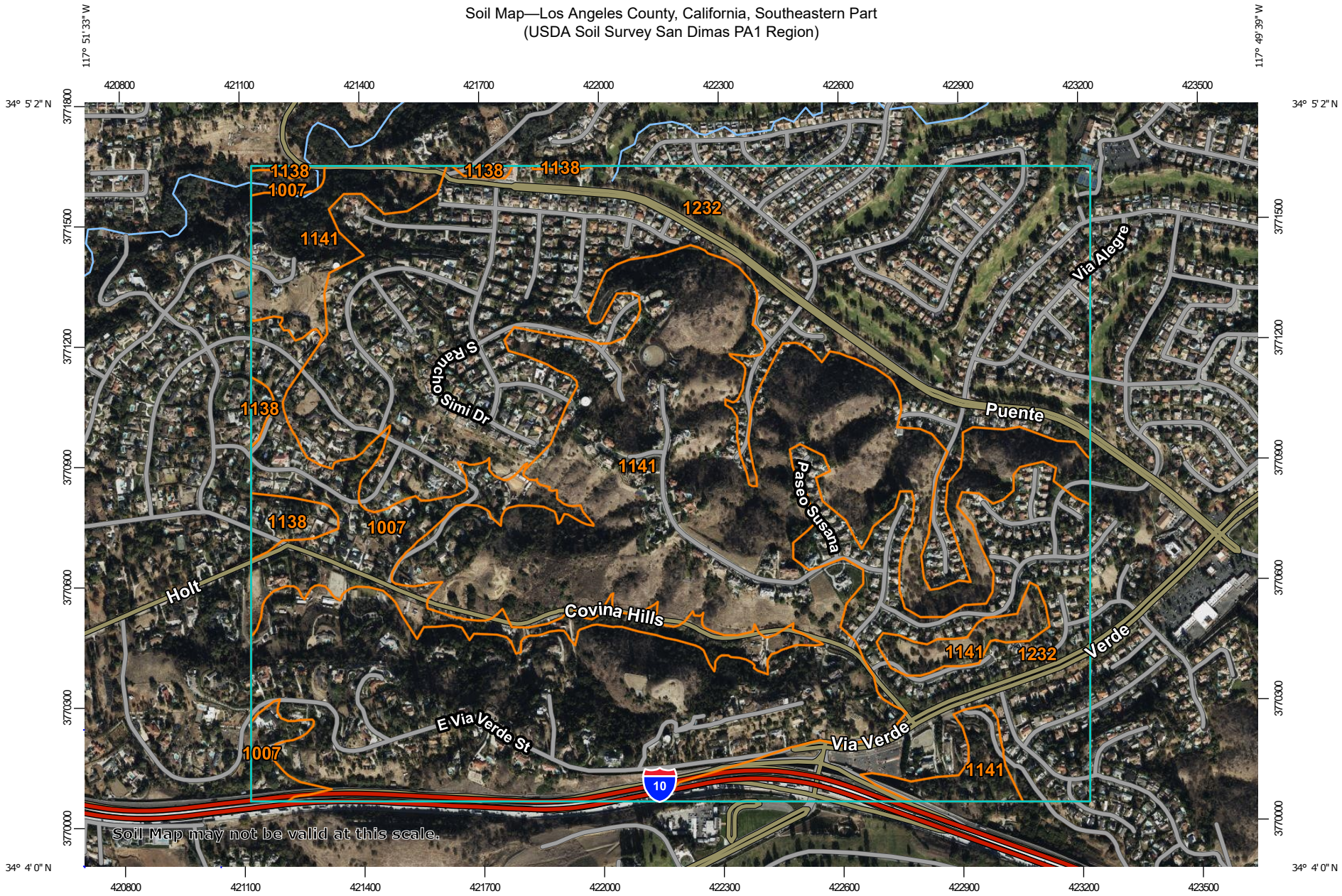
AREA	367,860,877.26
CLASS	089
AREA_ACRES	8,445

Zoom to

APPENDIX B1

USDA NRCS Regional Soil Map

Soil Map—Los Angeles County, California, Southeastern Part
(USDA Soil Survey San Dimas PA1 Region)



Map Scale: 1:13,400 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Los Angeles County, California, Southeastern Part
Survey Area Data: Version 8, Sep 13, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 5, 2020—Feb 6, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1007	Urban land-Biscailuz-Pico complex, 0 to 2 percent slopes	61.3	7.4%
1138	Urban land-Azuvina-Montebello complex, 0 to 5 percent slopes	9.1	1.1%
1141	Zaca-Apollo, warm complex, 20 to 55 percent slopes	387.5	46.9%
1232	Counterfeit-Urban land complex, 10 to 35 percent slopes, terraced	368.4	44.6%
Totals for Area of Interest		**826.3**	**100.0%**

APPENDIX B2

USDA NRCS Soil Description of Zaca-Apollo Complex

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Los Angeles County, California, Southeastern Part

1141—Zaca-Apollo, warm complex, 20 to 55 percent slopes

Map Unit Setting

National map unit symbol: 2pt45
Elevation: 220 to 1,630 feet
Mean annual precipitation: 14 to 21 inches
Mean annual air temperature: 64 to 66 degrees F
Frost-free period: 355 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Zaca and similar soils: 50 percent
Apollo, warm, and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Zaca

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Colluvium and/or residuum weathered from sandstone and siltstone

Typical profile

A - 0 to 8 inches: clay
Bkss1 - 8 to 21 inches: clay
Bkss2 - 21 to 37 inches: clay
Bk - 37 to 53 inches: clay
Cr - 53 to 63 inches: bedrock

Properties and qualities

Slope: 20 to 55 percent
Depth to restrictive feature: 37 to 69 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Apollo, Warm

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Colluvium and/or residuum weathered from sandstone and siltstone

Typical profile

A - 0 to 4 inches: clay loam
Btk1 - 4 to 11 inches: clay loam
Btk2 - 11 to 26 inches: clay loam
Bk - 26 to 45 inches: clay loam
Cr - 45 to 55 inches: bedrock

Properties and qualities

Slope: 20 to 55 percent
Depth to restrictive feature: 31 to 55 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Boades

Percent of map unit: 8 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Balcom

Percent of map unit: 7 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Hydric soil rating: No

Data Source Information

Soil Survey Area: Los Angeles County, California, Southeastern Part
Survey Area Data: Version 8, Sep 13, 2021