Appendix IS-3

Water Resources Report

HYDROLOGY & WATER RESOURCES TECHNICAL REPORT

for

130 W College Street
Los Angeles, CA

Prepared For:

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Langan Project No. 721036101

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TABLE OF CONTENTS

Section **Page No.**

FIGURES

APPENDICES

1.0 INTRODUCTION

1.1 **Project Description**

S&R Partners, LLC (Applicant) is the owner of the property located at 130, 114, 130 West College Street, 117, 119 West Bruno Street, and 973, 971, 963, 959, 955, 953, 949, 945, 943 North Main Street (the Property) in the City of Los Angeles (the City). The Property is associated with Los Angeles County Assessor Parcel Nos. 5409-008-001, 002, 003, 004, 005, 006, and 015. The Property is bounded by Alameda Street to the west, College Street to the north, Main Street to the east, and Bruno Street to the south. The Property contains approximately 96,268 square feet of net lot area (or approximately 2.21 acres) and is currently occupied by a paved parking lot for buses. Applicant intends to develop the Property with a creative workplace that will consist of a podium with one level of at-grade parking and one level of above-grade parking (both podium levels would be wrapped with active ground floor commercial uses along the Alameda Street, Bruno Street, and Main Street frontages), and four (4) levels of office uses above, and one level of subterranean parking (the Project). The Project is described in more detail below.

1.2 **Scope of Work**

This technical study provides a description of the existing surface water hydrology, surface water quality, groundwater level and quality at the Property and analyzes the Project's potential impacts related to surface water hydrology, surface water quality and groundwater quality.

2.0 REGULATORY FRAMEWORK

2.1 **Surface Water Hydrology**

<u>Los Angeles County Hydrology Manual</u>
The Los Angeles County (County) Hydrology Manual requires that storm drain conveyance systems be designed for a 25-year storm event and that the combined capacity of the storm drain and street flow system have capacity for flow from a 50-year storm event.

The County also limits the allowable storm flow into existing storm drain facilities based on the municipal separate storm sewer systems (MS4) Permit which is applicable to all new developments that discharge directly into the County's storm drain system. Any proposed drainage improvements of County owned storm drain facilities such as catch basins and storm drain lines require approval and review from the County Flood Control District.

<u>Los Angeles Municipal Code</u>
Any proposed drainage improvement within the right-of-way or any other property owned or under the control of the City requires the approval of a B-permit (Section

62.105, Los Angeles Municipal Code (LAMC)). Under the B-permit process, storm drain installation plans are subject to review and approval by the City's Department of Public Works, Bureau of Engineering (Bureau of Engineering). Additionally, any connections to the City's storm drain system from a private property to a City catch basin or an underground storm drain pipe requires a storm drain connection permit from Bureau of Engineering.

2.2 **Surface Water Quality**

<u>Federal Clean Water Act</u>
The Federal Clean Water Act (CWA) authorizes Federal, state, and local entities to cooperatively create comprehensive programs for eliminating or reducing the pollution of state waters and tributaries. The primary goals of the CWA are to restore and maintain the chemical, physical, and biological integrity of the nation's waters and to make all surface waters fishable and swimmable. As such, the CWA forms the basic national framework for the management of water quality and the control of pollutant discharges. The CWA also sets forth a number of objectives in order to achieve the above-mentioned goals. These objectives include regulating pollutant and toxic pollutant discharges; providing for water quality that protects and fosters the propagation of fish, shellfish and wildlife; developing waste treatment management plans; and developing and implementing programs for the control of non-point sources of pollution.

Since its introduction, major amendments to the CWA have been enacted (e.g., 1961, 1966, 1970, 1972, 1977, and 1987). Amendments enacted in 1970 created the United States Environmental Protection Agency (USEPA), while amendments enacted in 1972 deemed the discharge of pollutants into waters of the United States from any point source unlawful unless authorized by a USEPA National Pollutant Discharge Elimination System (NPDES) permit. Amendments enacted in 1977 mandated development of a "Best Management Practices" Program at the state level and provided the Water Pollution Control Act with the common name of "Clean Water Act," which is universally used today. Amendments enacted in 1987 required the USEPA to create specific requirements for discharges. In response to the 1987 amendments to the CWA and as part of Phase I of its NPDES permit program, the USEPA began requiring NPDES permits for: (1) municipal separate storm sewer systems (MS4) generally serving, or located in, incorporated cities with 100,000 or more people (referred to as municipal permits); (2) 11 specific categories of industrial activity (including landfills); and (3) construction activity that disturbs five acres or more of land. Phase II of the USEPA's NPDES permit program, which went into effect in early 2003, extended the requirements for NPDES permits to: (1) numerous small municipal separate storm sewer systems, (2) construction sites of one to five acres, and (3) industrial facilities owned or operated by small municipal separate storm sewer systems. The NPDES permit program is typically administered by individual authorized states.

In 2008, the USEPA published draft Effluent Limitation Guidelines (ELGs) for the construction and development industry. On December 1, 2009 the USEPA finalized its 2008 Effluent Guidelines Program Plan. In California, the NPDES stormwater permitting program is administered by the State Water Resources Control Board (SWRCB). The SWRCB was created by the California Legislature in 1967. The joint authority of water distribution and water quality protection allows the SWRCB to provide protection for the State's waters, through its nine Regional Water Quality Control Boards (RWQCBs). The RWQCBs develop and enforce water quality objectives and implement plans that will best protect California's waters, acknowledging areas of different climate, topography, geology, and hydrology. The RWQCBs develop "basin plans" for their hydrologic areas, issue waste discharge requirements, enforce action against stormwater discharge violators, and monitor water quality.

Federal Anti-Degradation Policy

The Federal Anti-degradation Policy (40 Code of Federal Regulations [(CFR)] 131.12) requires states to develop statewide anti-degradation policies and identify methods for implementing them. Pursuant to the CFR, state anti-degradation policies and implementation methods shall, at a minimum, protect and maintain (1) existing in-stream water uses; (2) existing water quality, where the quality of the waters exceeds levels necessary to support existing beneficial uses, unless the state finds that allowing lower water quality is necessary to accommodate economic and social development in the area; and (3) water quality in waters considered an outstanding national resource.

California Porter-Cologne Act

The California Porter-Cologne Water Quality Control Act established the legal and regulatory framework for California's water quality control. The California Water Code (CWC) authorizes the SWRCB to implement the provisions of the CWA, including the authority to regulate waste disposal and require cleanup of discharges of hazardous materials and other pollutants.

Under the CWC, the State of California is divided into nine RWQCBs, governing the implementation and enforcement of the CWC and CWA. The Property is located within Region 4, also known as the Los Angeles Region. Each RWQCB is required to formulate and adopt a Basin Plan for its region, and must adhere to the policies set forth in the CWC and established by the SWRCB. The RWQCB is also given authority to include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

California Anti-Degradation Policy

The California Anti-degradation Policy, otherwise known as the Statement of Policy with Respect to Maintaining High Quality Water in California was adopted by the SWRCB (State Board Resolution No. 68-16) in 1968. Unlike the Federal Anti-degradation Policy, the California Anti-degradation Policy applies to all waters of the State, not just surface waters. The policy states that whenever the existing quality of a water body is better than the quality established in individual Basin Plans, such high quality shall be maintained and discharges to that water body shall not unreasonably affect present or anticipated beneficial use of such water resource.

California Toxic Rule
In 2000, the USEPA promulgated the California Toxic Rule, which establishes water quality criteria for certain toxic substances to be applied to waters in the State. The USEPA promulgated this rule based on the USEPA's determination that the numeric criteria are necessary in the State to protect human health and the environment. The California Toxic Rule establishes acute (i.e., short-term) and chronic (i.e., long-term) standards for bodies of water such as inland surface waters and enclosed bays and estuaries that are designated by the Los Angeles RWQCB (LARWQCB) as having beneficial uses protective of aquatic life or human health.

Board Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties
As required by the CWC, in 1994 the LARWQCB adopted a plan entitled "Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal watersheds of Los Angeles and Ventura Counties" (Basin Plan). Specifically, the Basin Plan designates beneficial uses for surface and groundwaters, sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State's anti-degradation policy, and describes implementation programs to protect all waters in the Los Angeles Region. In addition, the Basin Plan incorporates (by reference) all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. Those of other agencies are referenced in appropriate sections throughout the Basin Plan.

The Basin Plan is a resource for the LARWQCB and others who use water and/or discharge wastewater in the Los Angeles Region. Other agencies and organizations involved in environmental permitting and resource management activities also use the Basin Plan. Finally, the Basin Plan provides valuable information to the public about local water quality issues.

NPDES Permit Program
The NPDES permit program was first established under authority of the CWA to control the discharge of pollutants from any point source into the waters of the United States. As indicated above, in California, the NPDES stormwater permitting program is administered by the SWRCB through its nine RWQCBs.

The General Permit
SWRCB Order No. 2012-0006-DWQ known as "The General Permit" was adopted on July 17, 2012. This NPDES permit establishes a risk-based approach to stormwater control requirements for construction projects by identifying three project risk levels. The main objectives of the General Permit are to:

1. Reduce erosion;

2. Minimize or eliminate sediment in stormwater discharges;

3. Prevent materials used at a construction site from contacting stormwater;

4. Implement a sampling and analysis program;

5. Eliminate unauthorized non-stormwater discharges from construction sites;

6. Implement appropriate measures to reduce potential impacts on waterways both during and after construction of projects; and

7. Establish maintenance commitments on post-construction pollution control measures.

California mandates all construction activities disturbing more than one acre of land to develop and implement Stormwater Pollution Prevention Plans (SWPPP). The SWPPP documents the selection and implementation of Best Management Practices (BMPs) for a specific construction project, charging owners with stormwater quality management responsibilities. A construction site subject to the General Permit must prepare and implement a SWPPP that meets the requirements of the General Permit.

Los Angeles County Municipal Storm Water System (MS4) Permit

As described above, USEPA regulations require that MS4 permittees implement a program to monitor and control pollutants being discharged to the municipal system from both industrial and commercial projects that contribute a substantial pollutant load to the MS4. On November 8, 2012, the LARWQCB adopted Order No. R4-2012-0175 under the CWA and the Porter-Cologne Act, which is the NPDES permit or MS4 permit for municipal stormwater and urban runoff discharges within the County (Permit). The Permit covers 84 cities and most of the unincorporated areas of Los Angeles County. Under the Permit, the Los Angeles County Flood Control District (LACFCD) is designated as the Principal Permittee. The Permittees are the 84 Los Angeles County cities (including the City of Los Angeles) and Los Angeles County. Collectively, these are the "Co-Permittees". The Principal Permittee helps to facilitate activities necessary to comply with the requirements outlined in the Permit but is not responsible for ensuring compliance of any of the Permittees.

Stormwater Quality Management Program (SQMP)

In compliance with the Permit, the Co-Permittees are required to implement a stormwater quality management program (SQMP) with the goal of accomplishing the requirements of the Permit and reducing the amount of pollutants in stormwater runoff. The SWMP requires the County of Los Angeles and the 84 incorporated cities to:

- Implement a public information and participation program to conduct outreach on storm water pollution;

- Control discharges at commercial/industrial facilities through tracking, inspecting, and ensuring compliance at facilities that are critical sources of pollutants;

- Implement a development planning program for specified development Projects;

- Implement a program to control construction runoff from construction activity at all construction sites within the relevant jurisdictions;

- Implement a public agency activities program to minimize storm water pollution impacts from public agency activities; and

- Implement a program to document, track, and report illicit connections and discharges to the storm drain system.

The Permit contains the following provisions for implementation of the SQMP by the Co-Permittees:

1. General Requirements:

    - Each permittee is required to implement the SQMP in order to comply with applicable stormwater program requirements.

    - The SQMP shall be implemented and each permittee shall implement additional controls so that discharge of pollutants is reduced.

2. Best Management Practice Implementation:
    - Permittees are required to implement the most effective combination of BMPs for stormwater/urban runoff pollution control. This should result in the reduction of storm water runoff.

3. Revision of the SQMP:

    - Permittees are required to revise the SQMP in order to comply with requirements of the RWQCB while complying with regional watershed requirements and/or waste load allocations for implementation of Total Maximum Daily Loads (TMDLs) for impaired waterbodies.

4. Designation and Responsibilities of the Principal Permittee:

The Los Angeles County Flood Control District is designated as the Principal Permittee who is responsible for:

- Coordinating activities that comply with requirements outlined in the NPDES Permit;

- Coordinating activities among Permittees;

- Providing personnel and fiscal resources for necessary updates to the SQMP;

- Providing technical support for committees required to implement the SQMP; and

- Implementing the Countywide Monitoring Program required under this Order and assessing the results of the monitoring program.

5. Responsibilities of Co-Permittees:
Each Co-Permittee is required to comply with the requirements of the SQMP as applicable to the discharges within its geographical boundaries. These requirements include:

- Coordinating among internal departments to facilitate the implementation of the SQMP requirements in an efficient way;

- Participating in coordination with other internal agencies as necessary to successfully implement the requirements of the SQMP; and

- Preparing an annual Budget Summary of expenditures for the storm water management program by providing an estimated breakdown of expenditures for different areas of concern, including budget projections for the following year.

6. Watershed Management Committees (WMCs):

- Each WMC shall be comprised of a voting representative from each Permittee in the Watershed Management Area (WMA).
- Each WMC is required to facilitate exchange of information between co-permittees, establish goals and deadlines for WMAs, prioritize pollution control measures, develop and update adequate information, and recommend appropriate revisions to the SQMP.

7. Legal Authority:

- Co-Permittees are granted the legal authority to prohibit non-storm water discharges to the storm drain system including discharge to the MS4 from various development types.

<u>City of Los Angeles Water Quality Compliance Master Plan for Urban Runoff</u>
The City of Los Angeles Water Quality Compliance Master Plan for Urban Runoff (WQCMP), adopted by the City's Board of Public Works in April 2009, was developed by the City's Bureau of Sanitation, Watershed Protection Division in collaboration with stakeholders as a strategy to comply with current and emerging water quality regulations.

Implementation of the WQCMP was intended over a 20 to 30 year period post-adoption to result in cleaner neighborhoods, rivers, lakes and bays, augmented local water supply, reduced flood risk, more open space, and beaches that are safe for swimming. The WQCMP also supports the Mayor and City Council's efforts to make Los Angeles the greenest major city in the nation.

The WQCMP identifies and describes the various watersheds in the City, summarizes the water quality conditions of the City's waters, identifies known sources of pollutants, describes the governing regulations for water quality, describes the BMPs that are being implemented by the City, discusses existing Total Maximum Daily Load (TMDL) Implementation Plans and Watershed Management Plans. Additionally, the WQCMP provides an implementation strategy that includes the following three initiatives to achieve water quality goals:

- Water Quality Management Initiative, which describes how Water Quality Management Plans for each of the City's watershed and TMDL-specific Implementation Plans will be developed to ensure compliance with water quality regulations.

- The Citywide Collaboration Initiative, which recognizes that urban runoff management and urban (re)development are closely linked, requiring collaborations of many City agencies. This initiative requires the development of City policies, guidelines, and ordinances for green and sustainable approaches for urban runoff management.

- The Outreach Initiative, which promotes public education and community engagement with a focus on preventing urban runoff pollution.

- The Water Quality Compliance Master Plan for Urban Runoff includes a financial plan that provides a review of current sources of revenue, estimates costs for water quality compliance, and identifies new potential sources of revenue.

<u>City of Los Angeles Stormwater Program</u>
The City supports the policies of the General Permit and the Los Angeles County NPDES permit through the Stormwater Low Impact Development Ordinance (LID Ordinance) and the Planning and Land Development Handbook for Low Impact Development (LID Handbook). The City adopted the Stormwater LID Ordinance (Ordinance 181899) in November 2011, which was updated in September 2015 (Ordinance 183833) with the purpose of:

- Requiring the use of Low Impact Development (LID) standards and practices in future developments and redevelopments to encourage the beneficial use of rainwater and urban runoff;
- Reducing stormwater/urban runoff while improving water quality;
- Promoting rainwater harvesting;

- Reducing offsite runoff and providing increased groundwater recharge;
- Reducing erosion and hydrologic impacts downstream; and
- Enhancing the recreational and aesthetic values in our community.

The LID Ordinance requires LID measures to be incorporated into the design of all development and redevelopment projects that have a land disturbance activity and add, create or replace 500 square feet or more of impervious area.

The City, Board of Public Works adopted the LID Handbook, Part B, Planning Activities, 5th Edition in May 2016 (Ordinance 183833). The LID Handbook provides guidance for developers in complying with the requirements of the Development Planning Program regulations of the City's Stormwater Program. The LID Handbook provides specific site design approaches and BMPs that promote the use of natural systems for infiltration, evapotranspiration, and use of stormwater. These LID practices can effectively remove nutrients, bacteria and metals from stormwater while reducing the volume and intensity of stormwater flows.

The City implements the requirements to mitigate stormwater quality impacts through the City's plan review and approval process. Plans and specifications are reviewed to ensure that the appropriate BMPs are incorporated to address stormwater pollution prevention goals.

All new development and redevelopment projects that are not considered small-scale residential development projects shall comply with the following requirements:

- Stormwater runoff must be infiltrated, evapotranspired, captured and used, and/or treated through high removal efficiency BMPs onsite, through stormwater management techniques as identified in the LID Handbook.
- The onsite stormwater management techniques must be properly sized, at a minimum, to infiltrate, evapotranspire, store for use, and/or treat through a high removal efficiency biofiltration/biotreatment system, without any stormwater runoff leaving the site to the maximum extent feasible, for at least the volume of water produced by the stormwater quality design storm event that results from:
    - The 0.75-inch, 24-hour rain event, or
    - The 85th percentile 24-hour runoff event determined from the Los Angeles County 85th percentile precipitation isohyetal map, whichever is greater.

The handbook and ordinances also have specific minimum BMP requirements for all construction activities and require dischargers whose construction Projects disturb one acre or more of soil to prepare a Stormwater Pollution Prevention Plan (SWPPP) and file a Notice of Intent (NOI) with the SWRCB. The NOI informs the SWRCB of a particular Project and results in the issuance of a Waste Discharger Identification (WDID) number, which is needed to demonstrate compliance with the General Permit.

<u>Los Angeles Municipal Code</u>

Section 64.70 of the LAMC sets forth the City's Stormwater and Urban Runoff Pollution Control Ordinance (Ordinance). The Ordinance prohibits the discharge of the following into any storm drain system:

- Any liquids, solids, or gases which by reason of their nature or quantity are flammable, reactive, explosive, corrosive, or radioactive, or by interaction with other materials could result in fire, explosion or injury.
- Any solid or viscous materials, which could cause obstruction to the flow or operation of the storm drain system.
- Any pollutant that injures or constitutes a hazard to human, animal, plant, or fish life, or creates a public nuisance.
- Any noxious or malodorous liquid, gas, or solid in sufficient quantity, either singly or by interaction with other materials, which creates a public nuisance, hazard to life, or inhibits authorized entry of any person into the storm drain system.
- Any medical, infectious, toxic or hazardous material or waste.

Additionally, unless otherwise permitted by a NPDES permit, the Ordinance prohibits industrial and commercial developments from discharging untreated wastewater or untreated runoff into the storm drain system. Furthermore, the Ordinance prohibits trash or any other abandoned objects/materials from being deposited such that they could be carried into the storm drains. Lastly, the Ordinance not only makes it a crime to discharge pollutants into the storm drain system and imposes fines on violators, but also gives City public officers the authority to issue citations or arrest business owners or residents who deliberately and knowingly dump or discharge hazardous chemicals or debris into the storm drain system.

Earthwork activities, including grading, are governed by the Los Angeles Building Code, which is contained in LAMC, Chapter IX, Article 1. Specifically, Section 91.7013 includes regulations pertaining to erosion control and drainage devices, and Section 91.7014 includes general construction requirements, as well as requirements regarding flood and mudflow protection.

2.3 **Groundwater**

Board Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties

As required by the CWC, the LARWQCB adopted the Basin Plan. Specifically, the Basin Plan designates beneficial uses for surface and groundwaters, sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State's anti-degradation policy, and describes implementation programs to protect all waters in the Los Angeles Region. In addition, the Basin Plan incorporates (by reference) all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. Those of other agencies are referenced in appropriate sections throughout the Basin Plan.

The Basin Plan is a resource for the LARWQCB and others who use water and/or discharge wastewater in the Los Angeles Region. Other agencies and organizations involved in environmental permitting and resource management activities also use the Basin Plan. Finally, the Basin Plan provides valuable information to the public about local water quality issues.

Safe Drinking Water Act (SDWA)
The Federal Safe Drinking Act, established in 1974, sets drinking water standards throughout the country and is administered by the USEPA. The drinking water standards established in the SDWA, as set forth in the CFR, are referred to as the National Primary Drinking Water Regulations (Primary Standards, Title 40, CFR Part 141) and the National Secondary Drinking Water Regulations (Second Standards, 40 CFR Part 143). California passed its own Safe Drinking Water Act in 1986 that authorizes the State's Department of Health Services (DHS) to protect the public from contaminants in drinking water by establishing maximum contaminants levels (MCLs), as set forth in the CCR, Title 22, Division 4, Chapter 15, that are at least as stringent as those developed by the USEPA, as required by the SDWA.

California Water Plan
The California Water Plan (the Plan) provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The Plan, which is updated every five years, presents basic data and information on California's water resources including water supply evaluations and assessments of agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses. The Plan also identifies and evaluates existing and proposed statewide demand management and water supply augmentation programs and Projects to address the State's water needs.

The goal for the California Water Plan Update is to meet Water Code requirements, receive broad support among those participating in California's water planning, and be a useful document for the public, water planners throughout the state, legislators and other decision-makers.

3.0 ENVIRONMENTAL SETTING

3.1 Surface Water Hydrology

The Property is located within the Chinatown of the City, bounded by Alameda Street to the west, College Street to the north, Main Street to the east, and Bruno Street to the south. The Property is within the Los Angeles River Watershed in the Los Angeles Central Basin. Refer to Appendix A for the Property location within the Los Angeles River Watershed Map.

The streets surrounding the Property contain an existing catch basin and underground storm drain pipes. In the existing condition, stormwater drainage from the site will sheet flow mainly from north to south onto Alameda Street and Bruno Street. Stormwater

drainage from the Property will also sheet flow onto College Street and Main Street. The drainage will ultimately discharge into an existing catch basin located at the southwest corner of the Property, where it connects into an existing 66-inch RCP storm drain system that flows south on Alameda Street. See Figure 1 for existing on-site drainage pattern and Appendix D for the existing hydrology calculations.
Table 1 below shows the existing volumetric flow rate generated by the 50-year storm event.

Table 1. Existing Drainage Stormwater 50-Year Volume

Subarea ID	Area (Acres)	Q_{50} (cfs)
A1	0.50	1.64
A2	0.99	3.24
A3	0.24	0.79
A4	0.48	1.57
TOTAL	**2.21**	**7.24**

3.2 **Surface Water Quality**

The runoff from the Project Site discharges to the Los Angeles River Reach 2. Constituents of concern listed for Los Angeles River Reach 2 under California's CWA Section 303(d) List includes trash, nutrients (algae), ammonia, indicator bacteria, oil, copper, and lead. Listed pollutants with TMDL include trash, nutrients (algae), ammonia, indicator bacteria, copper, and lead. Urban stormwater runoff occurs following precipitation events, with the volume of runoff flowing into the drainage system depending on the intensity and duration of the rain event. Contaminants such as sediments, trash, bacteria, metals, nutrients, organics and pesticides from the surface and air may be carried by rainfall runoff into drainage systems. Therefore, the City has put in place catch basins with screens to capture debris before entering the storm drain system.

The existing Property is currently developed as a parking lot for buses. Based on the existing Property conditions , it is presumed the Property currently does not implement Best Management Practices (BMPs). The runoff currently within the Property is captured by the existing catch basin on Alameda Street. The runoff water does not get treated on site before discharging to the main storm drain facility. See Figure 1 for the existing drainage exhibit.

3.3 Groundwater Hydrology

The Property is located within the northeastern portion of the Central Basin groundwater basin. Based on field investigations conducted by Langan Engineering, in

October 2022, groundwater was encountered at a depth between approximately 24 to 27 feet. Based on Langan Engineering's review of the "Seismic Hazard Zone Report for the Los Angeles 7.5-Minute Quadrangle, Los Angeles County, California" by the CGS, the historical high groundwater depth at the Property is approximately 20 feet. The entire Property is impervious, consisting entirely of existing paved surfaces. Given the perviousness of the Property and the existing drainage patterns, the Property does not currently have any significant impact to groundwater. See Appendix B for the Property location within the Central Basin.

3.4 **Groundwater Quality**

The Property falls under the LARWQCB's jurisdiction. Based on LARWQCB's Basin Plan, constituents of concern listed for the Central Basin include boron, chloride, sulfate, and Total Dissolved Solids (TDS). With existing paved areas, the Property is currently 100% impervious. Given the imperviousness, the depth of existing groundwater, and the existing flow direction, it is unlikely that the Property contributes significantly to groundwater recharge. The Property does not significantly contribute to groundwater pollution or otherwise significantly adversely impact groundwater quality.

4.0 SIGNIFICANCE THRESHOLDS

4.1 Surface Water Hydrology

Appendix G of the State of California's CEQA Guidelines provides a set of sample questions that address impacts with regard to surface water hydrology. These questions are as follows:

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 or through the addition of impervious surfaces, in a manner which would:
    - Result in a substantial erosion or siltation on- or off-site;
    - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
    - 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
    - Impede or redirect flood flows?

In the context of these questions from Appendix G of the CEQA Guidelines, the City's CEQA Thresholds Guide (L.A. CEQA Thresholds Guide) states that a project would normally have a significant impact on surface water hydrology if it would:

- Cause flooding during the Projected 50-year developed storm event, which would have the potential to harm people or damage property or sensitive biological resources;

- Substantially reduce or increase the amount of surface water in a water body; or

- Result in a permanent, adverse change to the movement of surface water sufficient to produce a substantial change in the current or direction of water flow.

4.2 **Surface Water Quality**

Appendix G of the CEQA Guidelines provides a set of sample questions that address impacts with regard to surface water quality. These questions are as follows:

Would the project:

- Violate any water quality standard or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

In the context of the above questions from Appendix G, the L.A. CEQA Thresholds Guide states that a project would normally have a significant impact on surface water quality if it would result in discharges that would create pollution, contamination or nuisance, as defined in Section 13050 of the CWC or that cause regulatory standards to be violated, as defined in the applicable NPDES stormwater permit or Water Quality Control Plan for the receiving water body.

The CWC includes the following definitions:

- "Pollution" means an alteration of the quality of the waters of the state to a degree which unreasonably affects either of the following: 1) the waters for beneficial uses or 2) facilities which serve these beneficial uses. "Pollution" may include "Contamination".

- "Contamination" means an impairment of the quality of the waters of the state by waste to a degree, which creates a hazard to the public health through poisoning or though the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.

- "Nuisance" means anything which meets all of the following requirements: 1) is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property; 2) affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and 3) occurs during, or as a result of, the treatment or disposal of wastes.

4.3 Groundwater Hydrology

Appendix G of the CEQA Guidelines provides a sample question that addresses impacts with regard to groundwater. This question is as follows:

Would the project:

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;

- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

In the context of the above question from Appendix G, the *L.A. CEQA Thresholds Guide* states that a project would normally have a significant impact on groundwater if it would:

- Change potable water levels sufficiently to:

    - Reduce the ability of a water utility to use the groundwater basin for public water supplies, conjunctive use purposes, storage of imported water, summer/winter peaking, or to respond to emergencies and drought;

    - Reduce yields of adjacent wells or well fields (public or private); or

    - Adversely change the rate or direction of flow of groundwater; or

- Result in demonstrable and sustained reduction of groundwater recharge capacity.

4.4 Groundwater Quality

With respect to groundwater quality, and in the context of the above question from Appendix G pertaining to groundwater, the L.A. CEQA Thresholds Guide states that a project would normally have a significant impact on groundwater quality if it would:

- Affect the rate or change the direction of movement of existing contaminants;
- Expand the area affected by contaminants;
- Result in an increased level of groundwater contamination (including that from direct percolation, injection or salt water intrusion); or
- Cause regulatory water quality standards at an existing production well to be violated, as defined in the CCR, Title 22, Division 4, and Chapter 15 and in the SDWA.

5.0 METHODOLOGY

5.1 Surface Water Hydrology

The Property is located within the City, and all drainage collection, treatment and conveyance are regulated by the City. Per the City's Special Order No. 007-1299, December 3, 1999, the City has adopted the Los Angeles County Department of Public Works (LACDPW) Hydrology Manual as its basis of design for storm drainage facilities. The LACDPW Hydrology Manual requires projects to have drainage facilities that meet the Urban Flood level of protection. The Urban Flood is runoff from a 25-year frequency design storm falling on a saturated watershed. A 25-year frequency design storm has a probability of 1/25 of being equaled or exceeded in any year. The L.A. CEQA Thresholds Guide, however, establishes the 50-year frequency design storm event as the threshold to analyze potential impacts on surface water hydrology as a result of development. To provide a more conservative analysis, this report analyzes the larger storm event threshold, i.e., the 50-year frequency design storm event.

The Modified Rational Method was used to calculate storm water runoff. The "peak" (maximum value) runoff for a drainage area is calculated using the formula, **Q = CIA**

Where,
Q = Volumetric flow rate (cfs)
C = Runoff coefficient (dimensionless)
I = Rainfall Intensity at a given point in time (in/hr)
A = Basin area (acres)

The Modified Rational Method assumes that a steady, uniform rainfall rate will produce maximum runoff when all parts of the basin area are contributing to outflow. This occurs when the storm event lasts longer than the time of concentration. The time of concentration (Tc) is the time it takes for rain in the most hydrologically remote part of the basin area to reach the outlet.

The method assumes that the runoff coefficient (C) remains constant during a storm. The runoff coefficient is a function of both the soil characteristics and the percentage of impervious surfaces in the drainage area.

LACDPW has developed a time of concentration calculator, Hydrocalc, to automate time of concentration calculations as well as the peak runoff rates and volumes using the Modified Rational Method design criteria as outlined in the Hydrology Manual. The data input requirements include: sub-area size, soil type, land use, flow path length, flow path slope and rainfall isohyet. The Hydrocalc Calculator was used to calculate the storm water peak runoff flow rate for the Project conditions by evaluating an individual sub-area independent of all adjacent subareas. See Appendix E for the Hydrocalc Calculator results and Appendix C for the Isohyet Map.

5.2 Surface Water Quality

Construction BMPs will be designed and maintained as part of the implementation of the SWPPP in compliance with the General Permit. The SWPPP shall begin when construction commences, before any site clearing and grubbing or demolition activity. During construction, the SWPPP will be referred to regularly and amended as changes occur throughout the construction process. The NOI, Amendments to the SWPPP, Annual Reports, Rain Event Action Plans (REAPs), and Non-Compliance Reporting will be posted to the State's SMARTS website in compliance with the requirements of the General Permit.

The Project will meet the requirements of the City's LID standards. Under section 3.1.3. of the LID manual, post-construction stormwater runoff from a new development must be infiltrated, evapotranspirated, captured and used, and/or treated through high efficiency BMPs onsite for at least the volume of water produced by the greater of the 85th percentile storm or the 0.75 inch storm event. The LID Manual prioritized the selection of BMPs used to comply with stormwater mitigation requirement. The order of priority is:

1. Infiltration Systems
2. Stormwater Capture and Use
3. High Efficient Biofiltration/Bioretention Systems
4. Combination of Any of the Above

Feasibility screening delineated in the LID manual is applied to determine which BMP will best suit the Project.

Per the Preliminary Geotechnical Investigation Report for Creative Workplace Development, 130 West College, Los Angeles, California prepared by Langan Engineering and Environmental Services, Inc., dated February 17, 2023, the Property is located within a liquefaction hazard zone with a historic high groundwater level at approximately 20 feet below the ground surface. In addition, groundwater was observed at a depth between approximately 24 to 27 feet below ground surface. Therefore, infiltration is determined to not be feasible. To meet LID requirements, the Project will be collecting the runoff from the Property for reuse in supplementing the irrigation demand. The Project will convey runoff to two pre-treatment devices and below-grade storage tanks.

Per the LID manual, capture and use BMPs require the Estimated Total Water Usage (ETWU) for irrigation from October 1 to April 30 must be greater than or equal to the volume of the water produced by the stormwater quality design storm event. If the volume of captured stormwater exceeds the Estimated Total Water Use for the rain season ($ETQU_7$), excess stormwater shall, at a minimum establish a schedule to release captured stormwater over landscaping as determined in section 4.5.2. In addition, LID guidelines require that human health concerns should be prioritized, particularly with regards to vector control issues arising from the addition of standing water on site. See Appendix G for LID calculations.

5.3 Groundwater Quality

The significance of this Project as it relates to the level of the underlying groundwater table of the Central Basin Groundwater Basin included a review of the following considerations:

Analysis and Description of the Project's Existing Condition

- Identification of the Central Basin as the underlying groundwater basin, and description of the level, quality, direction of flow, and existing uses for the water;

- Description of the location, existing uses, production capacity, quality, and other pertinent data for spreading grounds and potable water wells in the vicinity (usually within a one-mile radius), and;

- Area and degree of permeability of soils on the Property, and;

Analysis of the Project Impact on Groundwater Level

- Description of the rate, duration, location and quantity of extraction, dewatering, spreading, injection, or other activities;

- The projected reduction in groundwater resources and any existing wells in the vicinity (usually within a one-mile radius); and

- The projected change in local or regional groundwater flow patterns.

In addition, this report discusses the impact of both existing and proposed activities at the Property on the groundwater quality of the underlying Central Basin.

Short-term groundwater quality impacts could potentially occur during Project construction as a result of soil or shallow groundwater being exposed to construction materials, wastes, and spilled materials. These potential impacts are quantitatively assessed.

6.0 PROJECT IMPACT ANALYSIS

6.1 Construction

6.1.1 Surface Water Hydrology

Applicant intends to develop the Property with the Project. Project construction activities include site clearing and excavating up to 17-ft below grade for the proposed subterranean garage level.

It is anticipated that approximately 67,686 cubic yards of soil would need to be exported as a result of the Project. These construction activities will temporarily expose the underlying soils and may make the Property temporarily more permeable. Also, exposed and stockpiled soils could be subject to wind and conveyance into nearby storm drains during storm events. In addition, on-site watering activities to reduce airborne dust could contribute to pollutant loading in runoff.

However, as the Property is greater than one acre, the Project would be required to obtain coverage under the NPDES Construction General Permit. In accordance with the requirements of this permit, the Project would implement a SWPPP that specifies BMPs and erosion control measures to be used during construction to manage runoff flows and prevent pollution. BMPs would be designed to reduce runoff and pollutant levels in runoff during construction. The NPDES and SWPPP measures are designed to and would contain and treat, as necessary, stormwater or construction watering on the Property so runoff does not impact off-site drainage facilities or receiving waters. Construction activities are temporary and flow directions and runoff volumes during construction will be controlled.

In addition, the Project will comply with all applicable City grading permit regulations, plans, and inspections to reduce sedimentation and erosion. Thus, through compliance with NPDES Construction General Permit requirements, implementation of BMPs, and compliance with applicable City grading regulations, the Project would not substantially alter the Property drainage patterns in a manner that would result in substantial erosion or siltation. The Project would not result in a permanent adverse change to the movement of surface water. **Therefore, the Project's construction-related impacts to surface water hydrology would be less than significant.**

6.1.2 **Surface Water Quality**

Construction activities such as earth moving, maintenance of construction equipment, handling of construction materials, and dewatering, can contribute to pollutant loading in stormwater runoff.

However, construction contractors disturbing greater than one acre of soil are required to obtain coverage under the NPDES Construction General Permit (order No. 2012-0006-DWQ). In accordance with the requirements of the permit, the Applicant would prepare and implement a site-specific SWPPP adhering to the California Stormwater Quality Association (CASQA) BMP Handbook. The SWPPP would specify BMPs to be used during construction. BMPs would include but not be limited to: erosion control, sediment control, non-stormwater management, and materials management BMPs. Refer to Appendix H for typical SWPPP BMPs to be implemented during Project construction.

With implementation of the Erosion Control Plan, site-specific BMPs would reduce or eliminate the discharge of potential pollutants from stormwater runoff. In addition, the Applicant would be required to comply with City grading permit regulations and inspections to reduce sedimentation and erosion. Construction of the Project would not result in discharge that would cause: (1) pollution which would alter the quality of the water of the State (i.e., Los Angeles River) to a degree which unreasonably affects beneficial uses of the waters; (2) contamination of the quality of the water of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of diseases; or (3) nuisance that would be injurious to health; affect an entire community or neighborhood, or any considerable number of persons; and occurs during or as a result of the treatment or disposal of wastes. Furthermore, construction of the Project would not result in discharges that would cause regulatory standards to be violated in the Los Angeles River Watershed. **Therefore, temporary Project construction-related impacts on surface water quality would be less than significant.**

6.1.3 **Groundwater Hydrology**

As stated in Section 6.1.1, Project construction activities would include excavating up to 17 feet for subterranean parking, building up the structure, and hardscape and landscape around the structure. As mentioned in Section 3.3, groundwater was observed at approximately 24 to 27 feet below ground surface. Historic high groundwater depth is reported at approximately 20 feet below ground surface. During Project construction, temporary dewatering would occur if required. The temporary system would comply with all relevant NPDES requirements related to construction and discharges from dewatering operations. Similar to the Construction General Permit, in order to be authorized to discharge under this Permit, the Applicant must submit an NOI to discharge groundwater generated from dewatering operations during construction. Due to the operation of dewatering systems being temporary, local groundwater hydrology in the immediate vicinity of the Property is minimally affected. The purpose of dewatering operations is for the protection of both existing and proposed building structures. Due to the limited and temporary nature of temporary dewatering operations, regional impacts to groundwater flow and level are not considered to be significant. **Therefore, as Project development would not adversely impact the rate or direction of flow of groundwater and no water supply wells would be affected, the Project would not result in a significant impact on groundwater hydrology during construction.**

6.1.4 **Groundwater Quality**

The Project would include excavations to a maximum depth of 17 feet below ground surface. The Project would also result in a net export of approximately 67,686 cubic yards of existing soil material. In the case that any contaminated soils are found during construction, the contaminated soils would be captured within that volume of excavated material, removed from the Property, and remediated at an approved disposal facility in accordance with LADBS Information Bulletin for Procedures When Hazardous and Contaminated Materials are Encountered During Construction or Geotechnical/Geological Exploration (Document No. P/BC 2020-131).

During on-site grading and building construction, hazardous materials, such as fuels, paints, solvents, and concrete additives, could be used and would therefore require proper management and, in some cases, disposal. The management of any resultant hazardous wastes could increase the opportunity for hazardous materials releases into groundwater. Compliance with all applicable federal, state, and local requirements concerning the handling, storage and disposal of hazardous waste, would reduce the potential for the construction of the Project to release contaminants into groundwater that could affect existing contaminants, expand the area or increase the level of groundwater contamination, or cause a violation of regulatory water quality standards at an existing production well. Due to compliance with the applicable regulatory requirements and with the implementation of BMPs, Project construction activities would not be anticipated to affect existing wells. **Therefore, Project construction would not result in any substantial increase in groundwater contamination through hazardous materials releases and impacts on groundwater quality would be less than significant.**

6.2 Operation

6.2.1 Surface Water Hydrology

The Project is expected to reduce the percentage of impervious area from the current condition of the Property because the Project will develop a building including subterranean parking and landscaped amenity spaces creating a post-Project condition of approximately 85% of impervious surface area. Due to LID requirements, the Project is required to provide at least the equivalent of 8% of the Property with landscaping or biofiltration planters for treating the runoff water. The Project will be collecting the runoff from the Property for reuse in supplementing the irrigation demand. The Project will convey runoff to two pre-treatment devices and below-grade storage tanks.

Based on the HydroCalc calculations, there will be a reduction in the total flow rates of the stormwater runoff for the 50-year frequency design storm event between the existing and proposed Property conditions. See Figure 2 for the proposed on-site drainage pattern and Appendix E for the proposed hydrology calculations.

Table 2.1 shows the proposed peak flow rates stormwater runoff calculations for the 50-year frequency design storm event.

Table 2.1 Proposed Drainage Stormwater 50-Year Flow

Subarea ID	Area (Acres)	Q_{50} (cfs)
A1	0.03	0.10
A2	0.07	0.23
A3	0.06	0.20
A4	0.10	0.33
A5	0.06	0.20
A6	0.04	0.13
A7	0.05	0.16
A8	0.16	0.51
A9	0.30	0.98
A10	0.40	1.30
A11	0.12	0.39
A12	0.12	0.39
A13	0.28	0.92
A14	0.39	1.27
TOTAL	**2.21**	**7.10**

Due to the reduction in impervious area from the existing Property conditions to the proposed Property conditions, the peak flow of the two conditions would decrease from 7.24 cfs to 7.10 cfs. As such, it is highly unlikely the Project would cause flooding during a 50-year storm event or result in an adverse change to the movement of surface water because it is capturing the runoff with surface drains and reducing the flow rate. **Therefore, the Project's operation-related impacts to surface water hydrology would be less than significant.**

6.2.2 **Surface Water Quality**

The Project will not increase concentrations of the items listed as constituents of concern for the Los Angeles River Watershed because it will capture and convey the runoff to two pre-treatment devices and storage tanks for reuse on the Property.

Under section 3.1.3. of the LID Manual, post-construction stormwater runoff from new Projects must be infiltrated, evapotranspirated, capture and used, and/or treated through high efficiency BMPs for the volume of water produced by the 85^{th} percentile storm event. The Project will convey runoff to two pre-treatment devices and storage tanks and reuse to supplement the irrigation demand in accordance with current LID requirements. See Appendix F for the 85^{th} percentile storm event of the proposed conditions and Appendix G for the LID calculations for capture and reuse.

Table 2.2 shows the proposed flow rates for the 85^{th} percentile storm event.

Table 2.2 Proposed Stormwater Quality Design Flow (85^{th} Percentile)

Subarea ID	Area (Acres)	Q_{85th} (cfs)
A1	0.03	0.01
A2	0.07	0.03
A3	0.06	0.03
A4	0.10	0.04
A5	0.06	0.03
A6	0.04	0.02
A7	0.05	0.02
A8	0.16	0.01
A9	0.30	0.10
A10	0.40	0.12
A11	0.12	0.04
A12	0.12	0.04
A13	0.28	0.10
A14	0.39	0.12
TOTAL	**2.21**	**0.70**

Operation of the Project would not result in discharges that would cause: (1) pollution which would alter the quality of the waters of the State (i.e., Los Angeles River) to a degree which unreasonably affects beneficial uses of the waters; (2) contamination of the quality of the waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of diseases; or (3) nuisance that would be injurious to health; affect an entire community or neighborhood, or any considerable number of persons; and occurs during or as a result of the treatment or disposal of wastes.

As is typical of most urban developments, stormwater runoff from the Property has the potential to introduce pollutants into the stormwater system. Anticipated and potential pollutants generated by the Project due to the urban setting include sediment, nutrients, pesticides, metals, pathogens, and oil and grease. However, the potential discharge of the aforementioned pollutants would be offset through the implementation of LID BMPs approved by the City.

The capture and reuse strategy (pre-treatment devices and storage tanks) will be implemented for stormwater mitigation, in compliance with LID BMP requirements, to control and treat stormwater runoff to mitigate the 85^{th} percentile storm event. The installed BMP systems will be designed with an internal bypass overflow system to prevent upstream flooding during major storm events. **Therefore, with implementation of LID BMPs, Project operational impacts on surface water quality would be less than significant.**

6.2.3 **Groundwater Hydrology**

The Project will develop hardscape and structures that cover approximately 85% of the Property with impervious surfaces and would not have any impact on the groundwater recharge potential since any runoff which bypasses the BMP systems would discharge to an approved discharge point in the public right-of-way and would not result in infiltration of a large amount of rainfall that would affect groundwater hydrology. Therefore, the Project’s operational impact on groundwater recharge would be less than significant.

6.2.4 **Groundwater Quality**

The Project does not include the installation of water wells, or any extraction or recharge system that is in the vicinity of the coast, an area of known groundwater contamination or seawater intrusion, a municipal supply well or spreading ground facility.

Operational activities which could typically affect groundwater quality include hazardous material spills and leaking underground storage tanks. However, Project operations do not include the use or storage of hazardous materials. Moreover, the Project does not involve drilling to or through a clean or contaminated aquifer. **Therefore, the Project's potential impact on groundwater recharge would be less than significant.**

6.3 Cumulative Impact Analysis

6.3.1 Surface Water Hydrology

The Los Angeles River Watershed is geographic context for the Project's cumulative impact analysis on surface water hydrology. Future growth in the Los Angeles River Watershed could cumulatively increase stormwater flows by increasing impervious area. However, in the City where the Project is located, development projects are reviewed by on a case-by-case basis by the City's Department of Public Works to ensure there is sufficient capacity locally and regionally within the Los Angeles River Watershed. Additionally, projects within the Los Angeles River Watershed are subject to NPDES requirements for stormwater discharges for both construction and operation. The Project and other development projects would be required to implement a SWPPP which would identify any hydrologic impacts to the receiving water bodies and would require BMPs to address any impacts during construction. The Project and other development projects would be required to comply with NPDES requirements for stormwater discharges for project operation. In accordance with City requirements, all development projects within the City that have a land disturbance activity and add, create or replace more than 500 square feet of impervious area, including the Project and any other qualifying projects, would be required to implement BMPs to manage stormwater runoff in accordance with LID guidelines. As discussed in Section 6.2.1 Surface Water Hydrology, the Project will capture all stormwater runoff within the Property, capture runoff from the 85th percentile storm event for reuse to supplement the Project's irrigation demand. Any runoff produced from larger storm events than the 85th percentile storm event will be discharged to the City's storm drain main via a piped connection. The Project is reducing the flow from the 50-year storm event discharging off-site from the pre-development condition. Furthermore, the City's Department of Public Works reviews all projects on a case-by-case basis to ensure sufficient local and regional infrastructure is available downstream to accommodate stormwater runoff. **Therefore, the Project's potential cumulative impacts on surface water hydrology would be less than significant.**

6.3.2 Surface Water Quality

The Los Angeles River Watershed is geographic context for the Project's cumulative impact analysis on surface water quality. The Los Angeles River Watershed includes 43 cities and some unincorporated communities that are all subject to the NPDES requirements for stormwater quality for both construction and operation. Each jurisdiction within the Los Angeles River Watershed is required to review projects on a case-by-case basis to ensure they meet NPDES requirements by implementing BMPs to manage stormwater quality for runoff for both construction and operation. The Project and other development projects that disturb an acre or more are required to implement a SWPPP which would identify any water quality impacts to the receiving water bodies and would require BMPs to address any impacts during construction. The Project and other development projects are required to comply with NPDES requirements for stormwater discharges for project operation by complying with LID requirements.

In accordance with City requirements, all development projects within the City that have a land disturbance activity and add, create or replace more than 500 square feet of impervious area, including the Project and any other qualifying projects, would be required to implement BMPs to minimize pollutant loadings from impervious surfaces such as roof tops, parking lots, and roadways in accordance with LID guidelines. As discussed in Section 6.2.2 Surface Water Quality, the Project will capture all stormwater runoff within the Property and implement BMPs to reduce pollutant loading to meet the NPDES requirements for both construction and operation. The Project and other qualifying development projects would be required to meet LID guidelines, implementing BMPs to minimize pollutant loadings from impervious surfaces such as roof tops, parking lots and roadways.
Therefore, the Project's potential cumulative impacts on surface water quality would be less than significant.

6.3.3 **Groundwater Hydrology**

The Central Basin is the geographic context for the cumulative impact analysis on groundwater level. Based on Los Angeles County Public Works Groundwater Well Maps, there are no groundwater production wells or public water supply wells near the Property so construction activities would not affect any existing wells. The Project will consist primarily of impervious areas, including buildings and hardscape that will not allow for infiltration. The Project will be capturing stormwater on-site through roof drains and area drains, which will have piped connections to below-grade pre-treatment structures designed to meet LID requirements. Any additional runoff, in excess of what is required to be treated per the LID requirements, will be routed via an overflow pipe to the City's storm drain system. There will be very minimal opportunity for the stormwater runoff from the Project to infiltrate and impact the regional groundwater basin. Additionally, the Project is located in a highly urbanized area, which is very developed with impervious area. It is unlikely that other development projects would have any impact on the groundwater hydrology, due to the requirements to meet LID requirements and urbanized setting. **Therefore, the Project's potential cumulative impacts on groundwater hydrology would be less than significant.**

6.3.4 **Groundwater Quality**

The Central Basin is the geographic context for the cumulative impact analysis on groundwater level. In accordance with City requirements, the Project and all future development within the City that are in the Central Basin, would be subject to LARWQCB requirements relating to groundwater quality. The Project will not be infiltrating any water during construction or operation and would not expand any potential areas of contamination, increasing the level of contamination, or cause regulatory water quality standard violations, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act. Based on the Property conditions, there is minimal opportunity for the stormwater runoff from the Project to infiltrate and impact the regional groundwater basin. The Project and any other development projects with potential to impact groundwater quality would be subject to LARWQCB requirements and would be reviewed prior to construction. **Therefore, the Project's potential cumulative impacts on groundwater quality would be less than significant.**

7.0 LEVEL OF SIGNIFICANCE

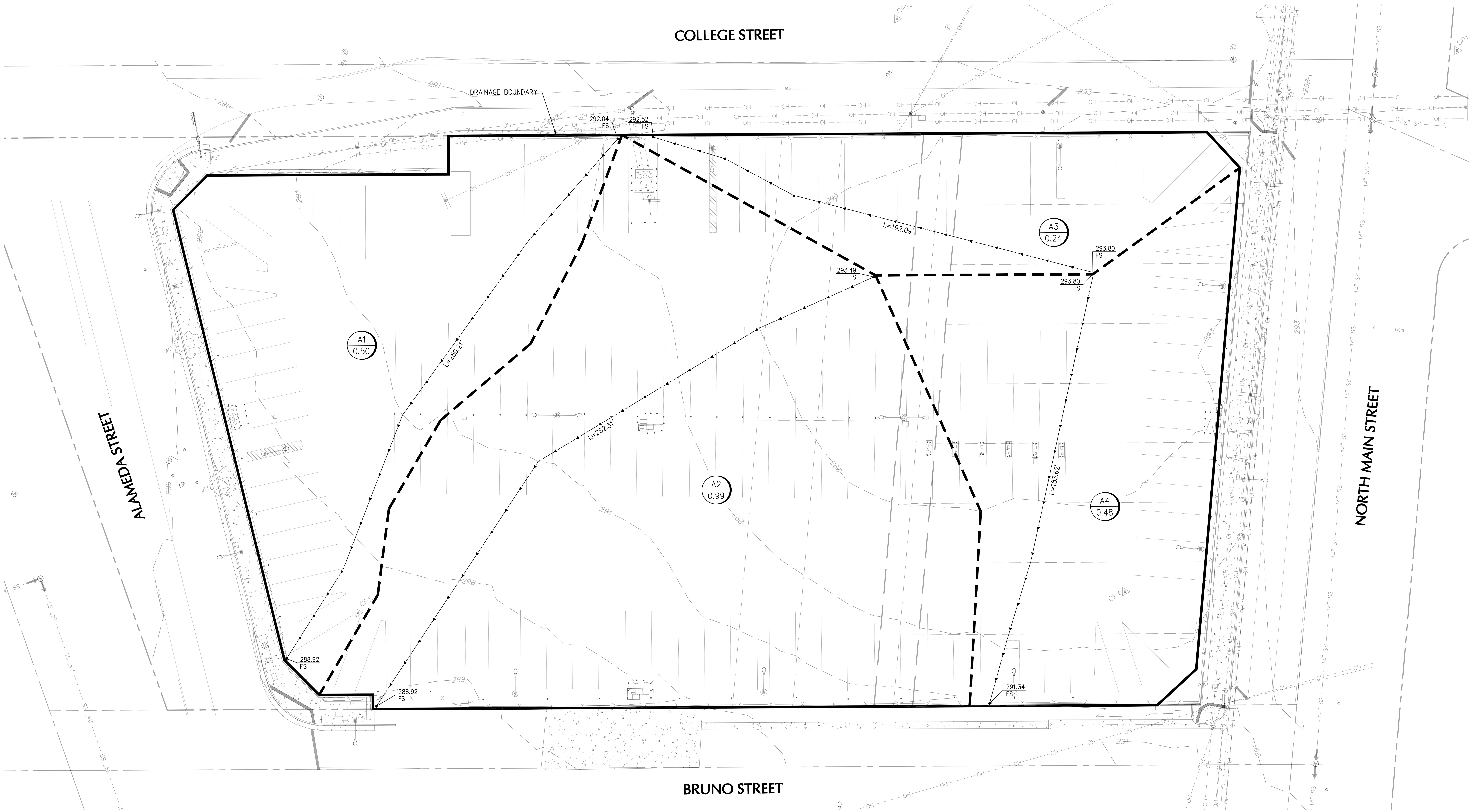
Based on the analysis contained in this report, no significant impacts have been identified for surface water hydrology, surface water quality, groundwater hydrology, or groundwater quality for this Project, and therefore, Project impacts, including cumulative impacts, would be less than significant.

8.0 REFERENCES

1. https://www.waterboards.ca.gov/water_issues/programs/tmdl/2018state_ir_reports_final/apx_c_state_factsheets/01095.shtml

2. City of Los Angeles. LA. CEQA Thresholds Guide. 2006 https://planning.lacity.org/eir/CrossroadsHwd/deir/files/references/A07.pdf

FIGURES



SUMMARY TABLE

SUBAREAS ID	RUNOFF COEFFICIENT "C"	TIME OF CONC. Tc (MIN.)	RAINFALL INTENSITY "I" (INCH/HOUR)	DRAINAGE AREA (AC)	RUNOFF FLOW RATE "Q_{100}" (CFS)
A1	0.900	5.00	3.639	0.50	1.64
A2	0.900	5.00	3.639	0.99	3.24
A3	0.900	5.00	3.639	0.24	0.79
A4	0.900	5.00	3.639	0.48	1.57
TOTAL	--	5.00	--	2.21	7.24

LEGEND

- PROJECT DRAINAGE BOUNDARY
- SUB-AREA BOUNDARY
- FLOW PATH
- SUB-DRAINAGE AREA ID
- X / X — SUB-DRAINAGE AREA IDENTIFIER
- SUB-DRAINAGE SURFACE AREA (ACRE)

GENERAL NOTES

1. SEE HYDROLOGY REPORT, PREPARED BY LANGAN ENGINEERING, FOR THE COMPLETE POST-DEVELOPMENT HYDROLOGY CALCULATIONS.
2. CALCULATIONS WERE BASED ON THE REQUIREMENTS ON THE LOS ANGELES COUNTY HYDROLOGY MANUAL FOR THE 50-YEAR STORM.

ABBREVIATIONS

FS FINISHED ELEVATION
L LENGTH OF FLOW

20 0 5 10 20
SCALE: 1 INCH = 20 FEET

Date	Description	No.
	Revisions	

LANGAN
Langan Engineering and Environmental Services, Inc.
515 South Flower Street, Suite 2860
Los Angeles, CA 90071
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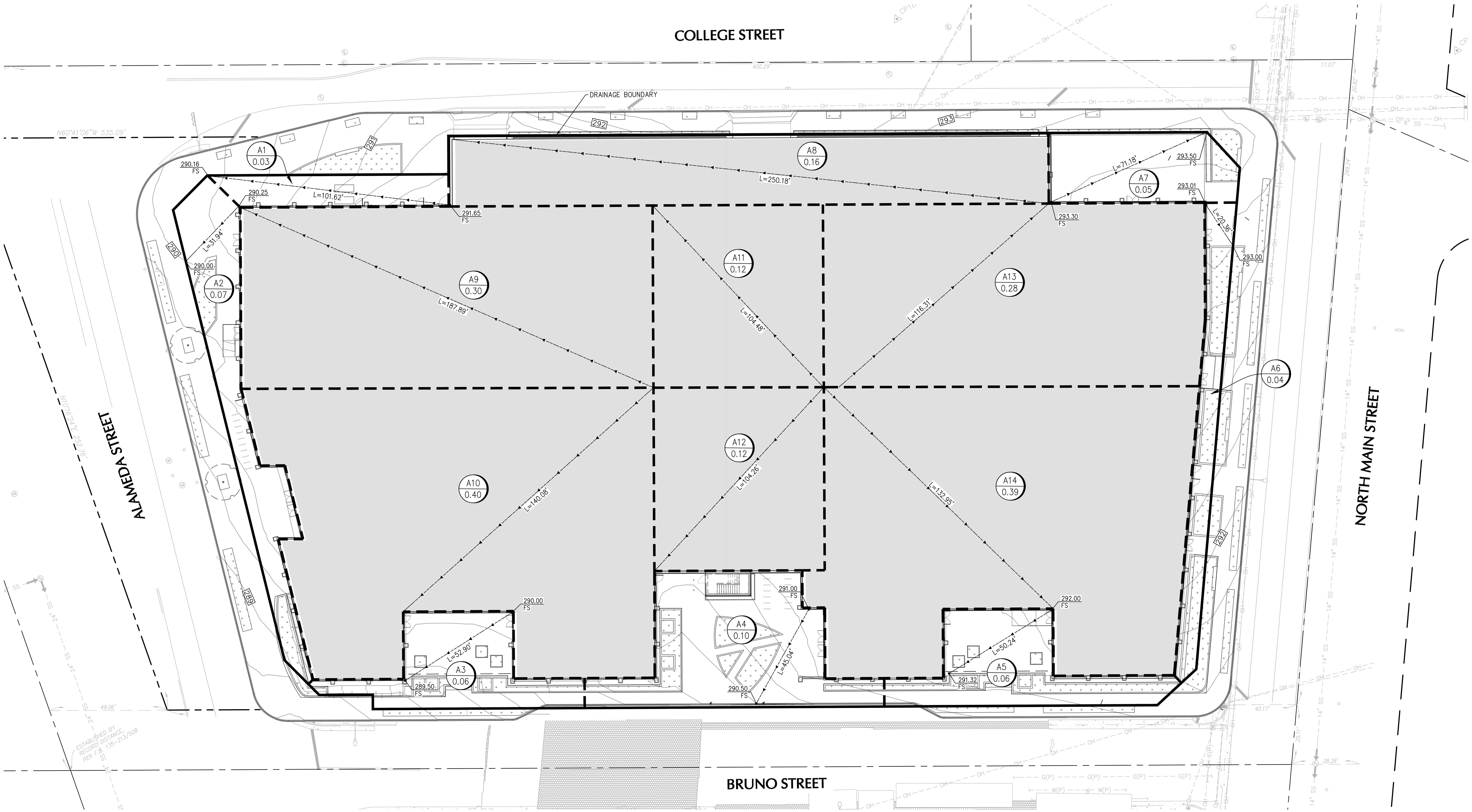
Project: 130 W COLLEGE
CITY OF LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

Drawing Title: EXISTING HYDROLOGY EXHIBIT

Project No. 721036101
Date DECEMBER 1, 2022
Drawn By MW
Checked By KR
Figure No. 1

LANGAN
Project No. 721036101

Filename: C:\bms\langan-pw-01\d0269104\721036101-0101-CA104-0101.dwg Date: 12/1/2022 Time: 08:26 User: mwong Style Table: Langan.stb Layout: Layout1



SUMMARY TABLE

SUBAREAS ID	RUNOFF COEFFICIENT "C"	TIME OF CONC. Tc (MIN.)	RAINFALL INTENSITY "I" (INCH/HOUR)	DRAINAGE AREA (AC)	RUNOFF FLOW RATE "Q_{100}" (CFS)
A1	0.900	5.00	3.639	0.03	0.10
A2	0.896	5.00	3.639	0.07	0.23
A3	0.894	5.00	3.639	0.06	0.20
A4	0.893	5.00	3.639	0.10	0.33
A5	0.894	5.00	3.639	0.06	0.20
A6	0.887	5.00	3.639	0.04	0.13
A7	0.894	5.00	3.639	0.05	0.16
A8	0.874	5.00	3.639	0.16	0.51
A9	0.900	5.00	3.639	0.30	0.98
A10	0.895	5.00	3.639	0.40	1.30
A11	0.892	5.00	3.639	0.12	0.39
A12	0.893	5.00	3.639	0.12	0.39
A13	0.900	5.00	3.639	0.28	0.92
A14	0.895	5.00	3.639	0.39	1.27
TOTAL	--	5.00	--	2.21	7.10

LEGEND

- PROJECT DRAINAGE BOUNDARY
- SUB-AREA BOUNDARY
- FLOW PATH
- SUB-DRAINAGE AREA ID
- X / X — SUB-DRAINAGE AREA IDENTIFIER
- SUB-DRAINAGE SURFACE AREA (ACRE)

GENERAL NOTES

1. SEE HYDROLOGY REPORT, PREPARED BY LANGAN ENGINEERING, FOR THE COMPLETE PROPOSED HYDROLOGY CALCULATIONS.
2. CALCULATIONS WERE BASED ON THE REQUIREMENTS ON THE LOS ANGELES COUNTY HYDROLOGY MANUAL FOR THE 50-YEAR STORM.

ABBREVIATIONS

FS FINISHED ELEVATION
L LENGTH OF FLOW

20 0 5 10 20
SCALE: 1 INCH = 20 FEET

Date	Description	No.
	Revisions	

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Project
130 W COLLEGE
CITY OF LOS ANGELES
LOS ANGELES COUNTY CALIFORNIA

Drawing Title
PROPOSED HYDROLOGY EXHIBIT

Project No. 721036101
Date JANUARY 30, 2024
Drawn By MW
Checked By KR

Figure No. 3

Project No. 721036101

LANGAN

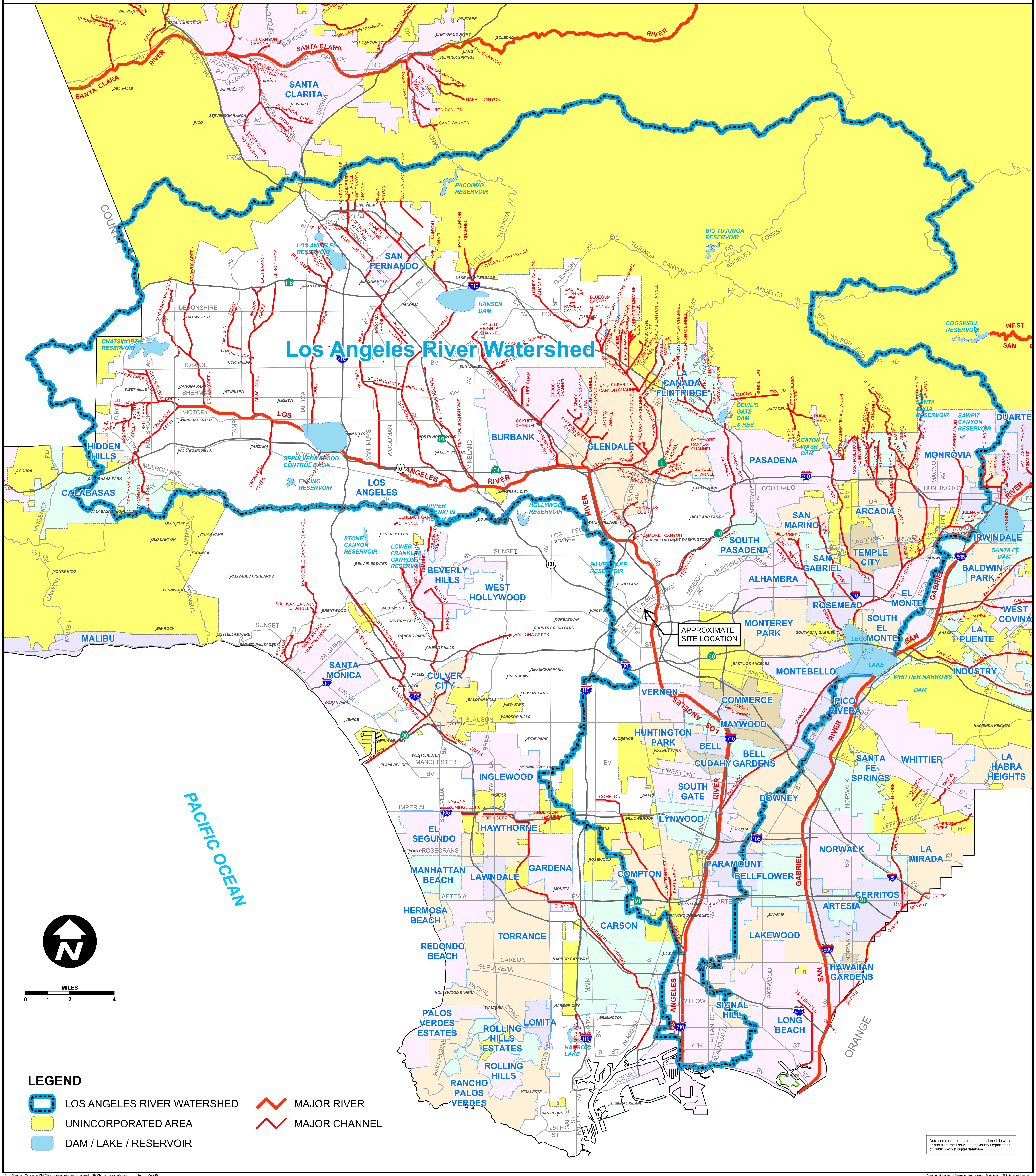
Filename: C:\bms\langan-pw-01\d0269104\721036101-0101-CA104-0102.dwg Date: 1/30/2024 Time: 16:02 User: llin Style Table: Langan.stb Layout: Layout1

APPENDIX A

Los Angeles River Watershed Map

COUNTY OF LOS ANGELES

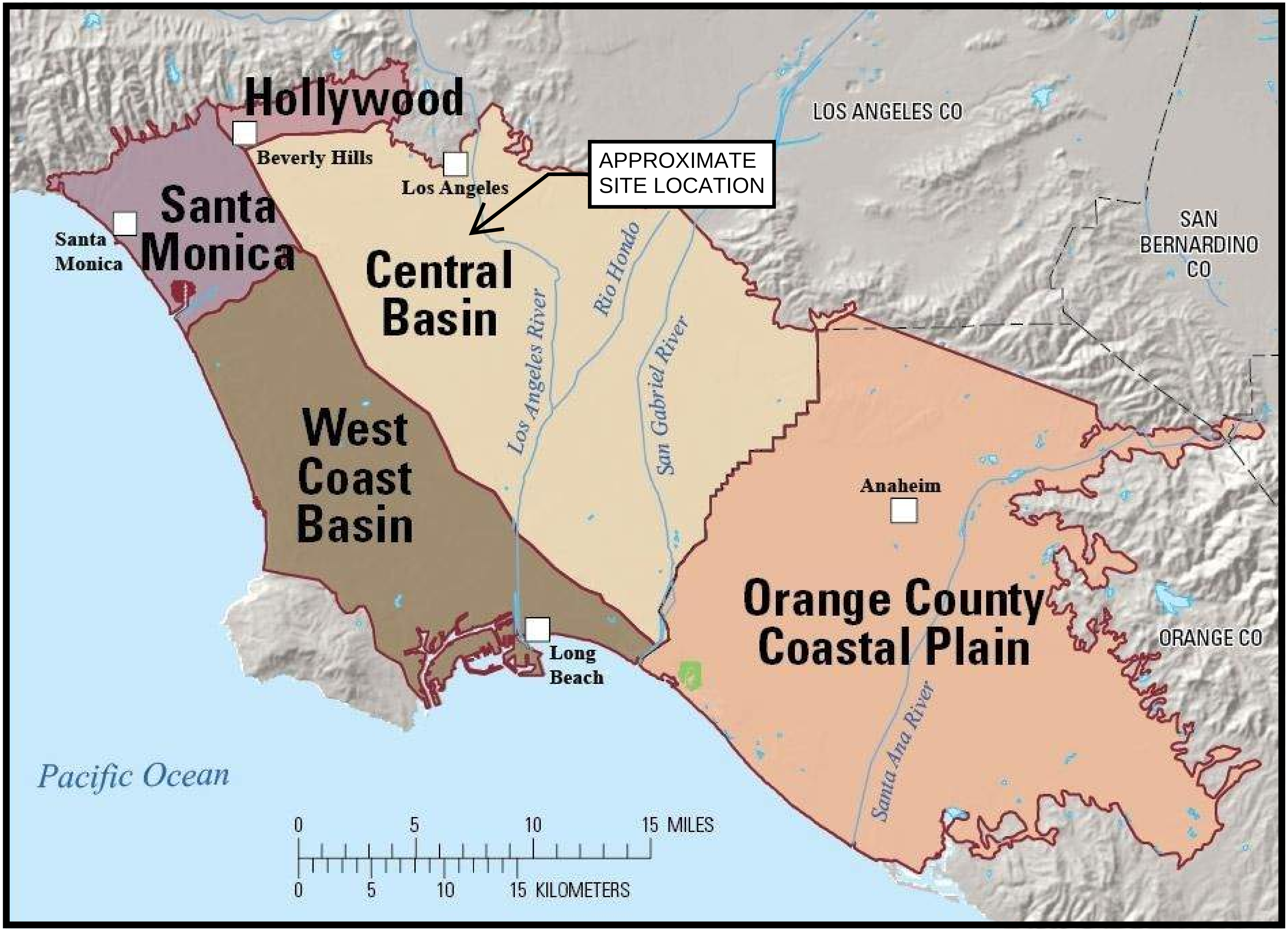
LOS ANGELES RIVER WATERSHED



APPENDIX B

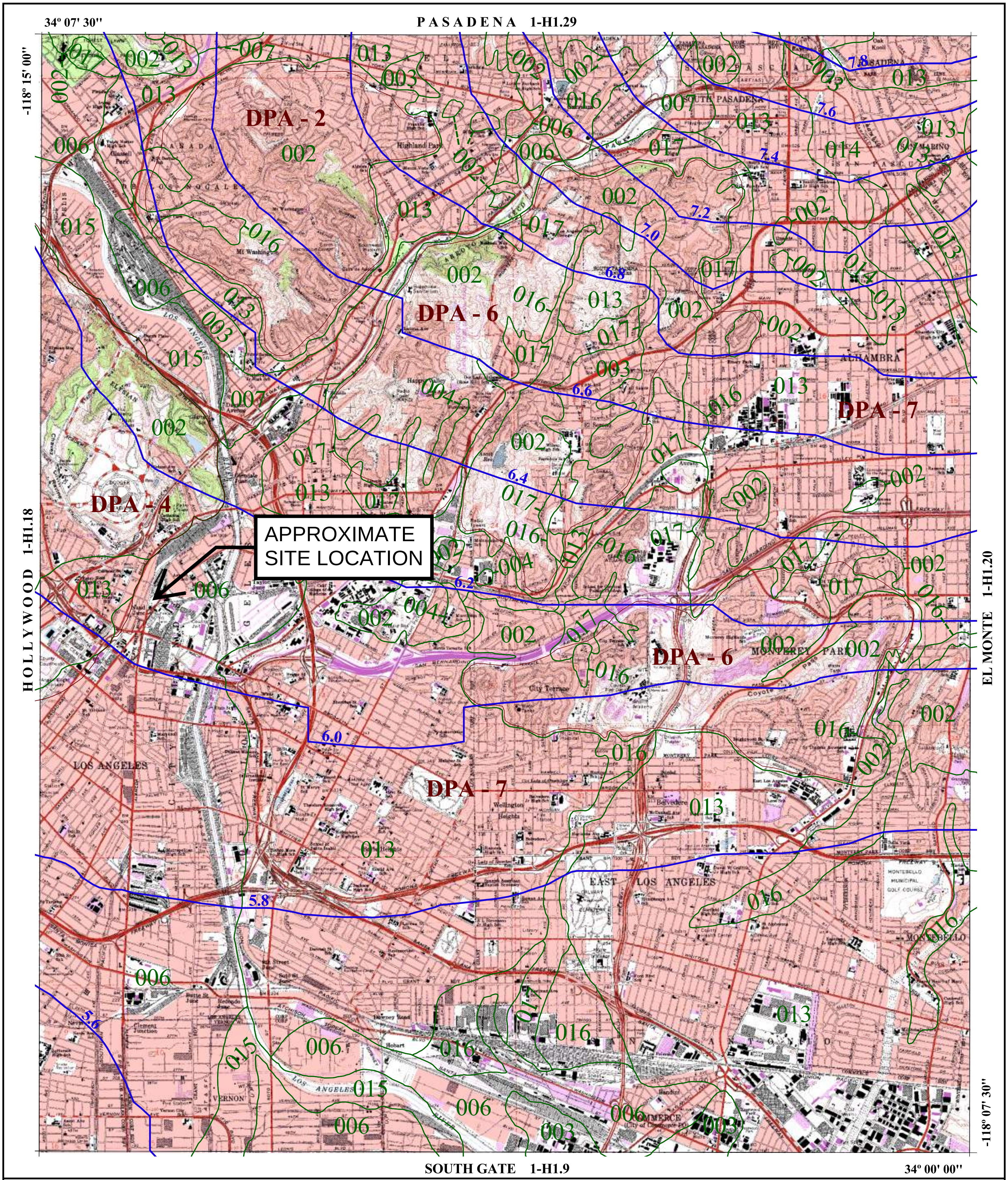
Coastal Plain of Los Angeles Groundwater Basin Map

Figure 5. Coastal Plain of Los Angeles Groundwater Basin



APPENDIX C

Los Angeles County Hydrology Manual – 50-Year 24-Hour Isohyet Map



016	SOIL CLASSIFICATION AREA	
7.2	INCHES OF RAINFALL	
DPA - 6	DEBRIS POTENTIAL AREA	

1 0 1 2 Miles

N S E W

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

LOS ANGELES 50-YEAR 24-HOUR ISOHYET

1-H1.19

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

APPENDIX D

Existing HydroCalc Hydrology Results

Peak Flow Hydrologic Analysis

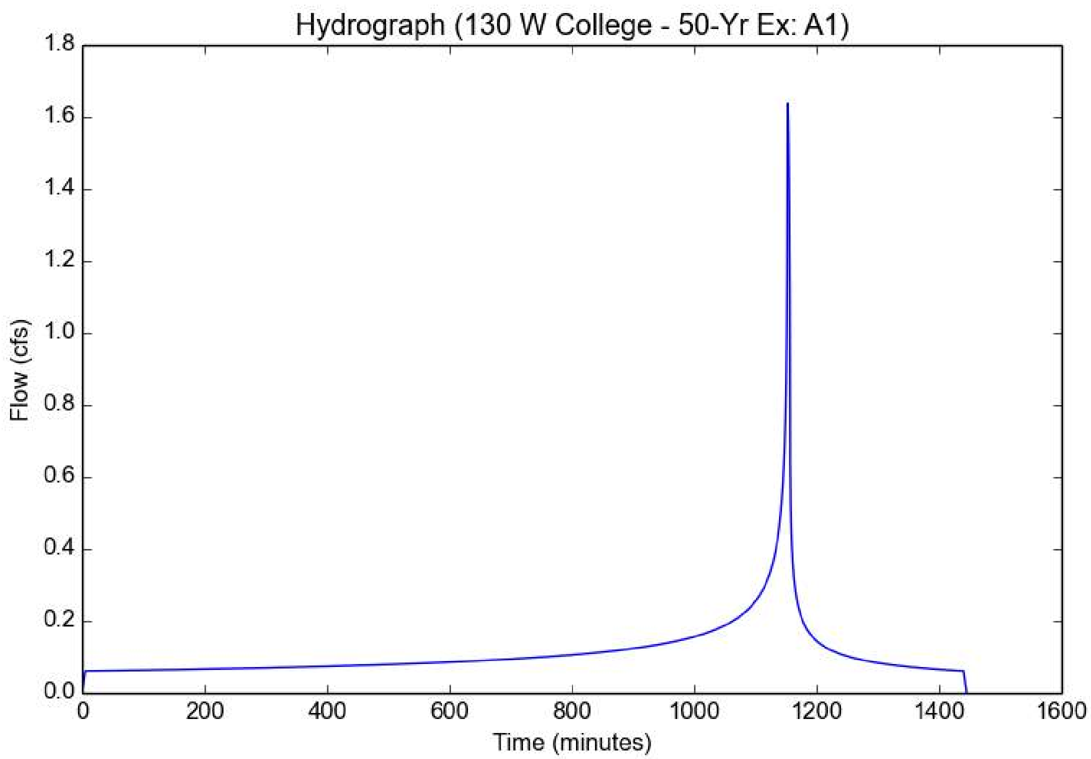
File location: //langan.com/data/LAX/data1/721036101/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/Calculations/HydroCalc/130 W Colleg
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Ex
Subarea ID	A1
Area (ac)	0.5
Flow Path Length (ft)	259.21
Flow Path Slope (vft/hft)	0.012036
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.6377
Burned Peak Flow Rate (cfs)	1.6377
24-Hr Clear Runoff Volume (ac-ft)	0.2269
24-Hr Clear Runoff Volume (cu-ft)	9882.0031



Peak Flow Hydrologic Analysis

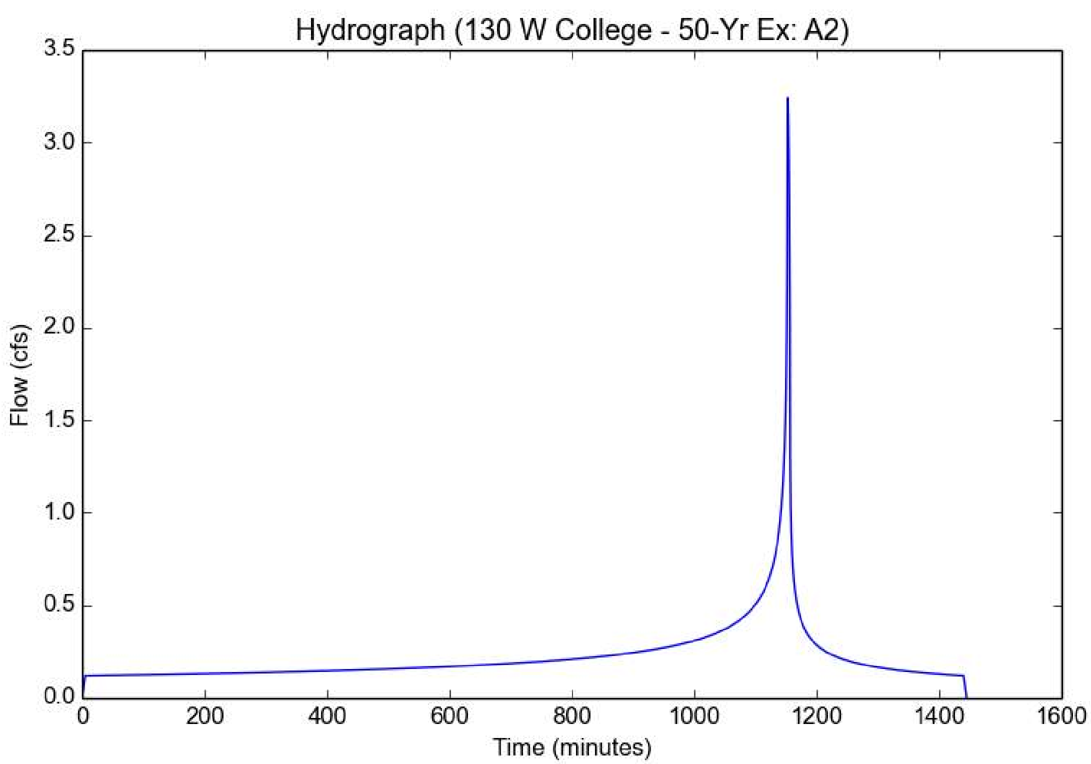
File location: //langan.com/data/LAX/data1/721036101/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/Calculations/HydroCalc/130 W Colleg
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Ex
Subarea ID	A2
Area (ac)	0.99
Flow Path Length (ft)	282.31
Flow Path Slope (vft/hft)	0.016187
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.2427
Burned Peak Flow Rate (cfs)	3.2427
24-Hr Clear Runoff Volume (ac-ft)	0.4492
24-Hr Clear Runoff Volume (cu-ft)	19566.3661



Peak Flow Hydrologic Analysis

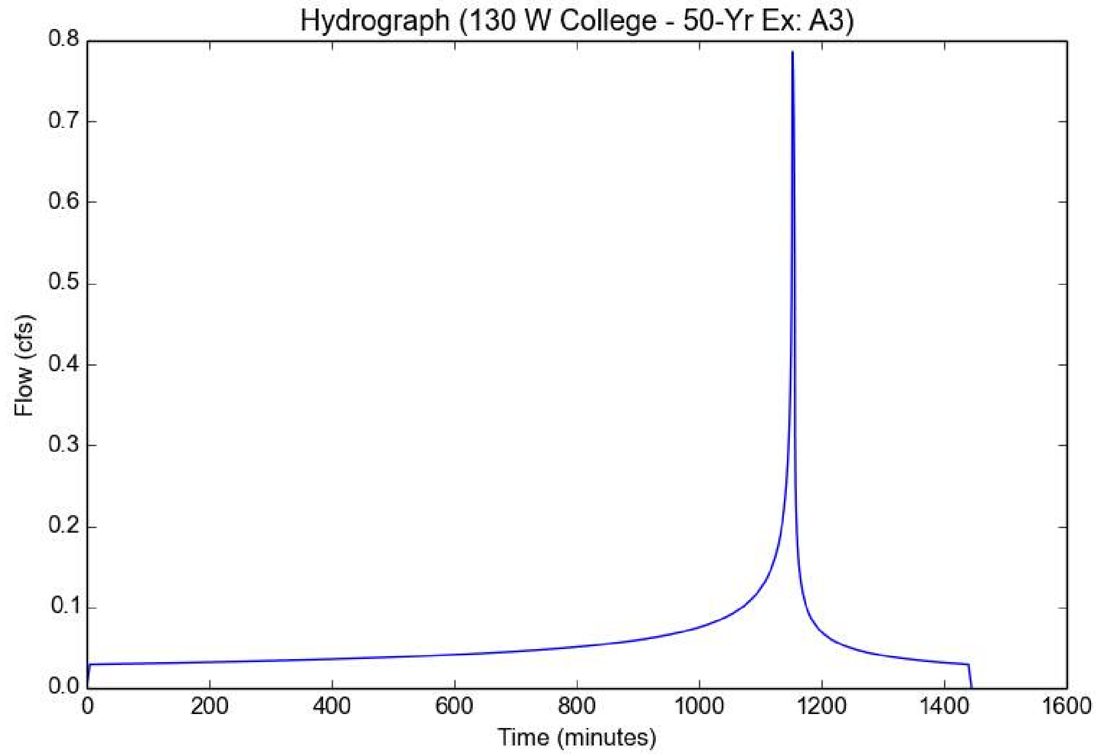
File location: //langan.com/data/LAX/data1/721036101/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/Calculations/HydroCalc/130 W Colleg
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Ex
Subarea ID	A3
Area (ac)	0.24
Flow Path Length (ft)	192.09
Flow Path Slope (vft/hft)	0.006663
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.7861
Burned Peak Flow Rate (cfs)	0.7861
24-Hr Clear Runoff Volume (ac-ft)	0.1089
24-Hr Clear Runoff Volume (cu-ft)	4743.3615



Peak Flow Hydrologic Analysis

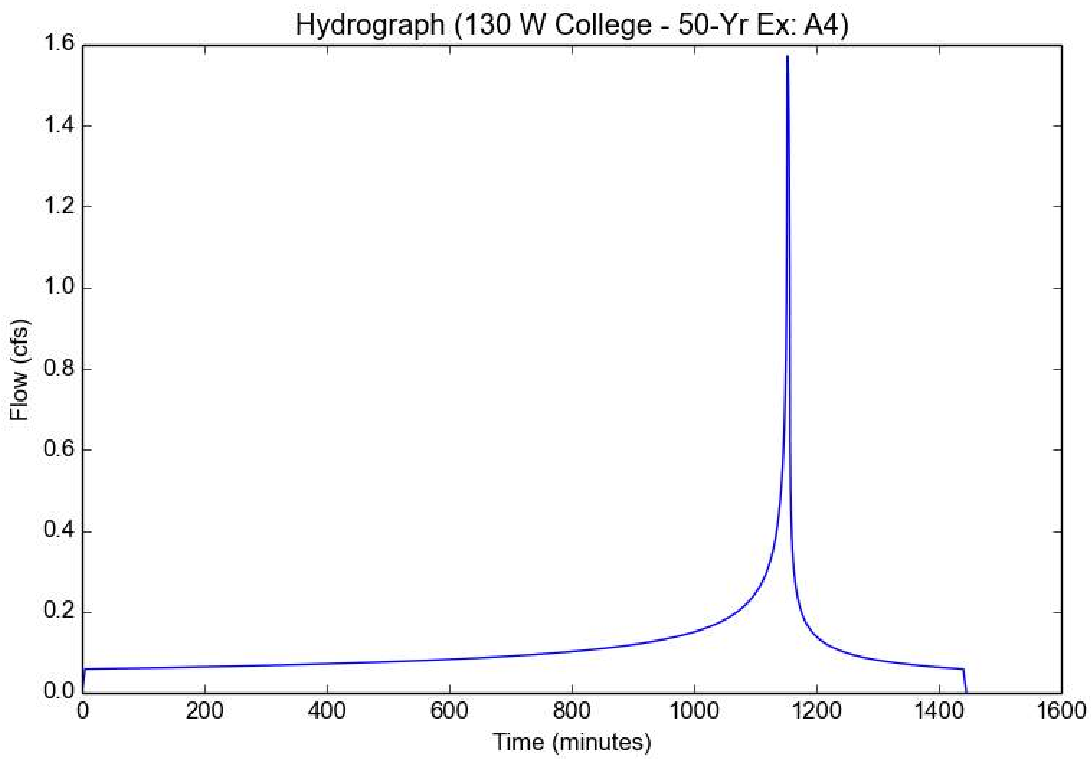
File location: //langan.com/data/LAX/data1/721036101/Project Data/_Discipline/Site Civil/Reports/Hydrology Report/Calculations/HydroCalc/130 W Colleg
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Ex
Subarea ID	A4
Area (ac)	0.48
Flow Path Length (ft)	183.62
Flow Path Slope (vft/hft)	0.013397
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.5722
Burned Peak Flow Rate (cfs)	1.5722
24-Hr Clear Runoff Volume (ac-ft)	0.2178
24-Hr Clear Runoff Volume (cu-ft)	9486.723



APPENDIX E

Proposed HydroCalc Hydrology Results – 50 Year Storm

Peak Flow Hydrologic Analysis

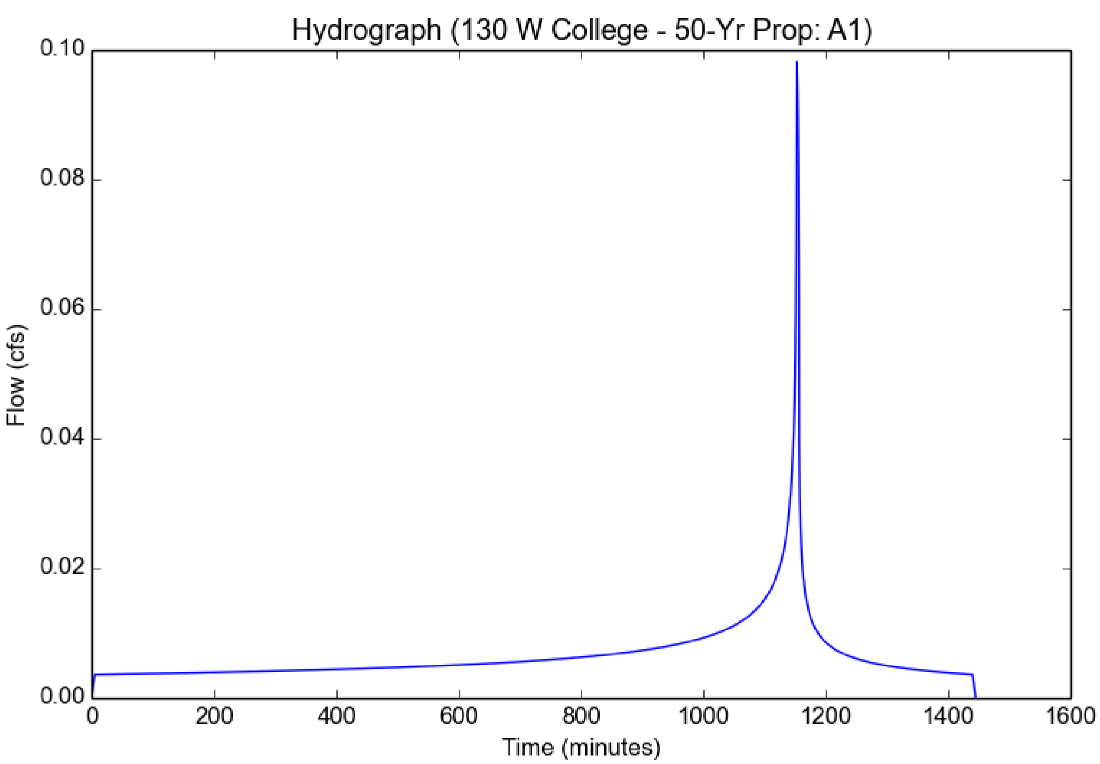
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A1
Area (ac)	0.03
Flow Path Length (ft)	101.62
Flow Path Slope (vft/hft)	0.001869
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.99
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8996
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0982
Burned Peak Flow Rate (cfs)	0.0982
24-Hr Clear Runoff Volume (ac-ft)	0.0135
24-Hr Clear Runoff Volume (cu-ft)	588.4329



Peak Flow Hydrologic Analysis

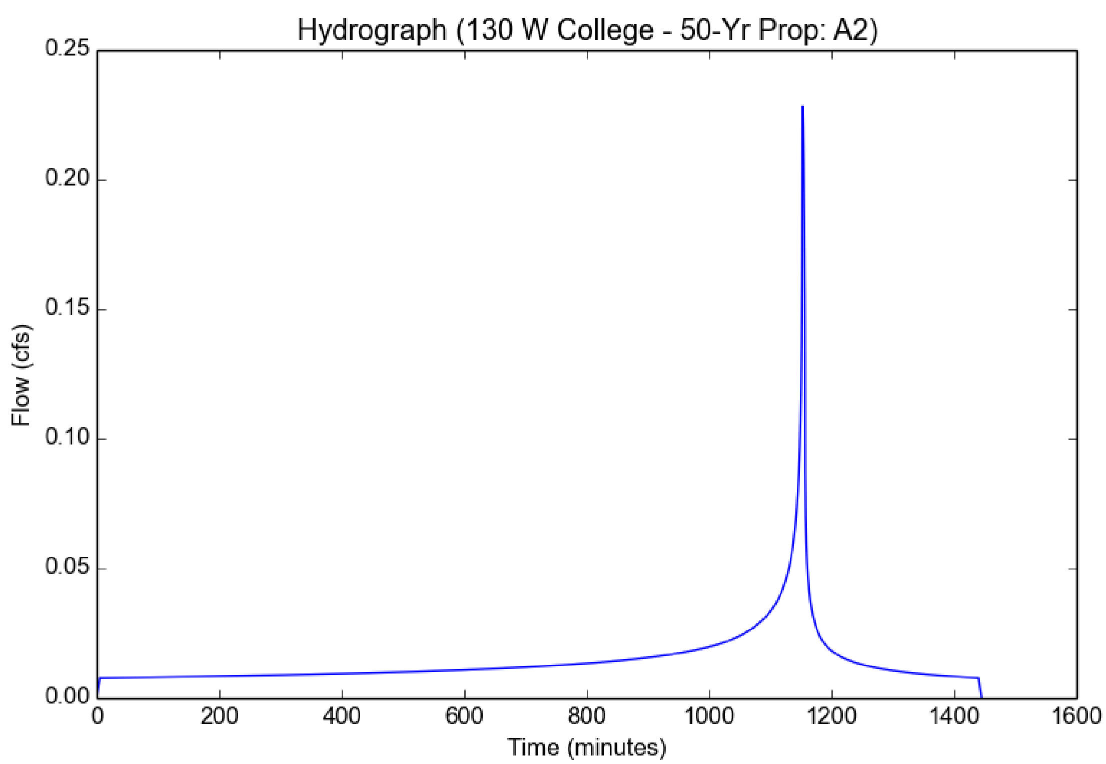
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A2
Area (ac)	0.07
Flow Path Length (ft)	31.94
Flow Path Slope (vft/hft)	0.007827175
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.89
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8959
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.2282
Burned Peak Flow Rate (cfs)	0.2282
24-Hr Clear Runoff Volume (ac-ft)	0.0291
24-Hr Clear Runoff Volume (cu-ft)	1268.3075



Peak Flow Hydrologic Analysis

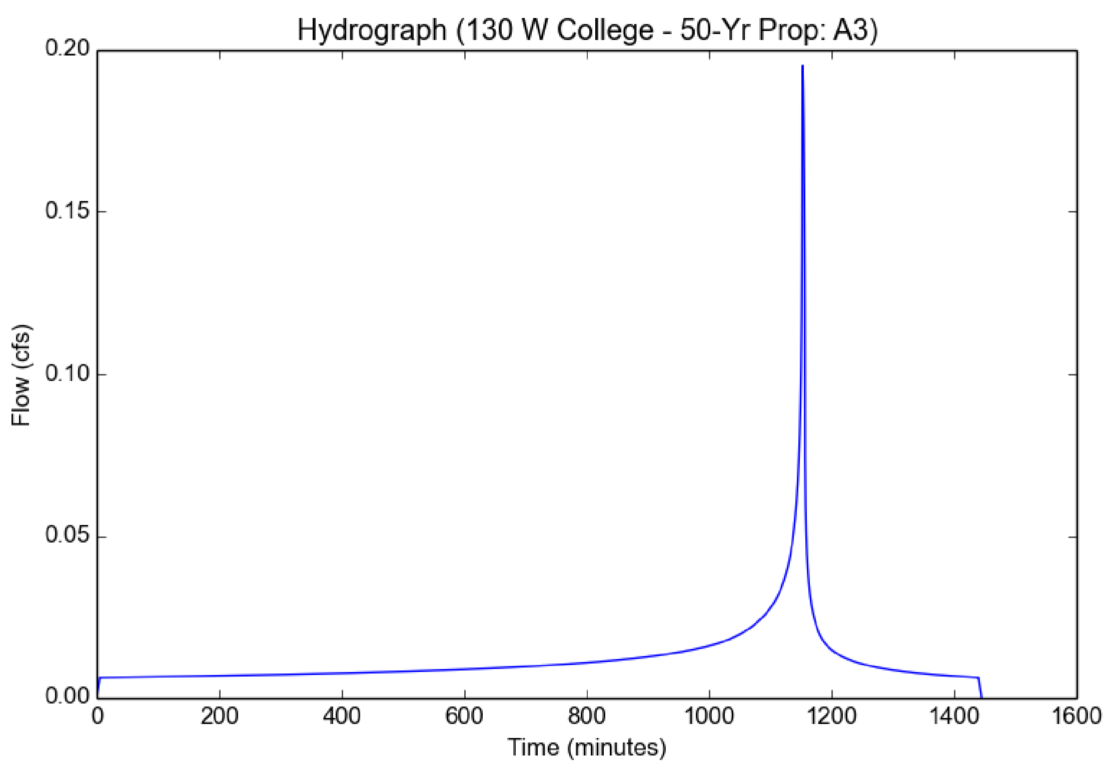
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A3
Area (ac)	0.06
Flow Path Length (ft)	52.9
Flow Path Slope (vft/hft)	0.009451796
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.84
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.894
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1952
Burned Peak Flow Rate (cfs)	0.1952
24-Hr Clear Runoff Volume (ac-ft)	0.0239
24-Hr Clear Runoff Volume (cu-ft)	1042.2481



Peak Flow Hydrologic Analysis

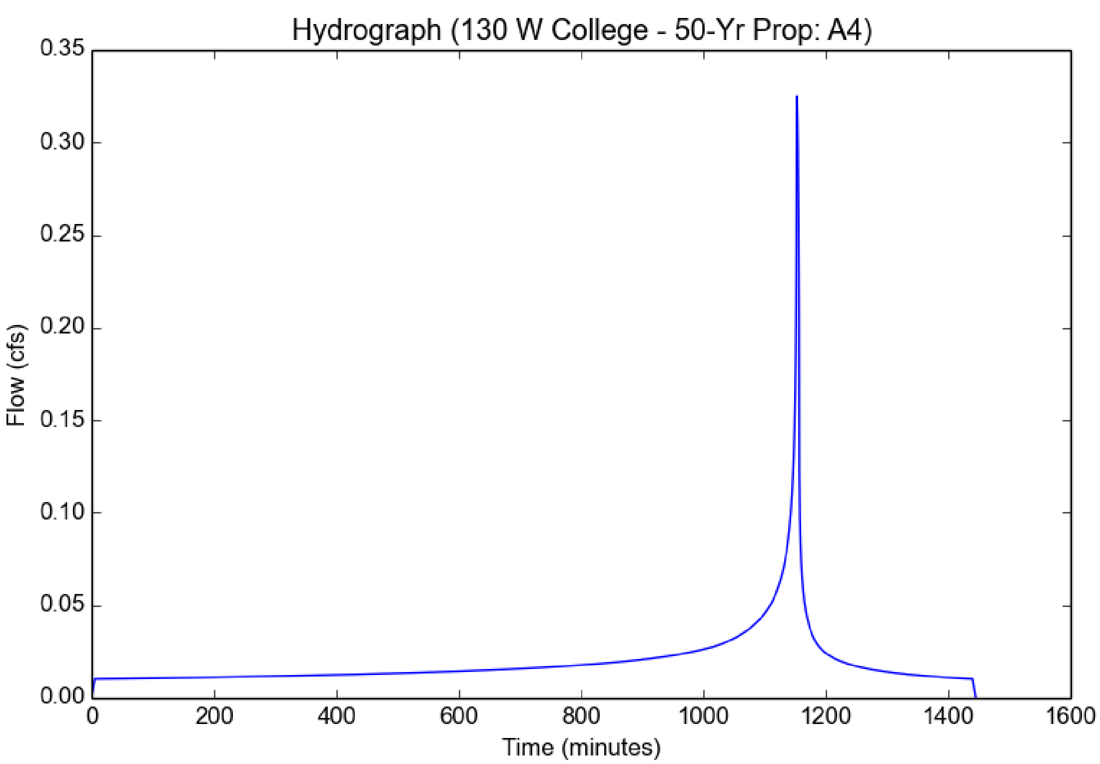
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A4
Area (ac)	0.1
Flow Path Length (ft)	45.04
Flow Path Slope (vft/hft)	0.011101243
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.82
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8933
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3251
Burned Peak Flow Rate (cfs)	0.3251
24-Hr Clear Runoff Volume (ac-ft)	0.0392
24-Hr Clear Runoff Volume (cu-ft)	1707.1652



Peak Flow Hydrologic Analysis

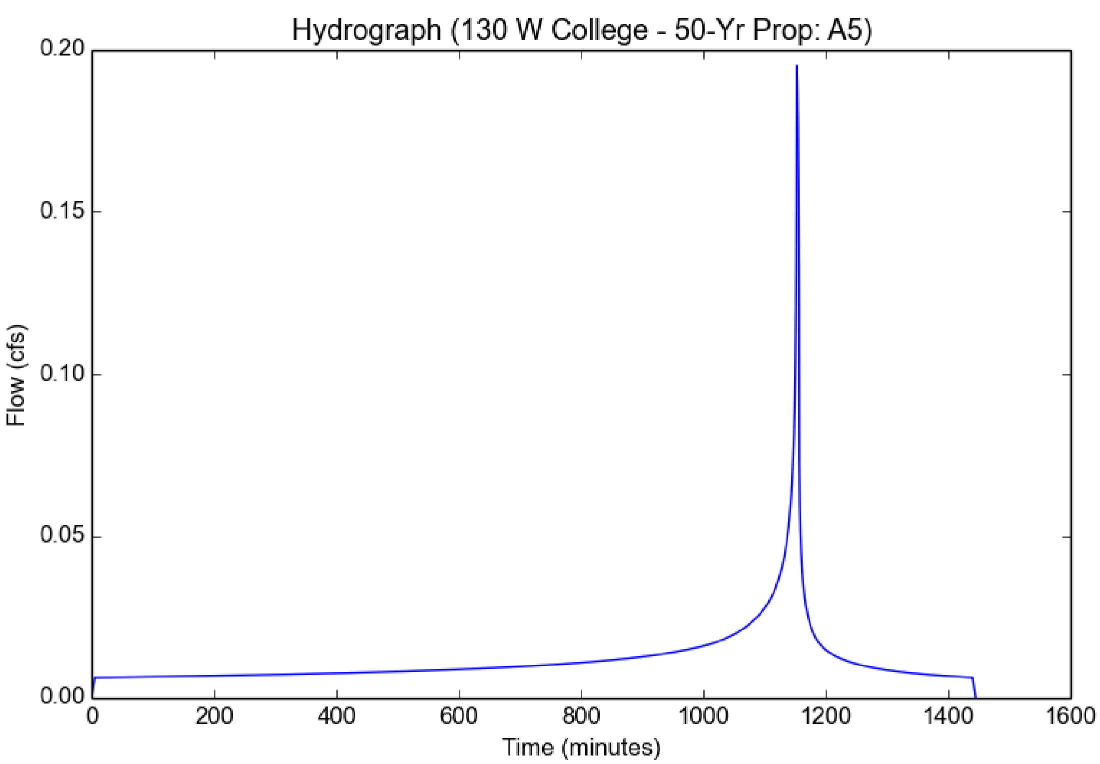
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A5
Area (ac)	0.06
Flow Path Length (ft)	50.24
Flow Path Slope (vft/hft)	0.013535032
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.84
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.894
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1952
Burned Peak Flow Rate (cfs)	0.1952
24-Hr Clear Runoff Volume (ac-ft)	0.0239
24-Hr Clear Runoff Volume (cu-ft)	1042.2481



Peak Flow Hydrologic Analysis

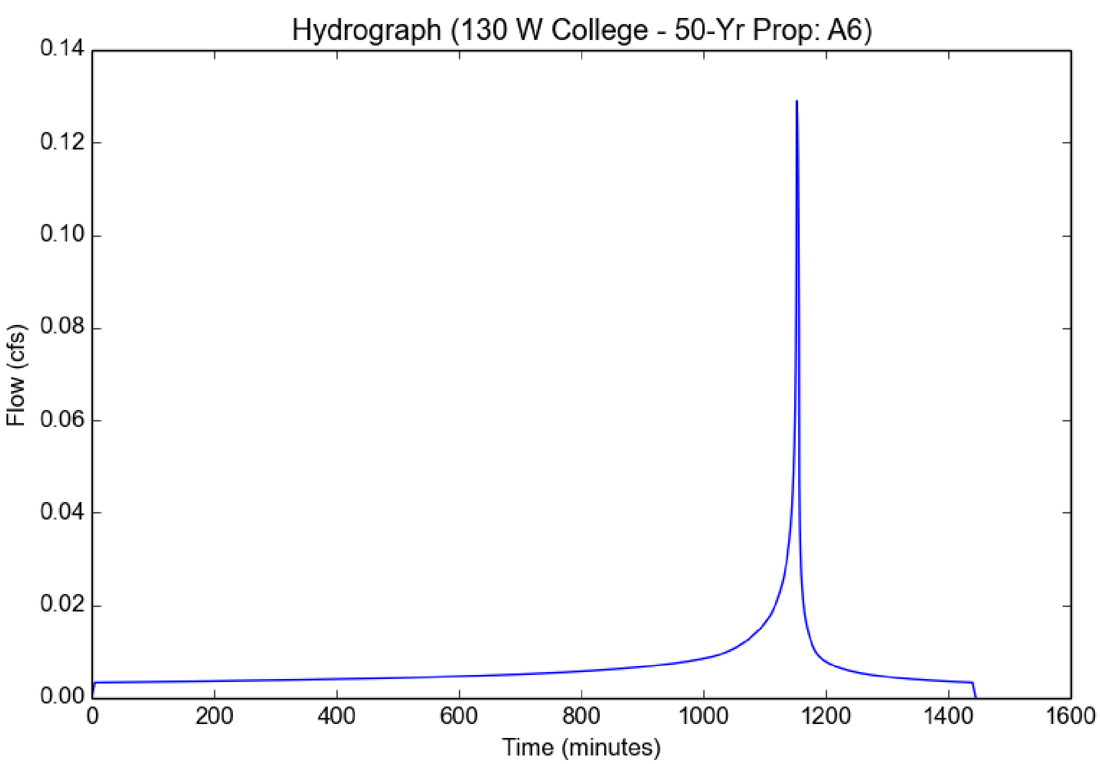
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A6
Area (ac)	0.04
Flow Path Length (ft)	20.36
Flow Path Slope (vft/hft)	0.027013
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.64
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8866
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1291
Burned Peak Flow Rate (cfs)	0.1291
24-Hr Clear Runoff Volume (ac-ft)	0.0132
24-Hr Clear Runoff Volume (cu-ft)	575.1719



Peak Flow Hydrologic Analysis

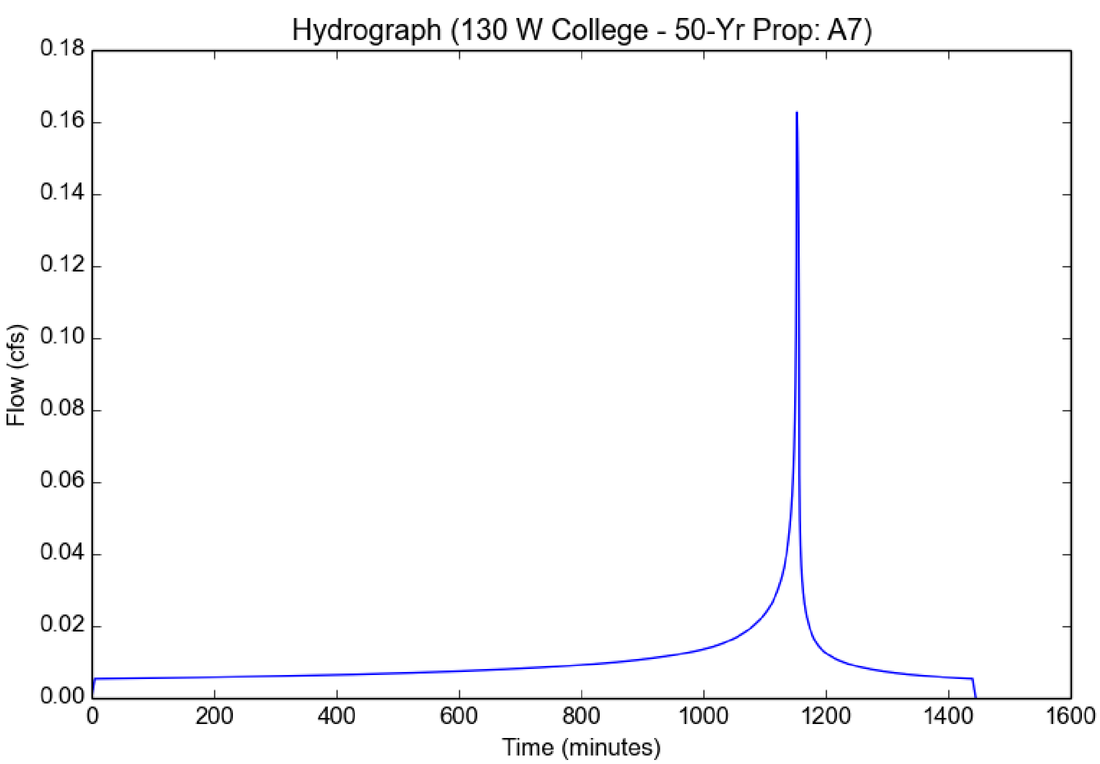
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A7
Area (ac)	0.05
Flow Path Length (ft)	71.18
Flow Path Slope (vft/hft)	0.013627
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.85
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8944
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.1628
Burned Peak Flow Rate (cfs)	0.1628
24-Hr Clear Runoff Volume (ac-ft)	0.0201
24-Hr Clear Runoff Volume (cu-ft)	876.0189



Peak Flow Hydrologic Analysis

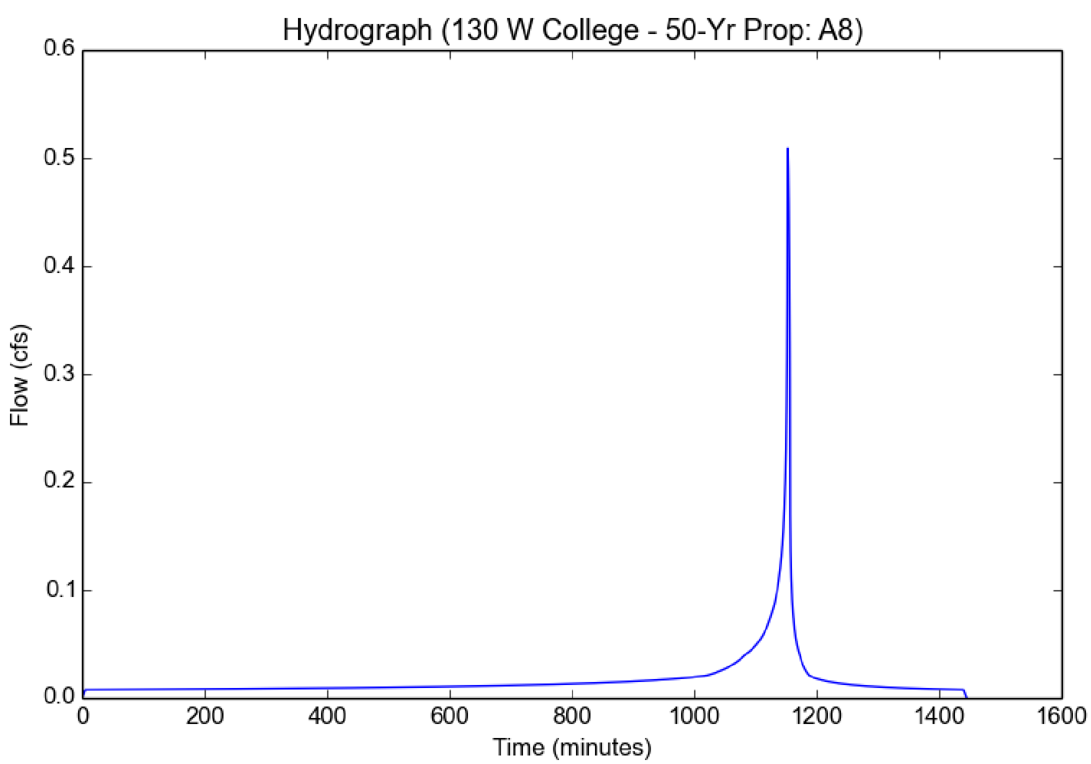
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A8
Area (ac)	0.16
Flow Path Length (ft)	250.18
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.31
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8743
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.5091
Burned Peak Flow Rate (cfs)	0.5091
24-Hr Clear Runoff Volume (ac-ft)	0.0347
24-Hr Clear Runoff Volume (cu-ft)	1510.9302



Peak Flow Hydrologic Analysis

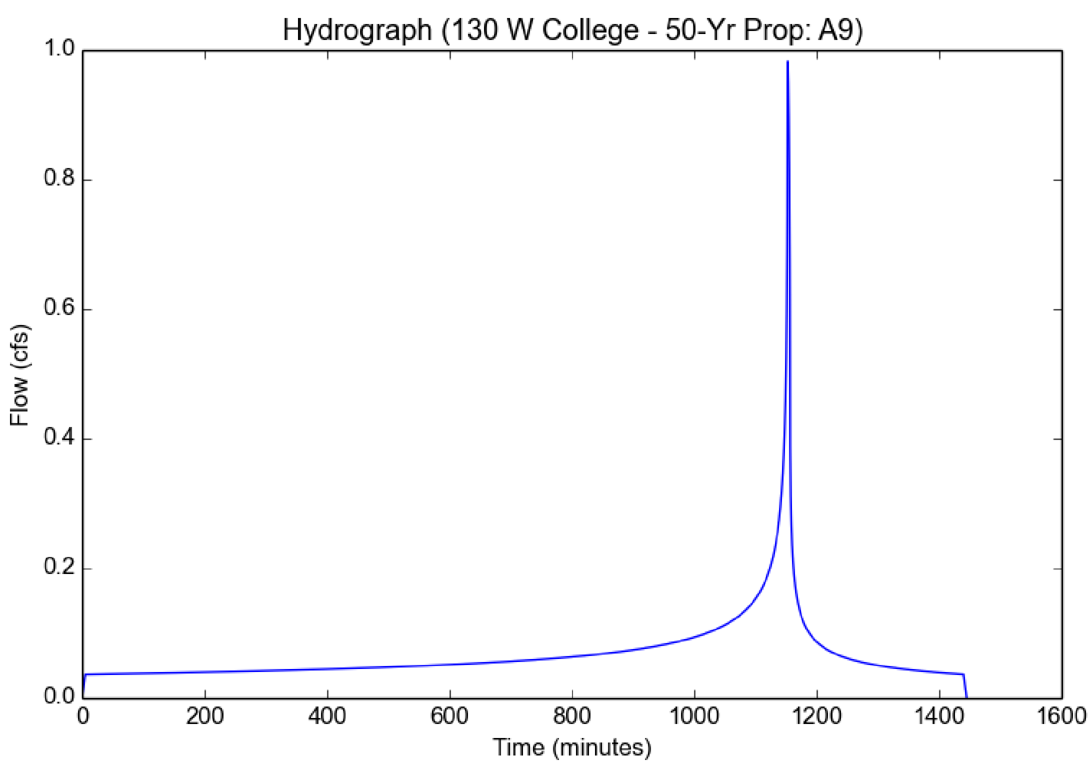
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A9
Area (ac)	0.3
Flow Path Length (ft)	187.89
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.9826
Burned Peak Flow Rate (cfs)	0.9826
24-Hr Clear Runoff Volume (ac-ft)	0.1361
24-Hr Clear Runoff Volume (cu-ft)	5929.2019



Peak Flow Hydrologic Analysis

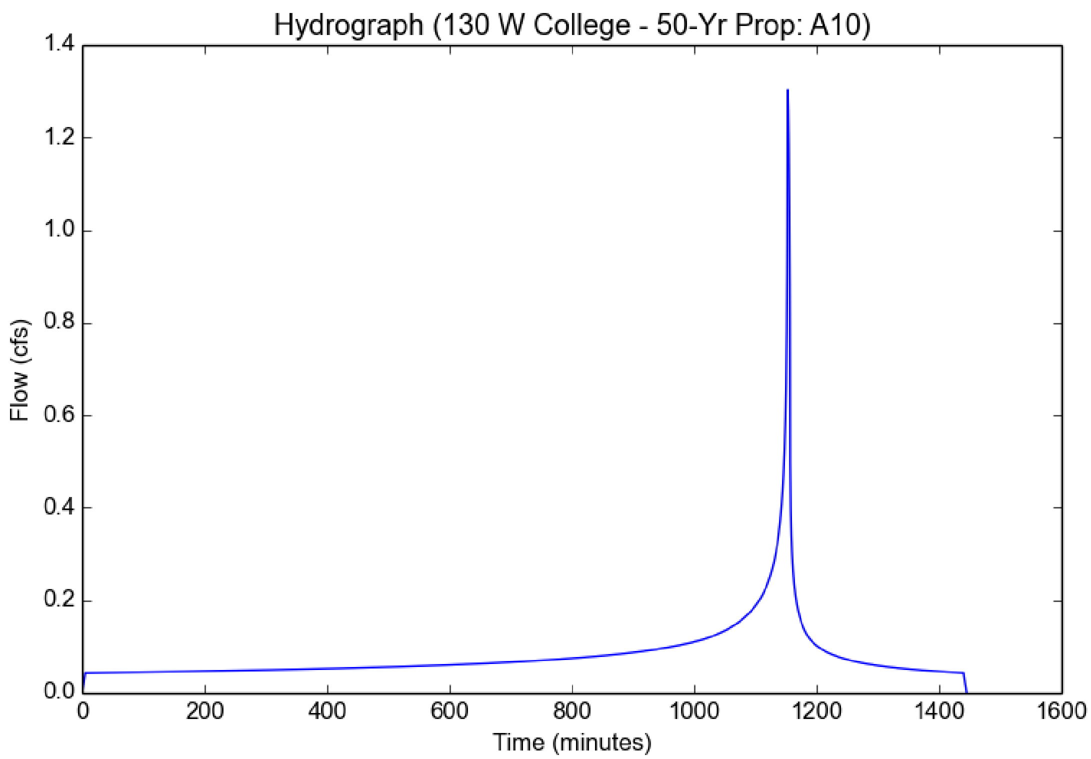
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A10
Area (ac)	0.4
Flow Path Length (ft)	140.08
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.87
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8952
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.3031
Burned Peak Flow Rate (cfs)	1.3031
24-Hr Clear Runoff Volume (ac-ft)	0.1636
24-Hr Clear Runoff Volume (cu-ft)	7127.8112



Peak Flow Hydrologic Analysis

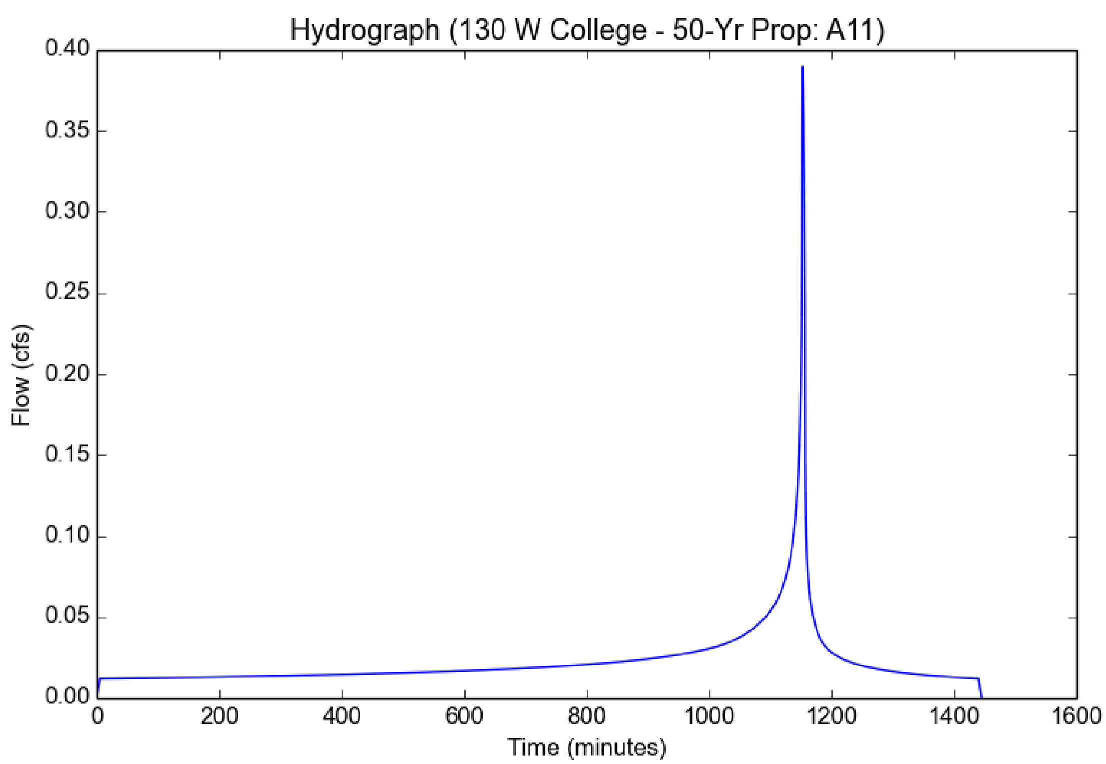
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A11
Area (ac)	0.12
Flow Path Length (ft)	104.48
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.79
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8922
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3896
Burned Peak Flow Rate (cfs)	0.3896
24-Hr Clear Runoff Volume (ac-ft)	0.0458
24-Hr Clear Runoff Volume (cu-ft)	1994.7511



Peak Flow Hydrologic Analysis

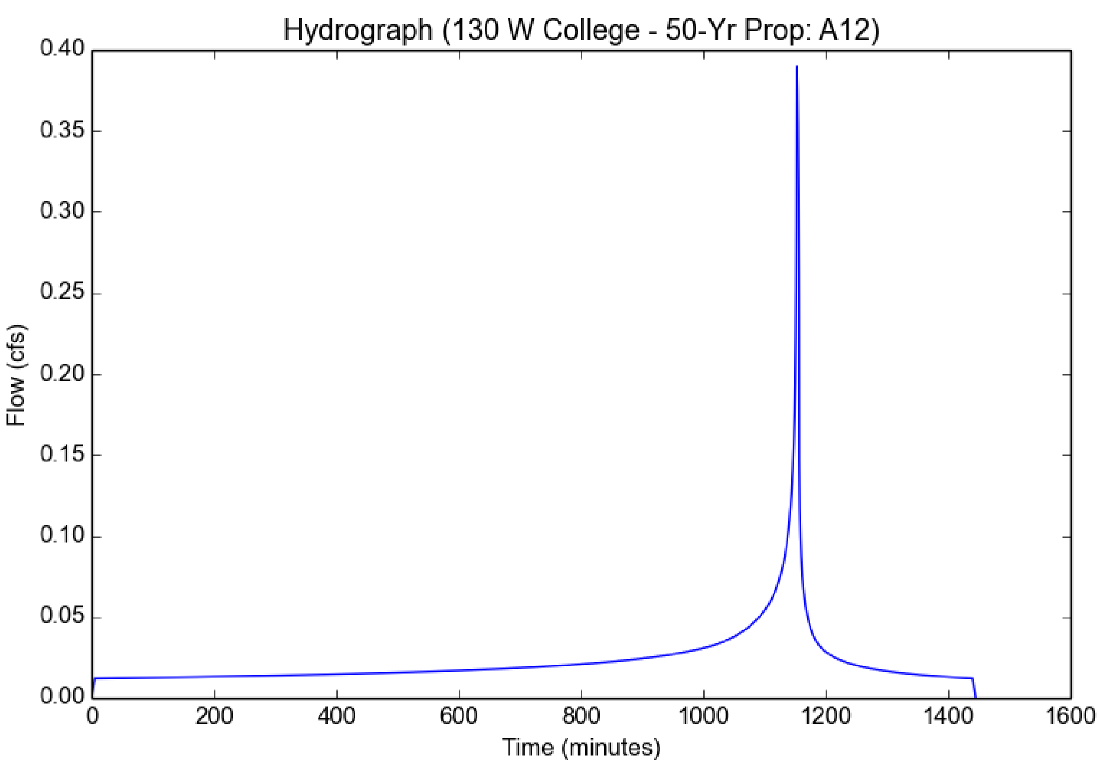
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A12
Area (ac)	0.12
Flow Path Length (ft)	104.26
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8925
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3898
Burned Peak Flow Rate (cfs)	0.3898
24-Hr Clear Runoff Volume (ac-ft)	0.0462
24-Hr Clear Runoff Volume (cu-ft)	2012.7001



Peak Flow Hydrologic Analysis

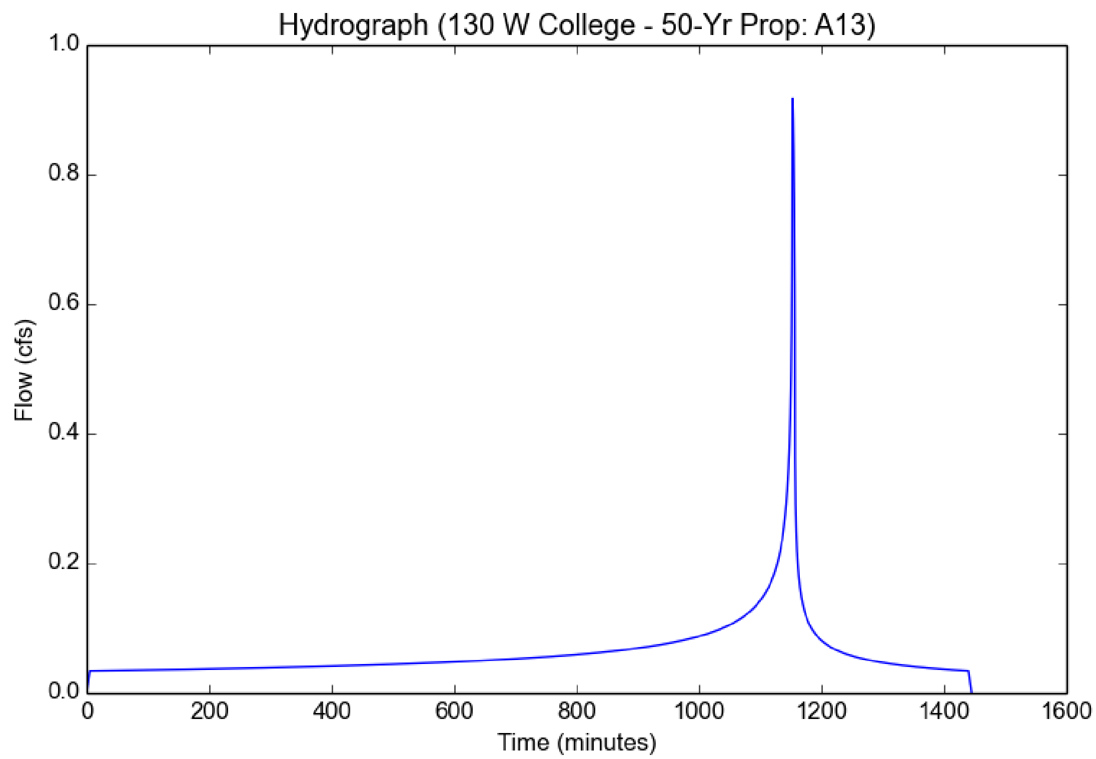
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 50-Yr Prop
Subarea ID	A13
Area (ac)	0.28
Flow Path Length (ft)	116.31
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.9171
Burned Peak Flow Rate (cfs)	0.9171
24-Hr Clear Runoff Volume (ac-ft)	0.127
24-Hr Clear Runoff Volume (cu-ft)	5533.9217



Peak Flow Hydrologic Analysis

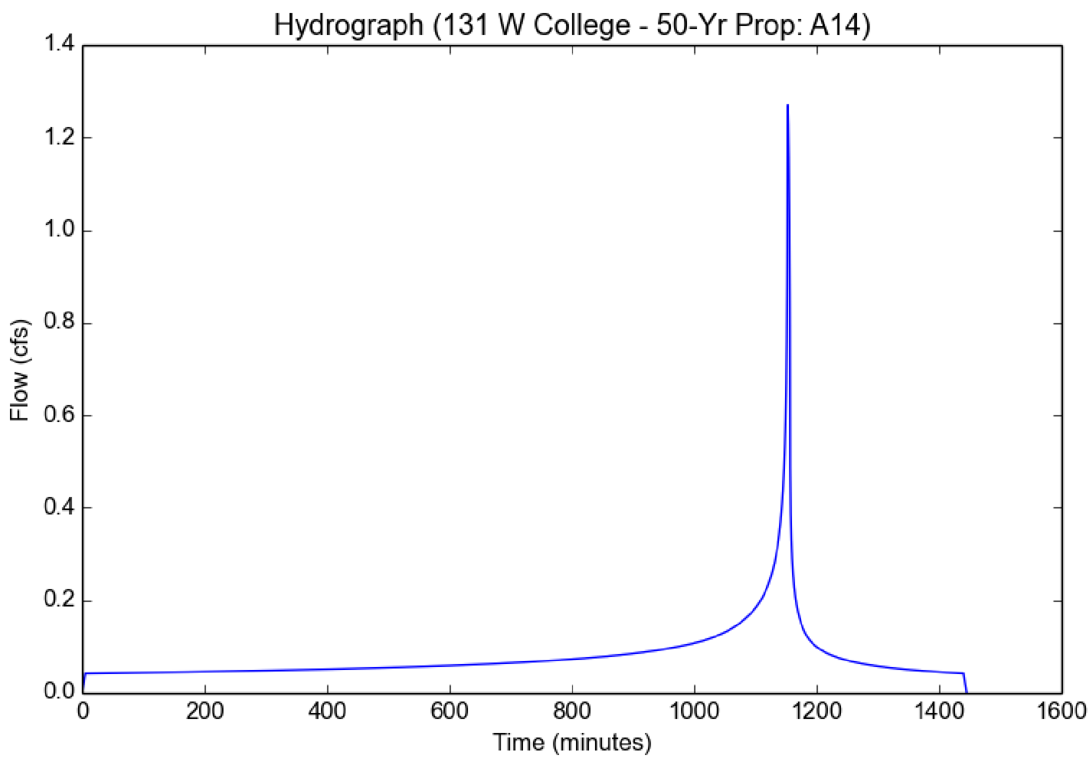
File location: C:/Users/mwong/Desktop/130 W College - 50 Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	131 W College - 50-Yr Prop
Subarea ID	A14
Area (ac)	0.39
Flow Path Length (ft)	132.95
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.87
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8627
Developed Runoff Coefficient (Cd)	0.8952
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.2706
Burned Peak Flow Rate (cfs)	1.2706
24-Hr Clear Runoff Volume (ac-ft)	0.1595
24-Hr Clear Runoff Volume (cu-ft)	6949.6159



APPENDIX F

Proposed HydroCalc Hydrology Results – 85th Percentile

Peak Flow Hydrologic Analysis

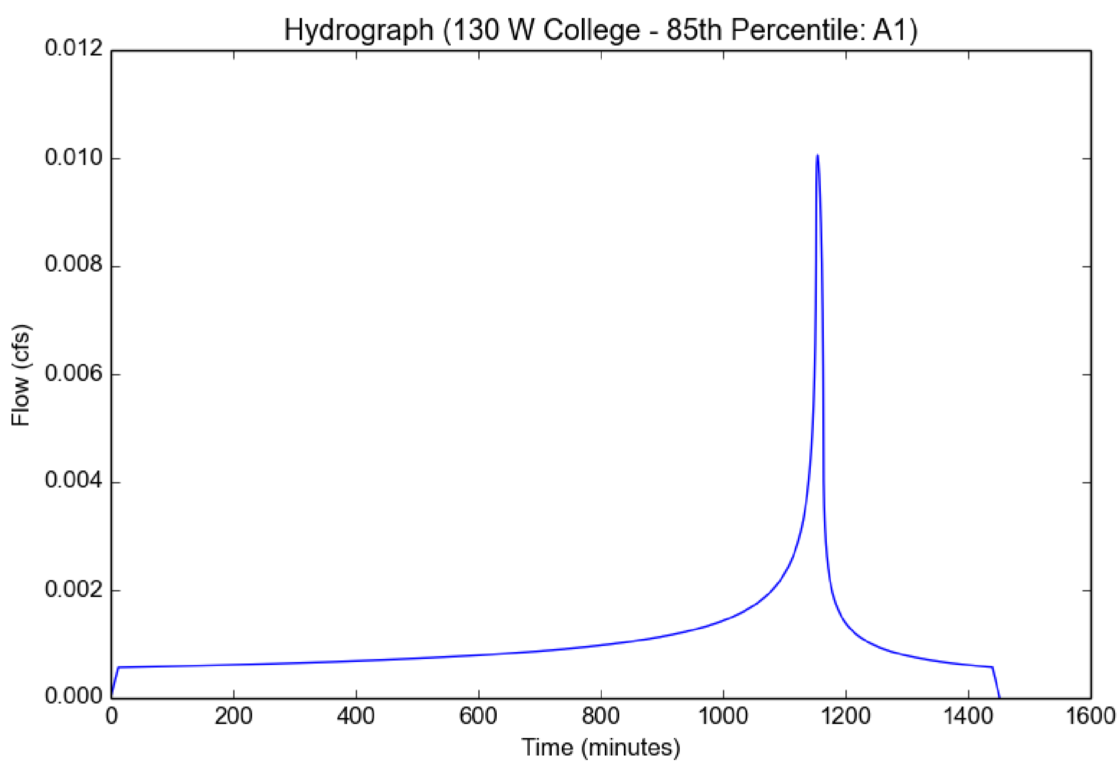
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A1
Area (ac)	0.03
Flow Path Length (ft)	101.62
Flow Path Slope (vft/hft)	0.001869
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.99
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3756
Undeveloped Runoff Coefficient (Cu)	0.1096
Developed Runoff Coefficient (Cd)	0.8921
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	0.0101
Burned Peak Flow Rate (cfs)	0.0101
24-Hr Clear Runoff Volume (ac-ft)	0.0021
24-Hr Clear Runoff Volume (cu-ft)	91.5195



Peak Flow Hydrologic Analysis

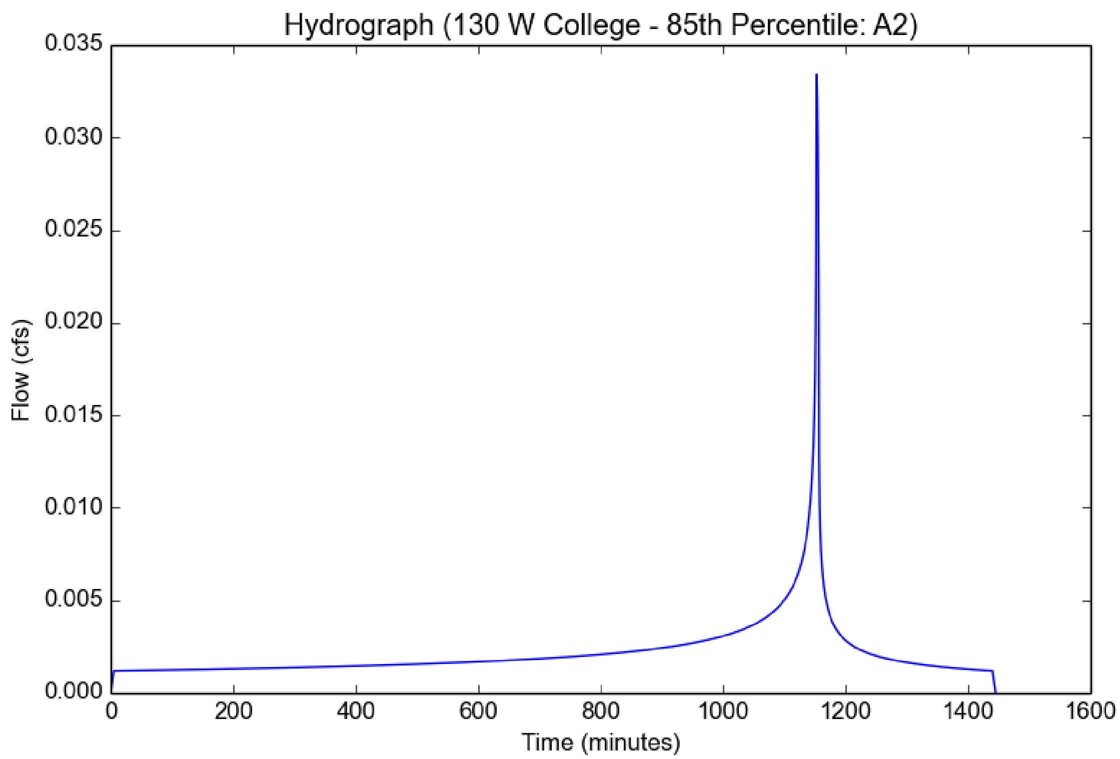
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A2
Area (ac)	0.07
Flow Path Length (ft)	31.94
Flow Path Slope (vft/hft)	0.007827175
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.89
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.5668
Undeveloped Runoff Coefficient (Cu)	0.3705
Developed Runoff Coefficient (Cd)	0.8418
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0334
Burned Peak Flow Rate (cfs)	0.0334
24-Hr Clear Runoff Volume (ac-ft)	0.0045
24-Hr Clear Runoff Volume (cu-ft)	194.6598



Peak Flow Hydrologic Analysis

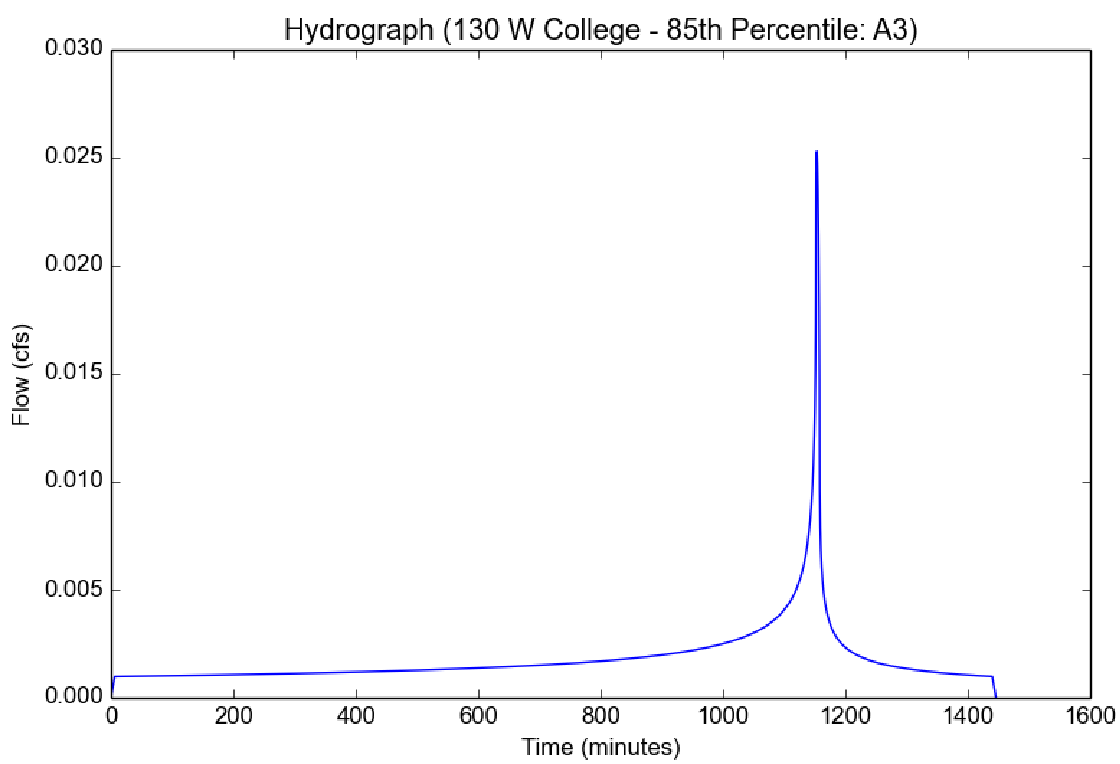
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A3
Area (ac)	0.06
Flow Path Length (ft)	52.9
Flow Path Slope (vft/hft)	0.009451796
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.84
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.5202
Undeveloped Runoff Coefficient (Cu)	0.3377
Developed Runoff Coefficient (Cd)	0.81
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	0.0253
Burned Peak Flow Rate (cfs)	0.0253
24-Hr Clear Runoff Volume (ac-ft)	0.0036
24-Hr Clear Runoff Volume (cu-ft)	158.7048



Peak Flow Hydrologic Analysis

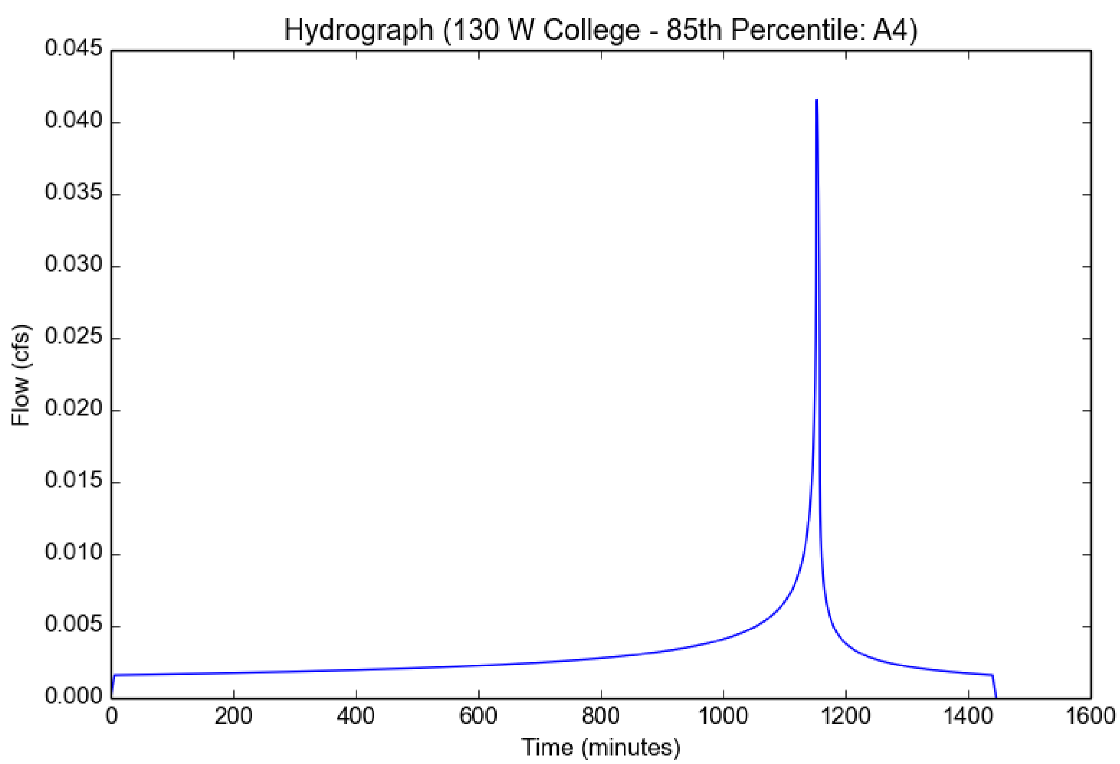
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A4
Area (ac)	0.1
Flow Path Length (ft)	45.04
Flow Path Slope (vft/hft)	0.011101243
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.82
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.5202
Undeveloped Runoff Coefficient (Cu)	0.3377
Developed Runoff Coefficient (Cd)	0.7988
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	0.0416
Burned Peak Flow Rate (cfs)	0.0416
24-Hr Clear Runoff Volume (ac-ft)	0.0059
24-Hr Clear Runoff Volume (cu-ft)	259.0965



Peak Flow Hydrologic Analysis

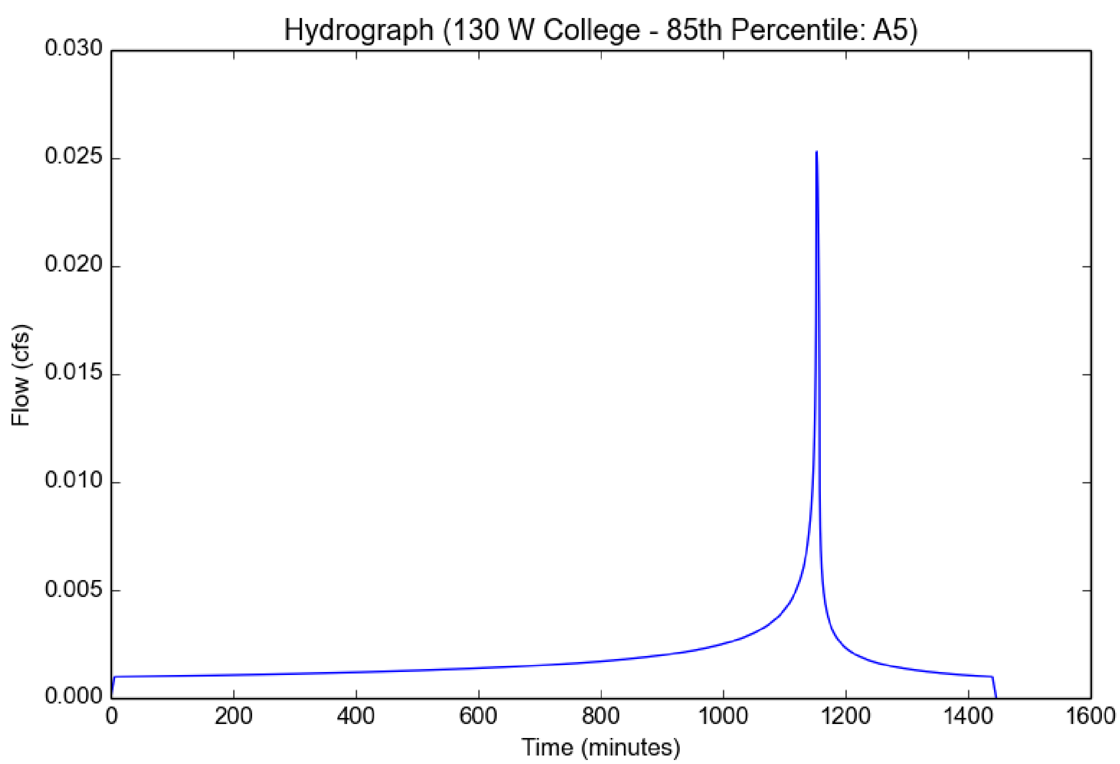
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A5
Area (ac)	0.06
Flow Path Length (ft)	50.24
Flow Path Slope (vft/hft)	0.013535032
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.84
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.5202
Undeveloped Runoff Coefficient (Cu)	0.3377
Developed Runoff Coefficient (Cd)	0.81
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	0.0253
Burned Peak Flow Rate (cfs)	0.0253
24-Hr Clear Runoff Volume (ac-ft)	0.0036
24-Hr Clear Runoff Volume (cu-ft)	158.7048



Peak Flow Hydrologic Analysis

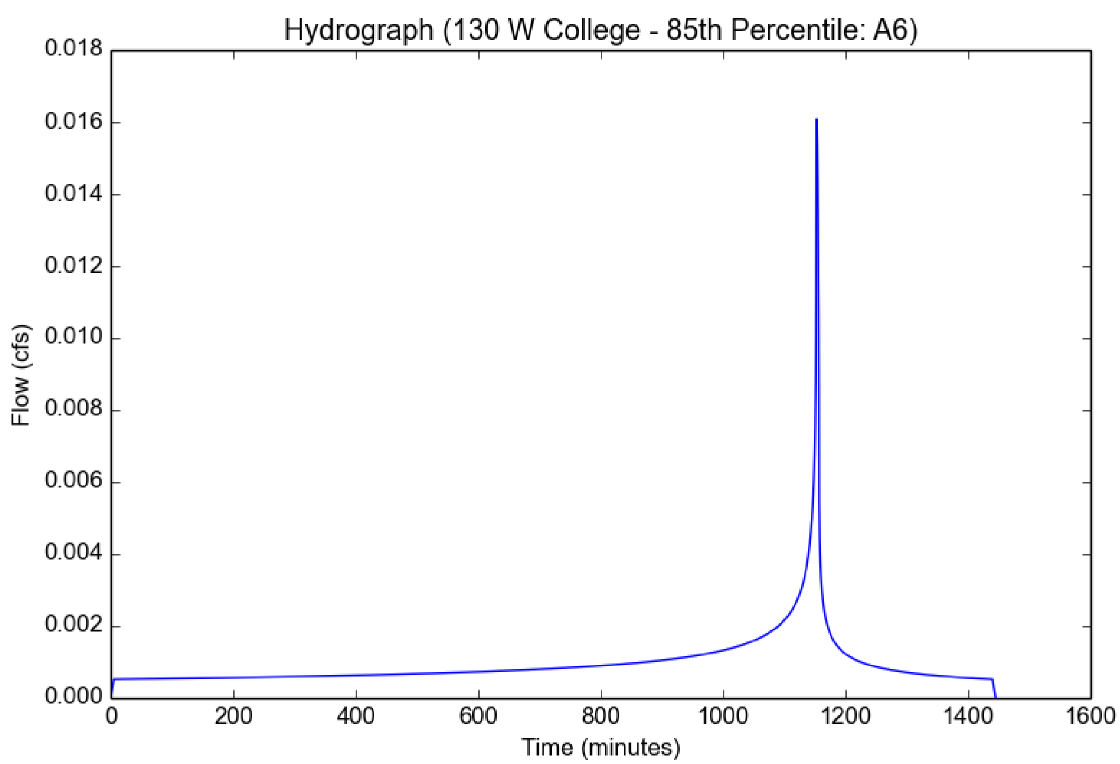
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A6
Area (ac)	0.04
Flow Path Length (ft)	20.36
Flow Path Slope (vft/hft)	0.027013
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.64
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.5668
Undeveloped Runoff Coefficient (Cu)	0.3705
Developed Runoff Coefficient (Cd)	0.7094
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0161
Burned Peak Flow Rate (cfs)	0.0161
24-Hr Clear Runoff Volume (ac-ft)	0.0019
24-Hr Clear Runoff Volume (cu-ft)	84.2209



Peak Flow Hydrologic Analysis

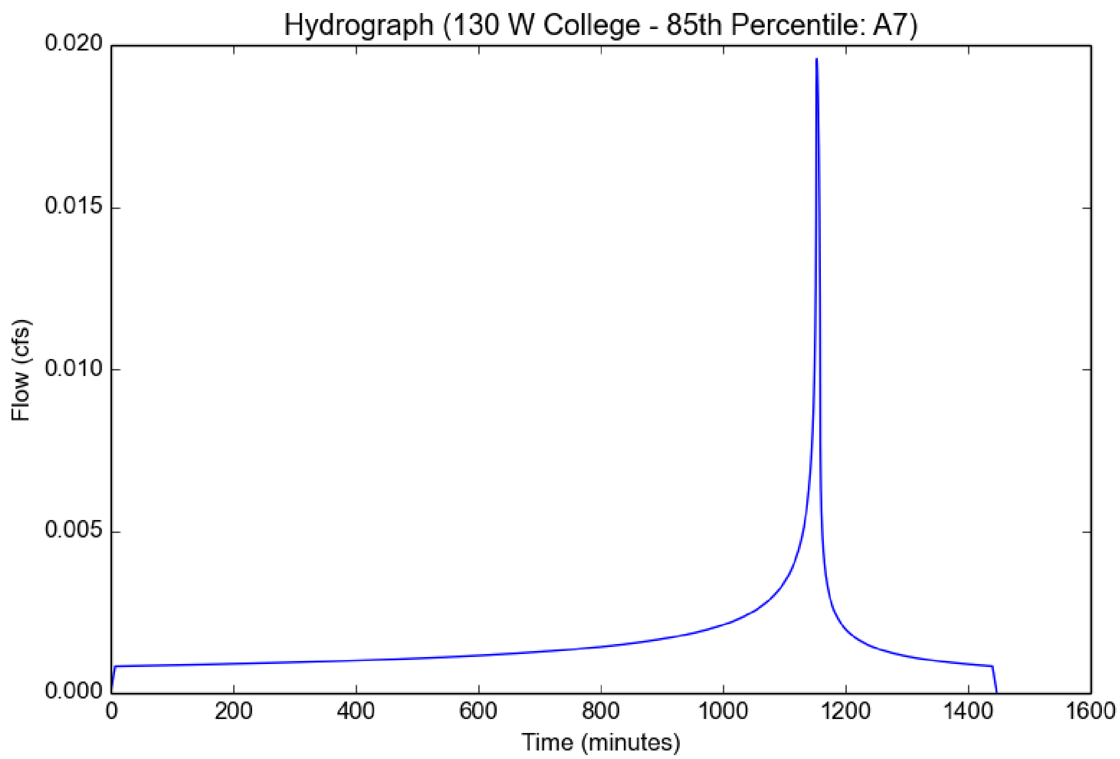
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A7
Area (ac)	0.05
Flow Path Length (ft)	71.18
Flow Path Slope (vft/hft)	0.013627
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.85
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.4839
Undeveloped Runoff Coefficient (Cu)	0.2957
Developed Runoff Coefficient (Cd)	0.8094
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	0.0196
Burned Peak Flow Rate (cfs)	0.0196
24-Hr Clear Runoff Volume (ac-ft)	0.0031
24-Hr Clear Runoff Volume (cu-ft)	133.5595



Peak Flow Hydrologic Analysis

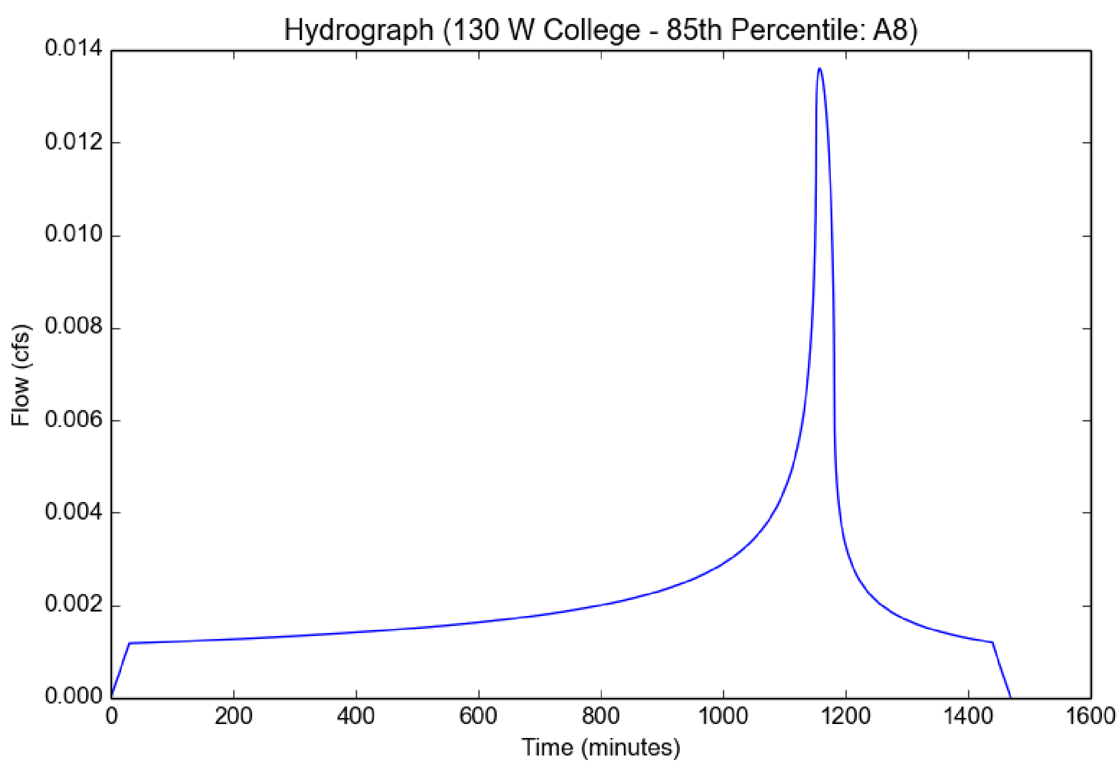
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A8
Area (ac)	0.16
Flow Path Length (ft)	250.18
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.31
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.2442
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.348
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	0.0136
Burned Peak Flow Rate (cfs)	0.0136
24-Hr Clear Runoff Volume (ac-ft)	0.0044
24-Hr Clear Runoff Volume (cu-ft)	190.4278



Peak Flow Hydrologic Analysis

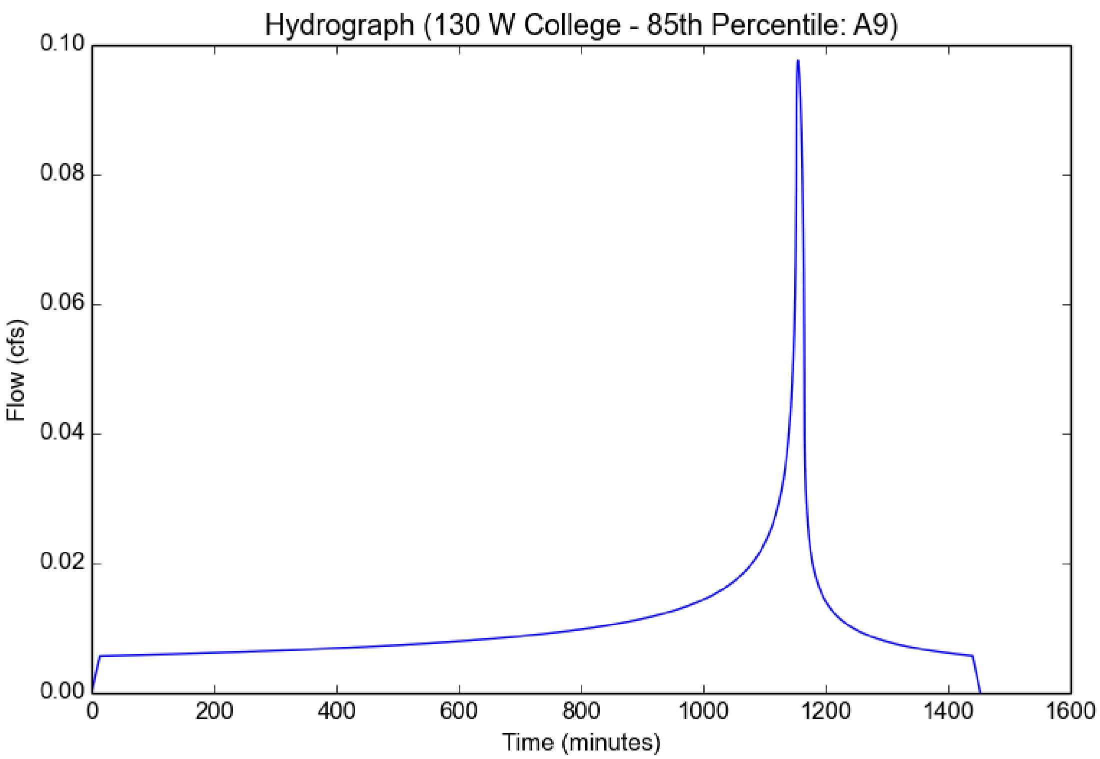
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A9
Area (ac)	0.3
Flow Path Length (ft)	187.89
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3617
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	13.0
Clear Peak Flow Rate (cfs)	0.0977
Burned Peak Flow Rate (cfs)	0.0977
24-Hr Clear Runoff Volume (ac-ft)	0.0212
24-Hr Clear Runoff Volume (cu-ft)	923.402



Peak Flow Hydrologic Analysis

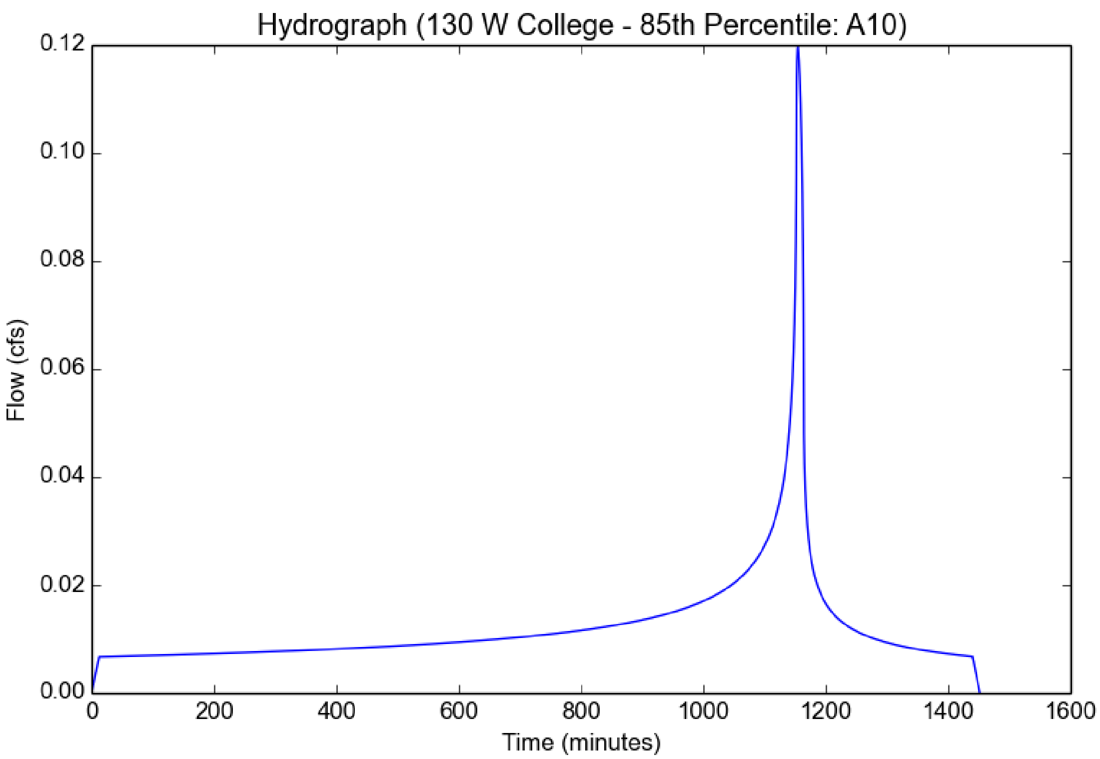
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A10
Area (ac)	0.4
Flow Path Length (ft)	140.08
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.87
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3756
Undeveloped Runoff Coefficient (Cu)	0.1096
Developed Runoff Coefficient (Cd)	0.7973
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	0.1198
Burned Peak Flow Rate (cfs)	0.1198
24-Hr Clear Runoff Volume (ac-ft)	0.025
24-Hr Clear Runoff Volume (cu-ft)	1088.9546



Peak Flow Hydrologic Analysis

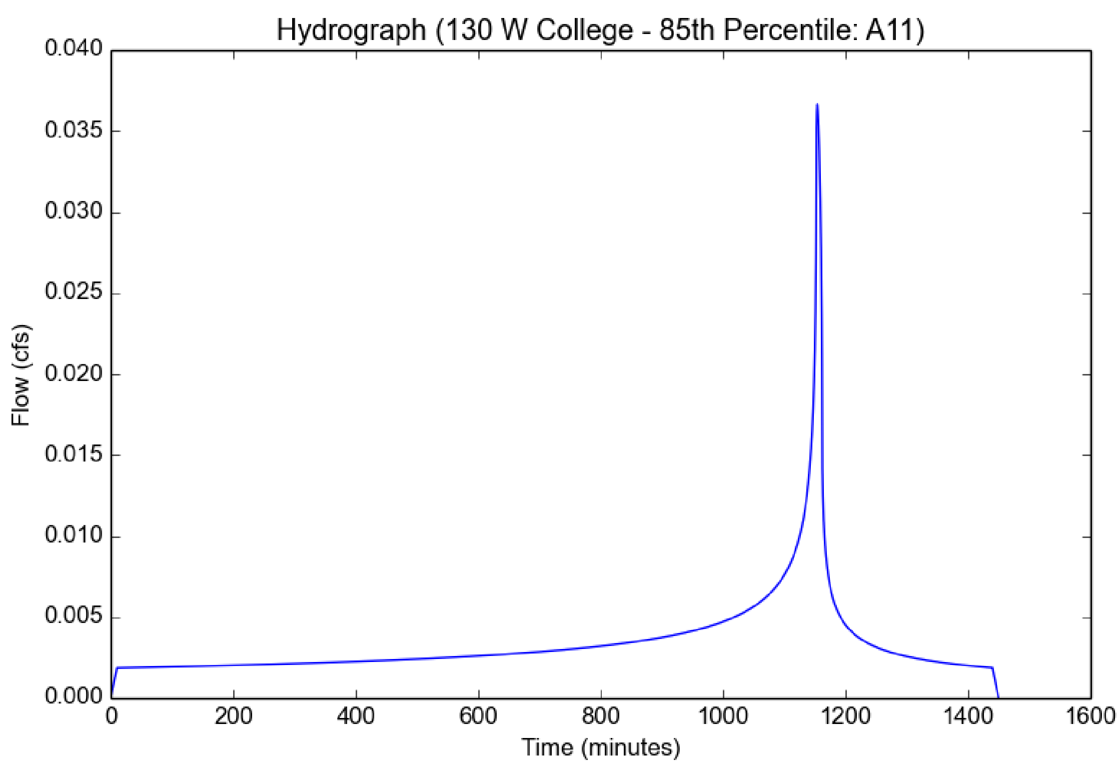
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A11
Area (ac)	0.12
Flow Path Length (ft)	104.48
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.79
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.4092
Undeveloped Runoff Coefficient (Cu)	0.1674
Developed Runoff Coefficient (Cd)	0.7461
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	0.0366
Burned Peak Flow Rate (cfs)	0.0366
24-Hr Clear Runoff Volume (ac-ft)	0.0069
24-Hr Clear Runoff Volume (cu-ft)	300.5904



Peak Flow Hydrologic Analysis

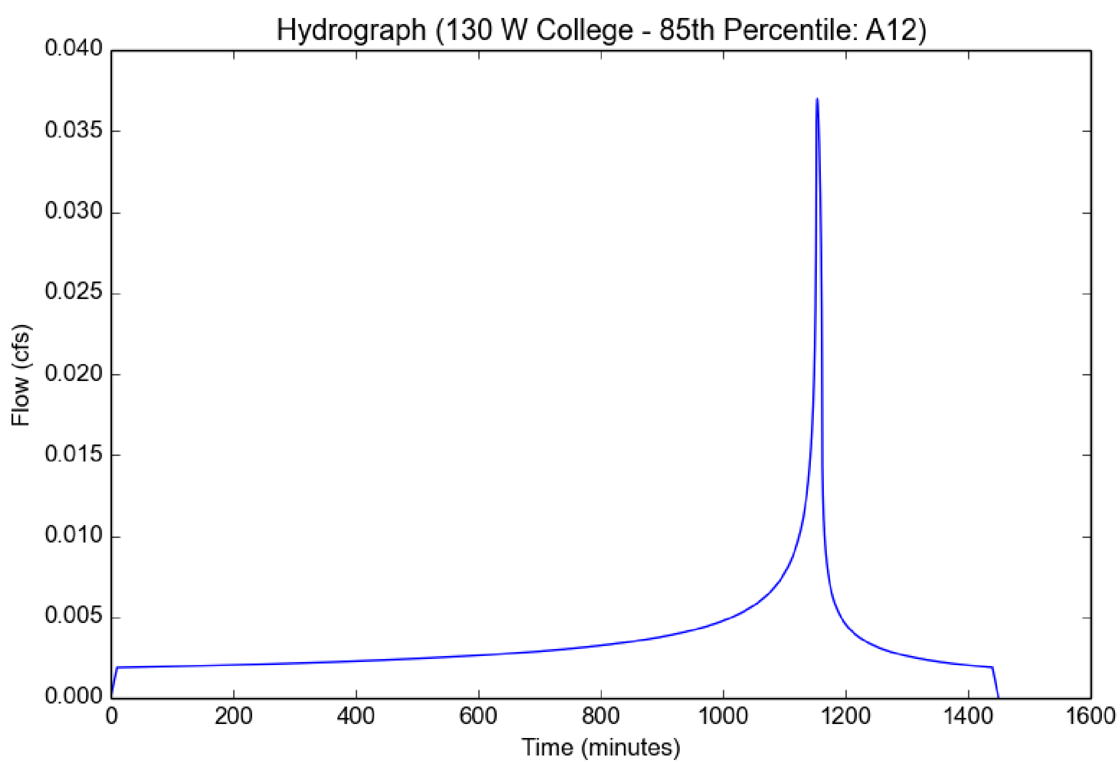
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A12
Area (ac)	0.12
Flow Path Length (ft)	104.26
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.8
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.4092
Undeveloped Runoff Coefficient (Cu)	0.1674
Developed Runoff Coefficient (Cd)	0.7535
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	0.037
Burned Peak Flow Rate (cfs)	0.037
24-Hr Clear Runoff Volume (ac-ft)	0.007
24-Hr Clear Runoff Volume (cu-ft)	303.8651



Peak Flow Hydrologic Analysis

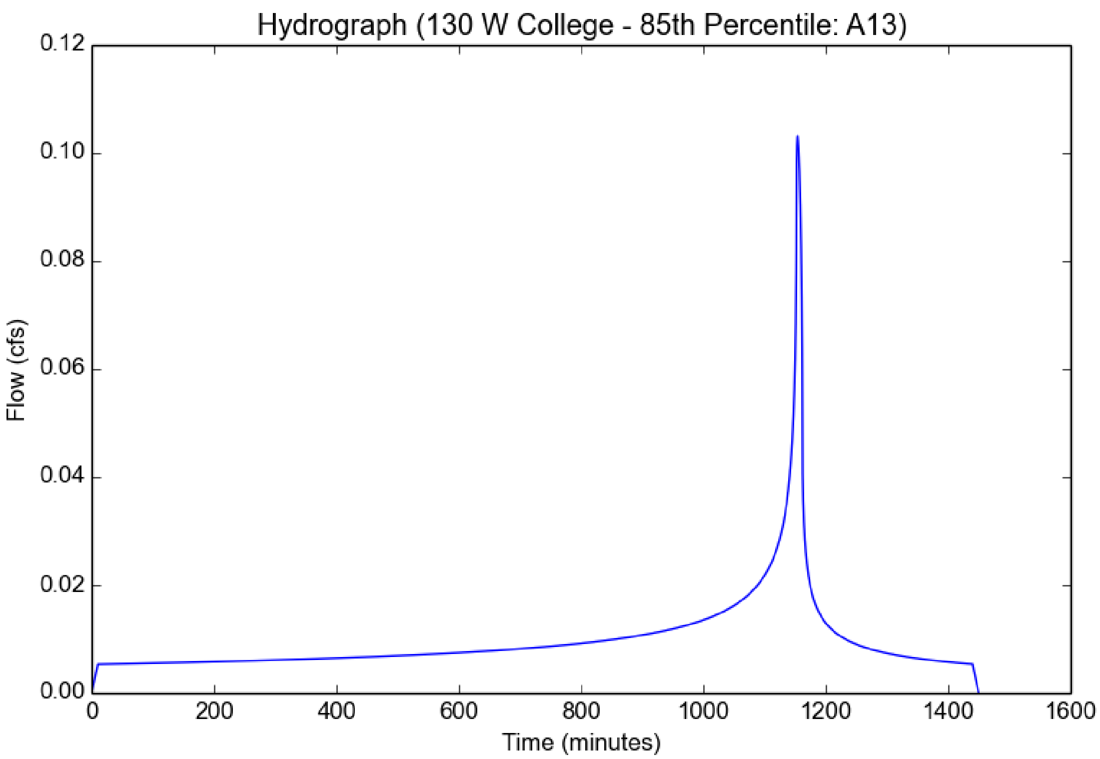
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A13
Area (ac)	0.28
Flow Path Length (ft)	116.31
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.4092
Undeveloped Runoff Coefficient (Cu)	0.1674
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	0.1031
Burned Peak Flow Rate (cfs)	0.1031
24-Hr Clear Runoff Volume (ac-ft)	0.0198
24-Hr Clear Runoff Volume (cu-ft)	861.8411



Peak Flow Hydrologic Analysis

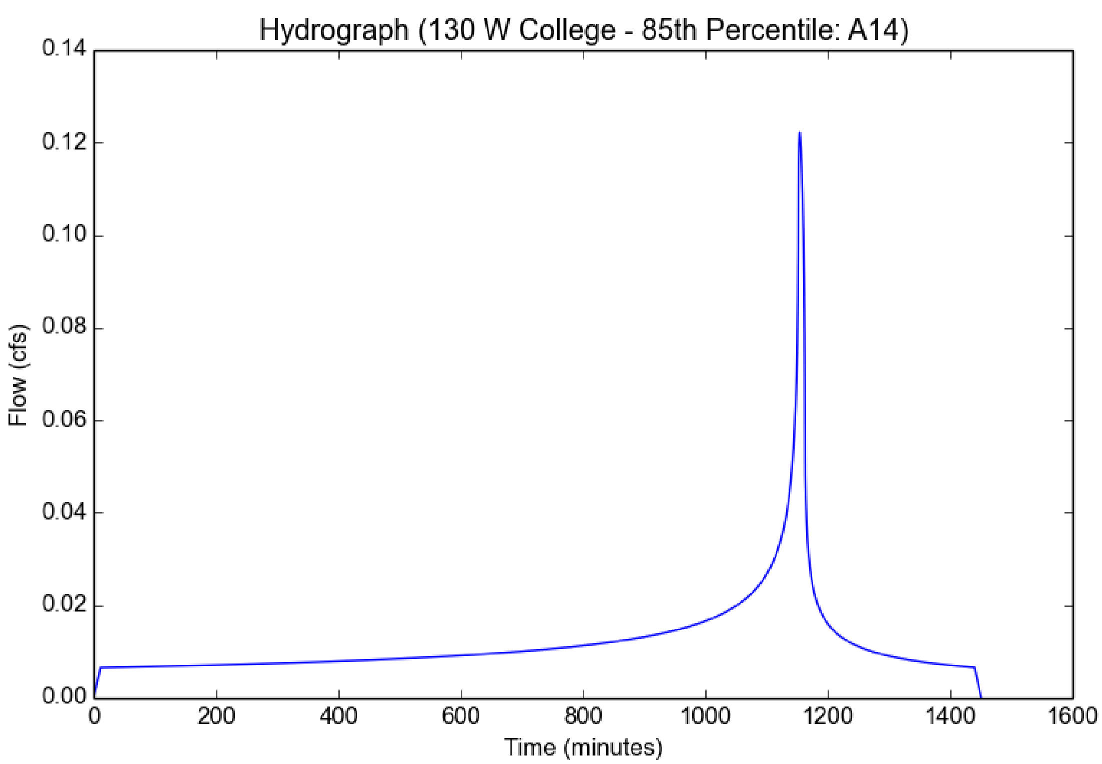
File location: C:/Users/mwong/Desktop/130 W College - 85th Percentile Report (2024-01-30).pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	130 W College - 85th Percentile
Subarea ID	A14
Area (ac)	0.39
Flow Path Length (ft)	132.95
Flow Path Slope (vft/hft)	0.01
85th Percentile Rainfall Depth (in)	0.95
Percent Impervious	0.87
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	0.95
Peak Intensity (in/hr)	0.3913
Undeveloped Runoff Coefficient (Cu)	0.1366
Developed Runoff Coefficient (Cd)	0.8008
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	0.1222
Burned Peak Flow Rate (cfs)	0.1222
24-Hr Clear Runoff Volume (ac-ft)	0.0244
24-Hr Clear Runoff Volume (cu-ft)	1061.8665



APPENDIX G

Proposed LID Calculations

Capture and Reuse

DMA ID:	**Phase 1**	
BMP No.:	**1**	
DMA Area:	**1.32**	**acres**

Project Name: 130 W College
Location: Los Angeles, CA

Notes

DESIGN CAPTURE VOLUME (DCV)		
Total Area (A)	57,392	ft^2
Impervious Area (A_I)	48,755	ft^2
Pervious Area (A_P)	8,637	ft^2
Undeveloped Area (A_u)	0	ft^2
85th Percentile Rainfall Depth (P)	0.95	inches
V_0 =	**3,542**	**cubic feet**

$V_m = (P/12 \text{ ft}) \times [(A_I)(0.9)+(A_P+A_U)(0.1)]$

Capture and Reuse

DMA ID:	**Phase 2**	
BMP No.:	**2**	
DMA Area:	**0.89**	**acres**

Project Name: 130 W College
Location: Los Angeles, CA

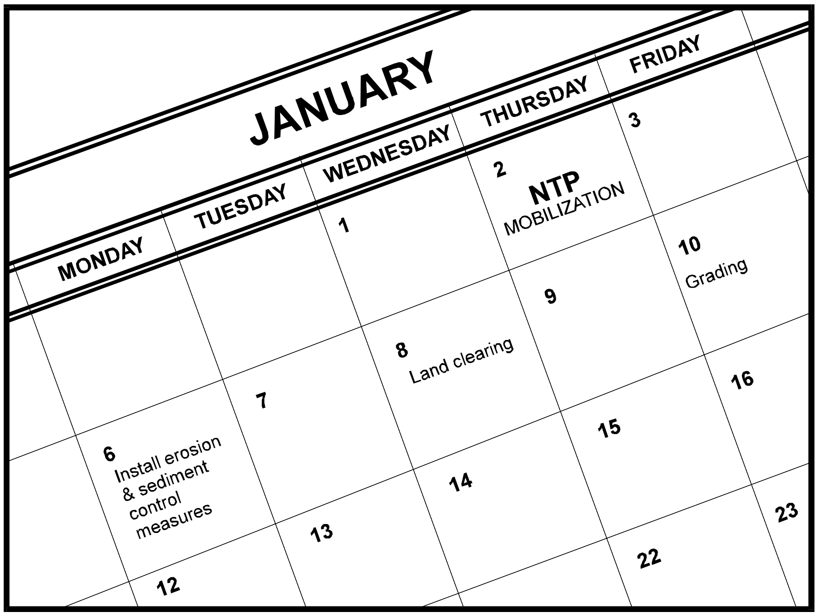
Notes

DESIGN CAPTURE VOLUME (DCV)		
Total Area (A)	38,885	ft^2
Impervious Area (A_I)	32,904	ft^2
Pervious Area (A_P)	5,981	ft^2
Undeveloped Area (A_u)	0	ft^2
85th Percentile Rainfall Depth (P)	0.95	inches
V_0 =	**2,392**	**cubic feet**

$V_m = (P/12 \text{ ft}) \times [(A_I)(0.9)+(A_P+A_U)(0.1)]$

APPENDIX H

Typical SWPPP BMPs



Description and Purpose

Scheduling is the development of a written plan that includes sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking local climate (rainfall, wind, etc.) into consideration. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

Suitable Applications

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project especially during rainy season. Use of other, more costly yet less effective, erosion and sediment control BMPs may often be reduced through proper construction sequencing.

Limitations

- Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

Implementation

- Avoid rainy periods. Schedule major grading operations during dry months when practical. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install sediment trapping devices.

- Plan the project and develop a schedule showing each phase of construction. Clearly show how the rainy season relates

Categories

EC	Erosion Control	☑
SE	Sediment Control	☒
TC	Tracking Control	☒
WE	Wind Erosion Control	☒
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

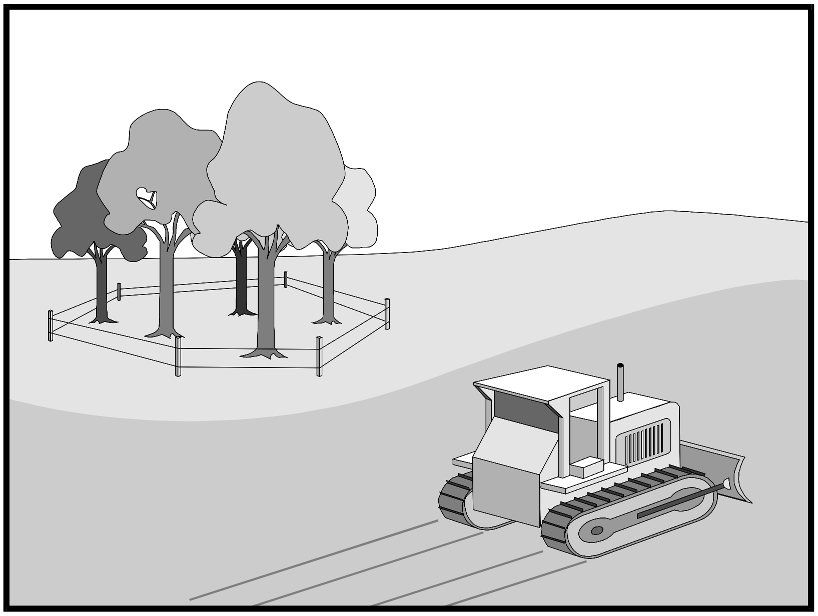
Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Preservation Of Existing Vegetation EC-2



Categories

EC	Erosion Control	☑
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Description and Purpose

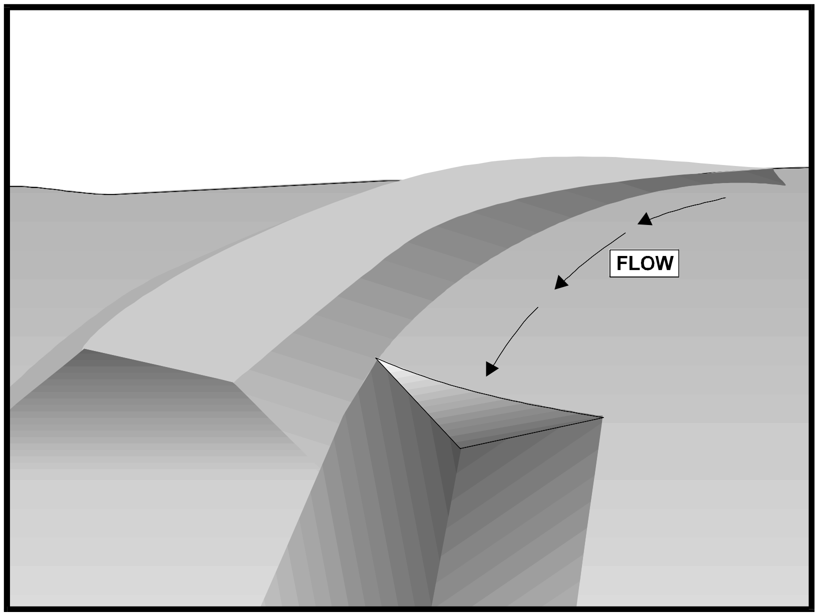
Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion.

Suitable Applications

Preservation of existing vegetation is suitable for use on most projects. Large project sites often provide the greatest opportunity for use of this BMP. Suitable applications include the following:

- Areas within the site where no construction activity occurs, or occurs at a later date. This BMP is especially suitable to multi year projects where grading can be phased.
- Areas where natural vegetation exists and is designated for preservation. Such areas often include steep slopes, watercourse, and building sites in wooded areas.
- Areas where local, state, and federal government require preservation, such as vernal pools, wetlands, marshes, certain oak trees, etc. These areas are usually designated on the plans, or in the specifications, permits, or environmental documents.
- Where vegetation designated for ultimate removal can be temporarily preserved and be utilized for erosion control and sediment control.

Earth Dikes and Drainage Swales EC-9



Categories

EC	Erosion Control	☑
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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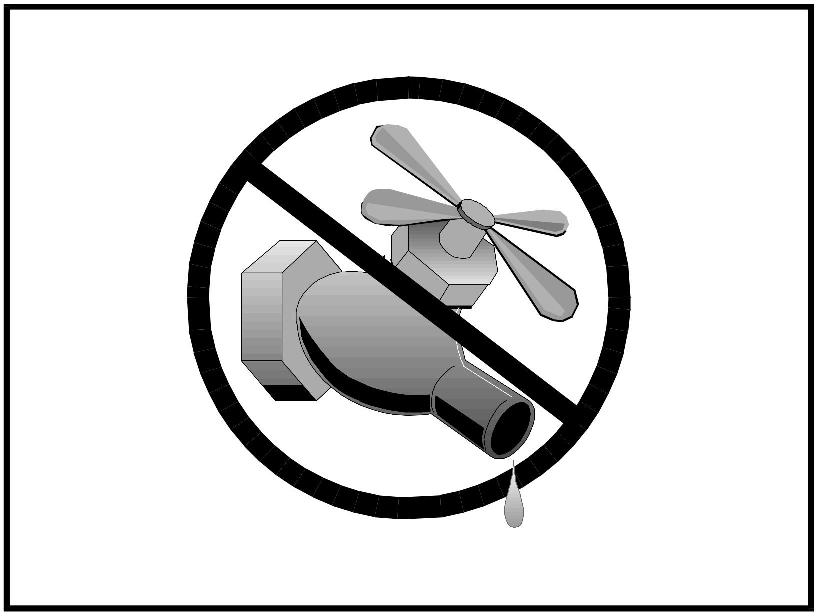
Description and Purpose

An earth dike is a temporary berm or ridge of compacted soil used to divert runoff or channel water to a desired location. A drainage swale is a shaped and sloped depression in the soil surface used to convey runoff to a desired location. Earth dikes and drainage swales are used to divert off site runoff around the construction site, divert runoff from stabilized areas and disturbed areas, and direct runoff into sediment basins or traps.

Suitable Applications

Earth dikes and drainage swales are suitable for use, individually or together, where runoff needs to be diverted from one area and conveyed to another.

- Earth dikes and drainage swales may be used:
  - To convey surface runoff down sloping land
  - To intercept and divert runoff to avoid sheet flow over sloped surfaces
  - To divert and direct runoff towards a stabilized watercourse, drainage pipe or channel
  - To intercept runoff from paved surfaces
  - Below steep grades where runoff begins to concentrate
  - Along roadways and facility improvements subject to flood drainage



Categories

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

If User/Subscriber modifies this fact sheet in any way, the CASQA name/logo and footer below must be removed from each page and not appear on the modified version.

Description and Purpose

Water conservation practices are activities that use water during the construction of a project in a manner that avoids causing erosion and the transport of pollutants offsite. These practices can reduce or eliminate non-stormwater discharges.

Suitable Applications

Water conservation practices are suitable for all construction sites where water is used, including piped water, metered water, trucked water, and water from a reservoir.

Limitations

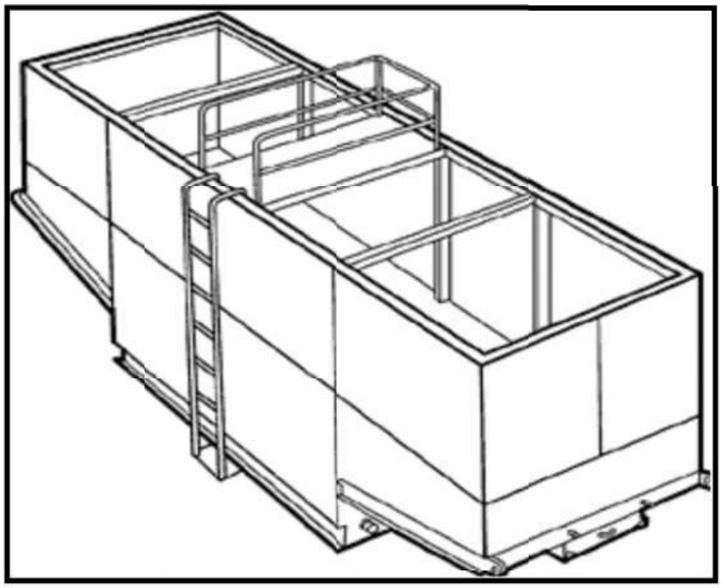
- None identified.

Implementation

- Keep water equipment in good working condition.
- Stabilize water truck filling area.
- Repair water leaks promptly.
- Washing of vehicles and equipment on the construction site is discouraged.
- Avoid using water to clean construction areas. If water must be used for cleaning or surface preparation, surface should be swept and vacuumed first to remove dirt. This will minimize amount of water required.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Dewatering Operations NS-2



Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Description and Purpose

Dewatering operations are practices that manage the discharge of pollutants when non-stormwater and accumulated precipitation (stormwater) must be removed from a work location to proceed with construction work or to provide vector control.

The General Permit incorporates Numeric Action Levels (NAL) for turbidity (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Discharges from dewatering operations can contain high levels of fine sediment that, if not properly treated, could lead to exceedances of the General Permit requirements or Basin Plan standards.

The dewatering operations described in this fact sheet are not Active Treatment Systems (ATS) and do not include the use of chemical coagulations, chemical flocculation or electrocoagulation.

Suitable Applications

These practices are implemented for discharges of non-stormwater from construction sites. Non-stormwaters include, but are not limited to, groundwater, water from cofferdams, water diversions, and waters used during construction activities that must be removed from a work area to facilitate construction.

Practices identified in this section are also appropriate for implementation when managing the removal of accumulated

Targeted Constituents

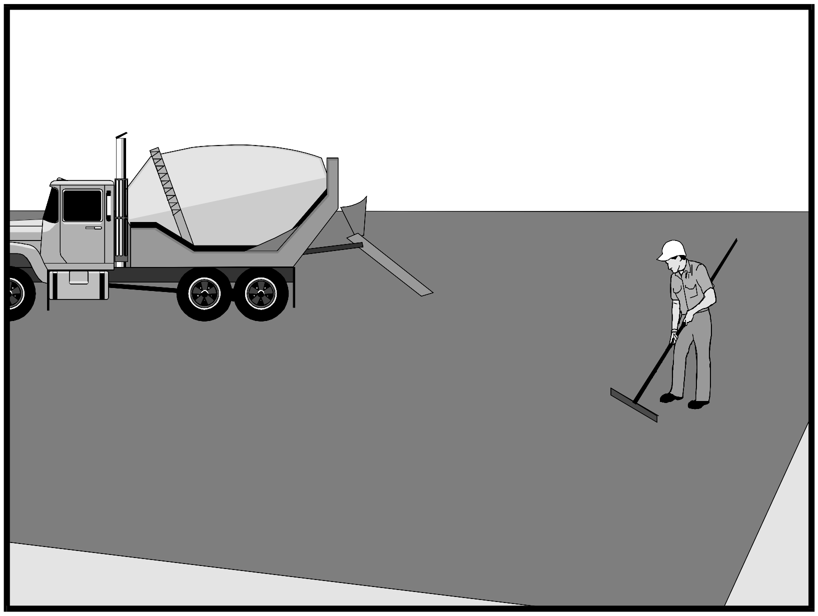
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

SE-5: Fiber Roll

SE-6: Gravel Bag Berm

Paving and Grinding Operations NS-3



Categories

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SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☒

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent runon and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

The General Permit incorporates Numeric Action Levels (NAL) for pH and turbidity (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Many types of construction materials associated with paving and grinding operations, including mortar, concrete, and cement and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows, which could lead to exceedances of the General Permit requirements.

Suitable Applications

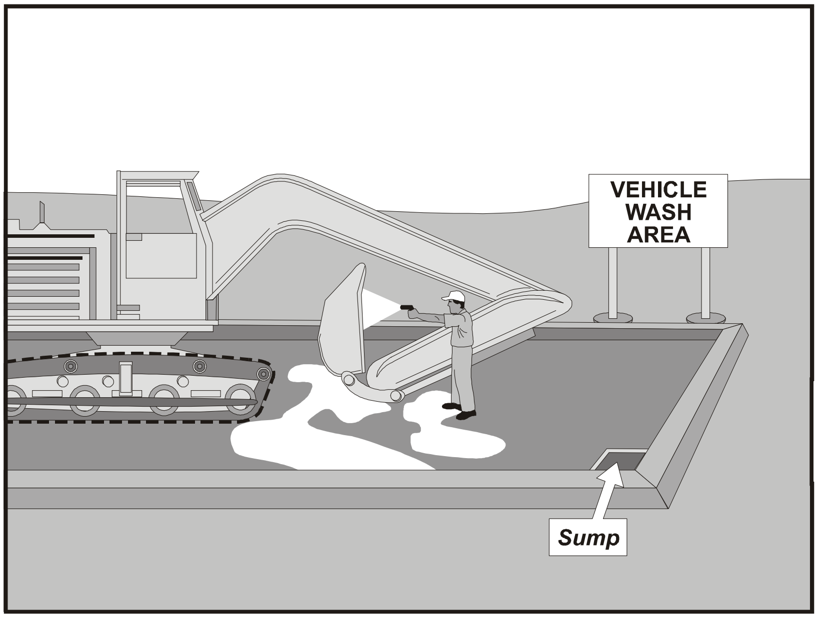
These procedures are implemented where paving, surfacing, resurfacing, or sawcutting, may pollute stormwater runoff or discharge to the storm drain system or watercourses.

Limitations

- Paving opportunities may be limited during wet weather.

  Discharges of freshly paved surfaces may raise pH to environmentally harmful levels and trigger permit violations.

Vehicle and Equipment Cleaning NS-8



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment cleaning is performed.

Limitations

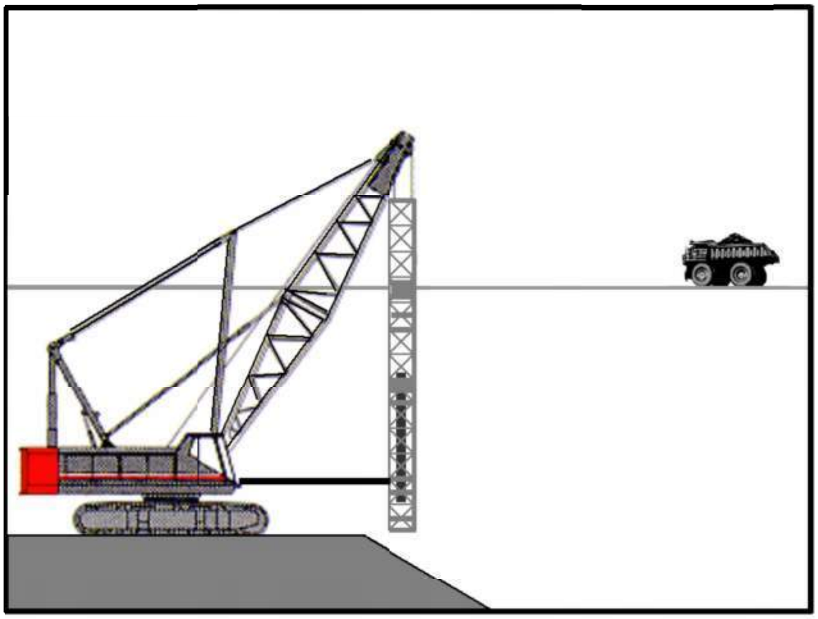
Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

Implementation

Other options to washing equipment onsite include contracting with either an offsite or mobile commercial washing business. These businesses may be better equipped to handle and dispose of the wash waters properly. Performing this work offsite can also be economical by eliminating the need for a separate washing operation onsite.

If washing operations are to take place onsite, then:

Pile Driving Operations NS-11



Description and Purpose

The construction and retrofit of bridges and retaining walls often include driving piles for foundation support and shoring operations. Driven piles are typically constructed of precast concrete, steel, or timber. Driven sheet piles are also used for shoring and cofferdam construction. Proper control and use of equipment, materials, and waste products from pile driving operations will reduce or eliminate the discharge of potential pollutants to the storm drain system, watercourses, and waters of the United States.

Suitable Applications

These procedures apply to all construction sites near or adjacent to a watercourse or groundwater where permanent and temporary pile driving (impact and vibratory) takes place, including operations using pile shells as well as construction of cast-in-steel-shell and cast-in-drilled-hole piles.

Limitations

None identified.

Implementation

- Use drip pans or absorbent pads during vehicle and equipment operation, maintenance, cleaning, fueling, and storage. Refer to NS-8, Vehicle and Equipment Cleaning, NS-9, Vehicle and Equipment Fueling, and NS-10, Vehicle and Equipment Maintenance.

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

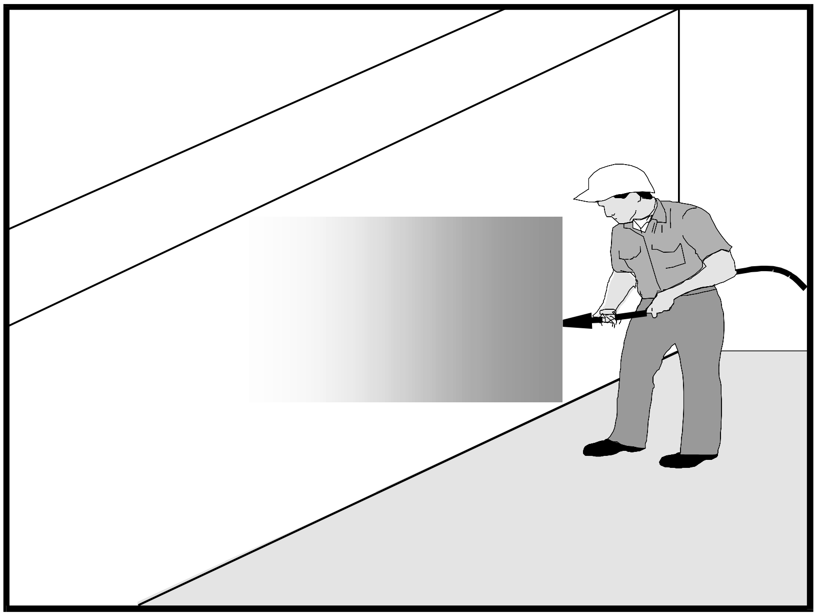
Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Concrete Curing NS-12



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Concrete curing is used in the construction of structures such as bridges, retaining walls, pump houses, large slabs, and structured foundations. Concrete curing includes the use of both chemical and water methods.

Concrete and its associated curing materials have basic chemical properties that can raise the pH of water to levels outside of the permitted range. Discharges of stormwater and non-stormwater exposed to concrete during curing may have a high pH and may contain chemicals, metals, and fines. The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Proper procedures and care should be taken when managing concrete curing materials to prevent them from coming into contact with stormwater flows, which could result in a high pH discharge.

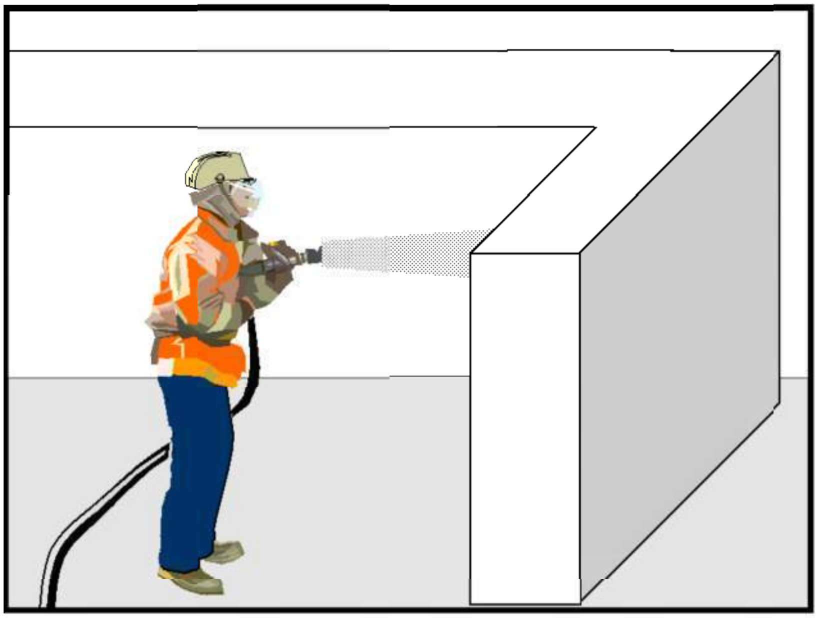
Suitable Applications

Suitable applications include all projects where Portland Cement Concrete (PCC) and concrete curing chemicals are placed where they can be exposed to rainfall, runoff from other areas, or where runoff from the PCC will leave the site.

Limitations

- Runoff contact with concrete waste can raise pH levels in the water to environmentally harmful levels and trigger permit violations.

Concrete Finishing NS-13



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	☑

Potential Alternatives

None

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Description and Purpose

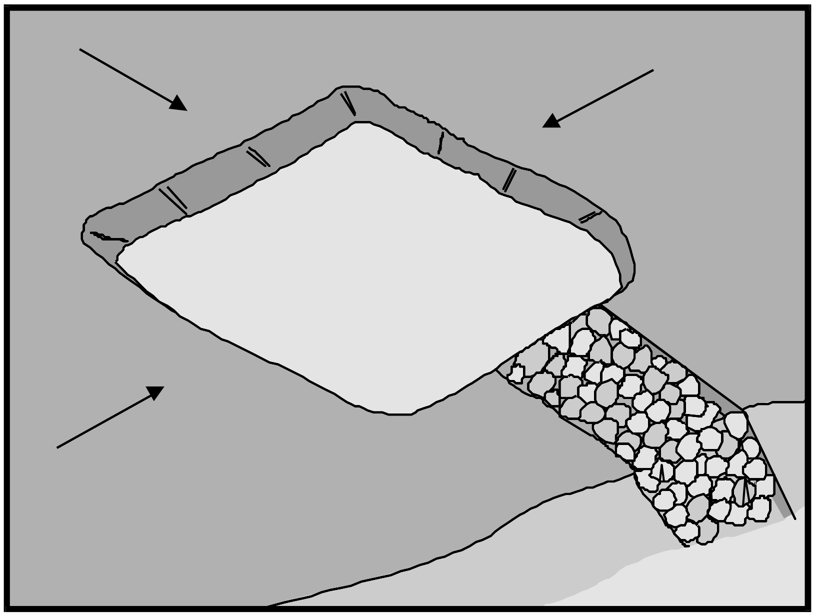
Concrete finishing methods are used for bridge deck rehabilitation, paint removal, curing compound removal, and final surface finish appearances. Methods include sand blasting, shot blasting, grinding, or high pressure water blasting. Stormwater and non-stormwater exposed to concrete finishing by-products may have a high pH and may contain chemicals, metals, and fines. Proper procedures and implementation of appropriate BMPs can minimize the impact that concrete-finishing methods may have on stormwater and non-stormwater discharges.

The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Concrete and its associated curing materials have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows, which could lead to exceedances of the General Permit requirements.

Suitable Applications

These procedures apply to all construction locations where concrete finishing operations are performed.



Categories

EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-2 Sediment Basin (for larger areas)

Description and Purpose

A sediment trap is a containment area where sediment-laden runoff is temporarily detained under quiescent conditions, allowing sediment to settle out or before the runoff is discharged by gravity flow. Sediment traps are formed by excavating or constructing an earthen embankment across a waterway or low drainage area.

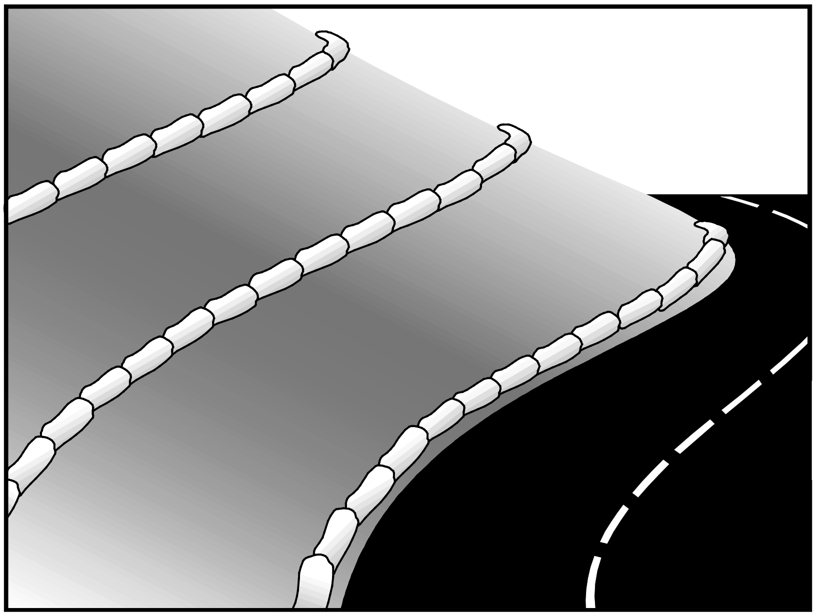
Trap design guidance provided in this fact sheet is not intended to guarantee compliance with numeric discharge limits (numeric action levels or numeric effluent limits for turbidity). Compliance with discharge limits requires a thoughtful approach to comprehensive BMP planning, implementation, and maintenance. Therefore, optimally designed and maintained sediment traps should be used in conjunction with a comprehensive system of BMPs.

Suitable Applications

Sediment traps should be considered for use:

- At the perimeter of the site at locations where sediment-laden runoff is discharged offsite.
- At multiple locations within the project site where sediment control is needed.
- Around or upslope from storm drain inlet protection measures.
- Sediment traps may be used on construction projects where the drainage area is less than 5 acres. Traps would be

Gravel Bag Berm SE-6



Categories

EC	Erosion Control	☒
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Roll

SE-8 Sandbag Barrier

SE-12 Temporary Silt Dike

SE-14 Biofilter Bags

Description and Purpose

A gravel bag berm is a series of gravel-filled bags placed on a level contour to intercept sheet flows. Gravel bags pond sheet flow runoff, allowing sediment to settle out, and release runoff slowly as sheet flow, preventing erosion.

Suitable Applications

Gravel bag berms may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As a linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.

Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways, and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

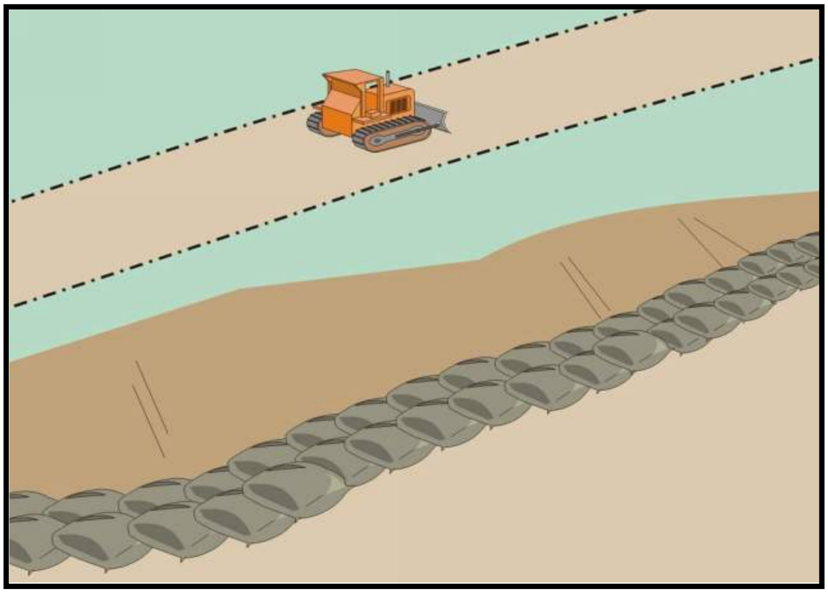
Limitations

Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).

Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts to be focused, and perhaps save money.
- Inspect potential sediment tracking locations daily.
- Visible sediment tracking should be swept or vacuumed on a daily basis.

Sandbag Barrier SE-8



Categories

EC	Erosion Control	☒
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-12 Manufactured Linear Sediment Controls

SE-14 Biofilter Bags

Description and Purpose

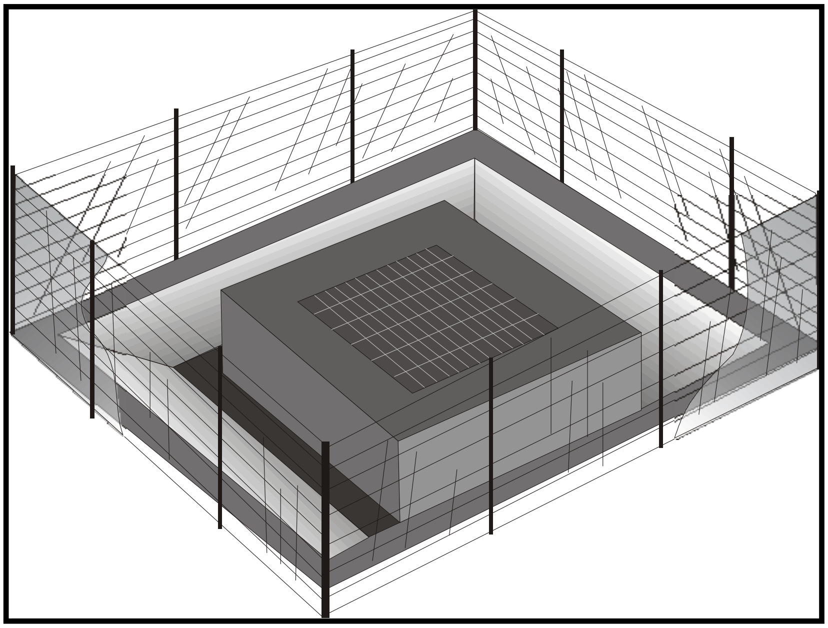
A sandbag barrier is a series of sand-filled bags placed on a level contour to intercept or to divert sheet flows. Sandbag barriers placed on a level contour pond sheet flow runoff, allowing sediment to settle out.

Suitable Applications

Sandbag barriers may be a suitable control measure for the applications described below. It is important to consider that sand bags are less porous than gravel bags and ponding or flooding can occur behind the barrier. Also, sand is easily transported by runoff if bags are damaged or ruptured. The SWPPP Preparer should select the location of a sandbag barrier with respect to the potential for flooding, damage, and the ability to maintain the BMP.

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes.
  - As sediment traps at culvert/pipe outlets.
  - Below other small cleared areas.
  - Along the perimeter of a site.
  - Down slope of exposed soil areas.
  - Around temporary stockpiles and spoil areas.
  - Parallel to a roadway to keep sediment off paved areas.
  - Along streams and channels.

Storm Drain Inlet Protection SE-10



Description and Purpose

Storm drain inlet protection consists of a sediment filter or an impounding area in, around or upstream of a storm drain, drop inlet, or curb inlet. Storm drain inlet protection measures temporarily pond runoff before it enters the storm drain, allowing sediment to settle. Some filter configurations also remove sediment by filtering, but usually the ponding action results in the greatest sediment reduction. Temporary geotextile storm drain inserts attach underneath storm drain grates to capture and filter storm water.

Suitable Applications

- Every storm drain inlet receiving runoff from unstabilized or otherwise active work areas should be protected. Inlet protection should be used in conjunction with other erosion and sediment controls to prevent sediment-laden stormwater and non-stormwater discharges from entering the storm drain system.

Limitations

- Drainage area should not exceed 1 acre.
- In general straw bales should not be used as inlet protection.
- Requires an adequate area for water to pond without encroaching into portions of the roadway subject to traffic.
- Sediment removal may be inadequate to prevent sediment discharges in high flow conditions or if runoff is heavily sediment laden. If high flow conditions are expected, use

Categories

EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☒
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

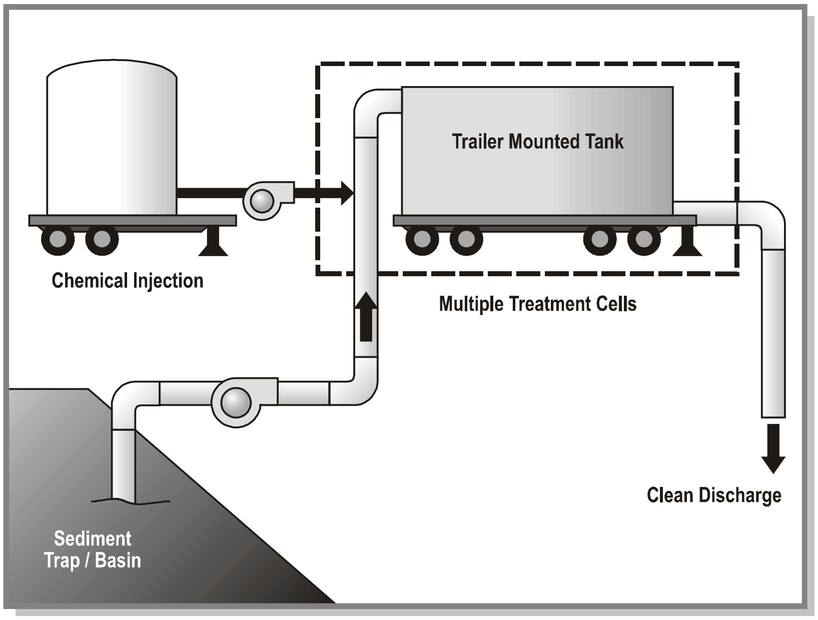
SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-14 Biofilter Bags

SE-13 Compost Socks and Berms



Categories

EC	Erosion Control	☑
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
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WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Active Treatment Systems (ATS) reduce turbidity of construction site runoff by introducing chemicals to stormwater through direct dosing or an electrical current to enhance flocculation, coagulation, and settling of the suspended sediment. Coagulants and flocculants are used to enhance settling and removal of suspended sediments and generally include inorganic salts and polymers (USACE, 2001). The increased flocculation aids in sedimentation and ability to remove fine suspended sediments, thus reducing stormwater runoff turbidity and improving water quality.

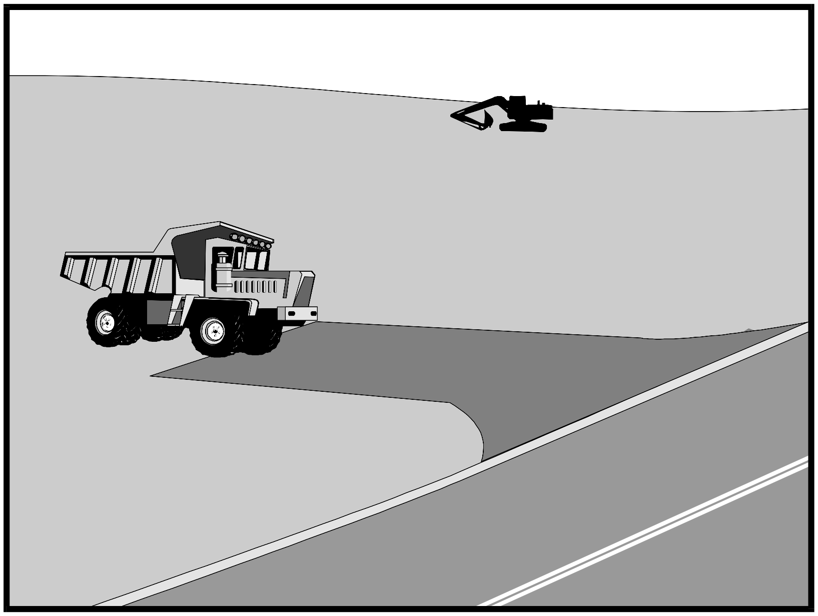
Suitable Applications

ATS can reliably provide exceptional reductions of turbidity and associated pollutants and should be considered where turbid discharges to sediment and turbidity sensitive waters cannot be avoided using traditional BMPs. Additionally, it may be appropriate to use an ATS when site constraints inhibit the ability to construct a correctly sized sediment basin, when clay and/or highly erosive soils are present, or when the site has very steep or long slope lengths.

Limitations

Dischargers choosing to utilize chemical treatment in an ATS must follow all guidelines of the Construction General Permit Attachment F – Active Treatment System Requirements. General limitations are as follows:

Stabilized Construction Entrance/Exit TC-1



Categories		
EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
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WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

Suitable Applications

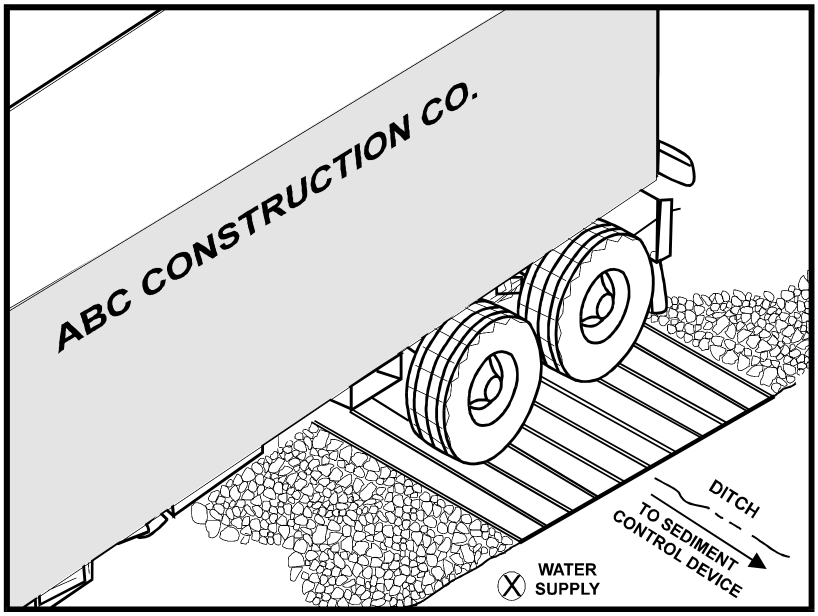
Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.

Entrance/Outlet Tire Wash TC-3



Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

TC-1 Stabilized Construction Entrance/Exit

Description and Purpose

A tire wash is an area located at stabilized construction access points to remove sediment from tires and under carriages and to prevent sediment from being transported onto public roadways.

Suitable Applications

Tire washes may be used on construction sites where dirt and mud tracking onto public roads by construction vehicles may occur.

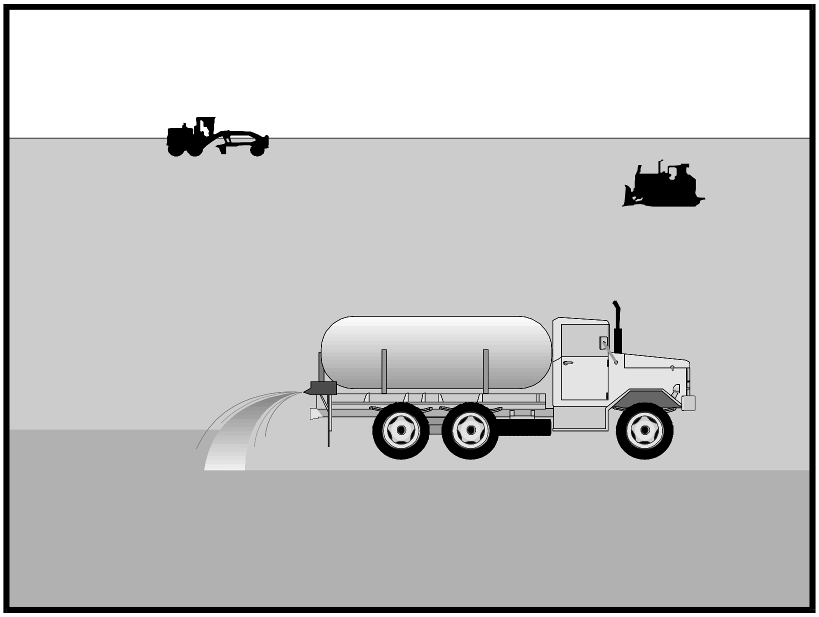
Limitations

- The tire wash requires a supply of wash water.
- A turnout or doublewide exit is required to avoid having entering vehicles drive through the wash area.
- Do not use where wet tire trucks leaving the site leave the road dangerously slick.

Implementation

- Incorporate with a stabilized construction entrance/exit. See TC-1, Stabilized Construction Entrance/Exit.
- Construct on level ground when possible, on a pad of coarse aggregate greater than 3 in. but smaller than 6 in. A geotextile fabric should be placed below the aggregate.
- Wash rack should be designed and constructed/manufactured for anticipated traffic loads.

Wind Erosion Control WE-1



Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	☑
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WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-5 Soil Binders

Description and Purpose

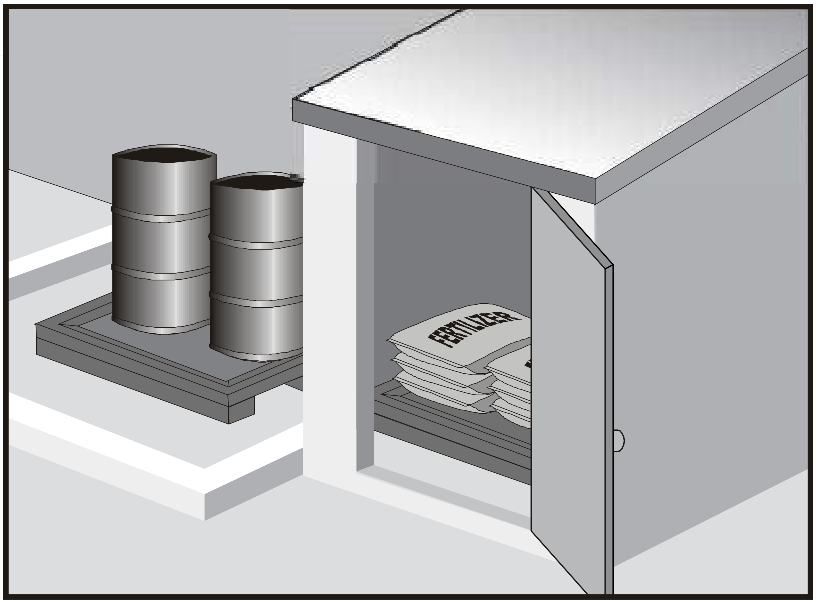
Wind erosion or dust control consists of applying water or other chemical dust suppressants as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

California's Mediterranean climate, with a short "wet" season and a typically long, hot "dry" season, allows the soils to thoroughly dry out. During the dry season, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment. Site conditions and climate can make dust control more of an erosion problem than water based erosion. Additionally, many local agencies, including Air Quality Management Districts, require dust control and/or dust control permits in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. Wind erosion control is required to be implemented at all construction sites greater than 1 acre by the General Permit.

Suitable Applications

Most BMPs that provide protection against water-based erosion will also protect against wind-based erosion and dust control requirements required by other agencies will generally meet wind erosion control requirements for water quality protection. Wind erosion control BMPs are suitable during the following construction activities:

Material Delivery and Storage WM-1



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

If User/Subscriber modifies this fact sheet in any way, the CASQA name/logo and footer below must be removed from each page and not appear on the modified version.

Description and Purpose

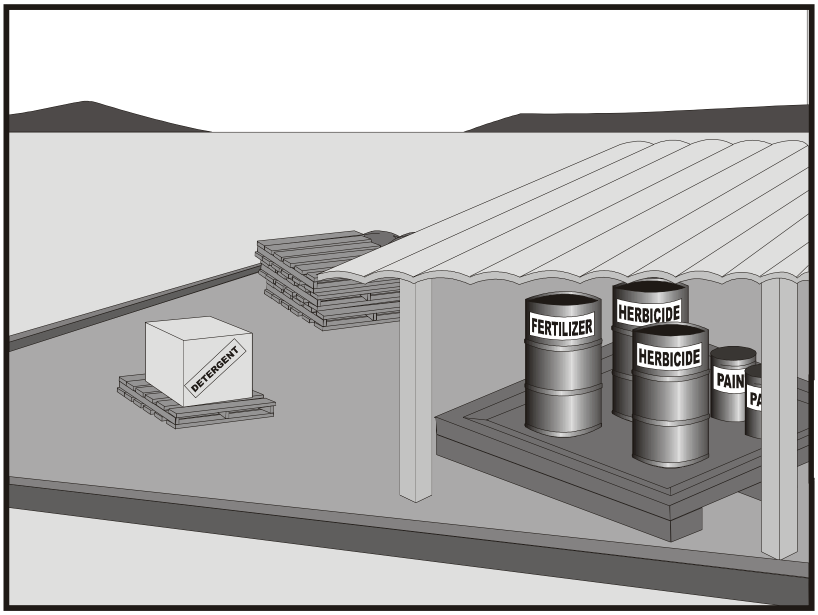
Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in watertight containers and/or a completely enclosed designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see WM-2, Material Use, or WM-4, Spill Prevention and Control. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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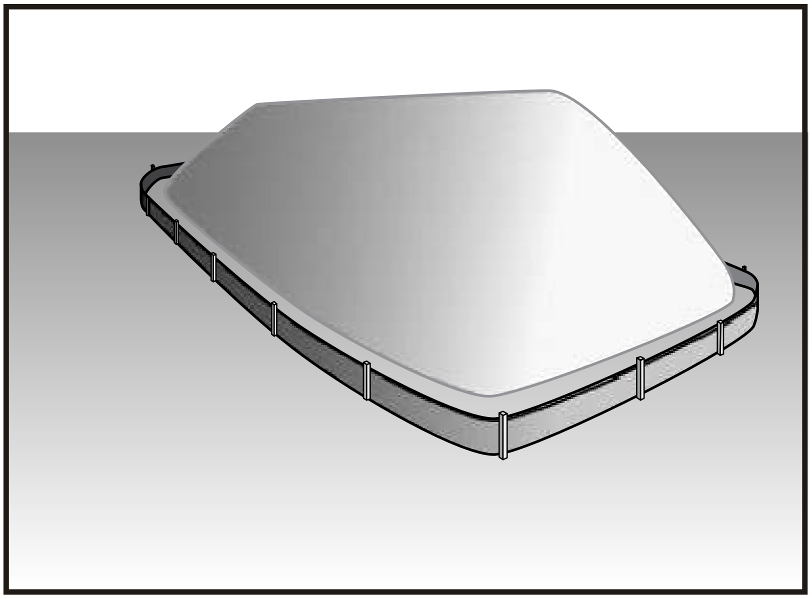
Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Other materials that may be detrimental if released to the environment



Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, soil amendments, sand, paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called "cold mix" asphalt), and pressure treated wood.

Suitable Applications

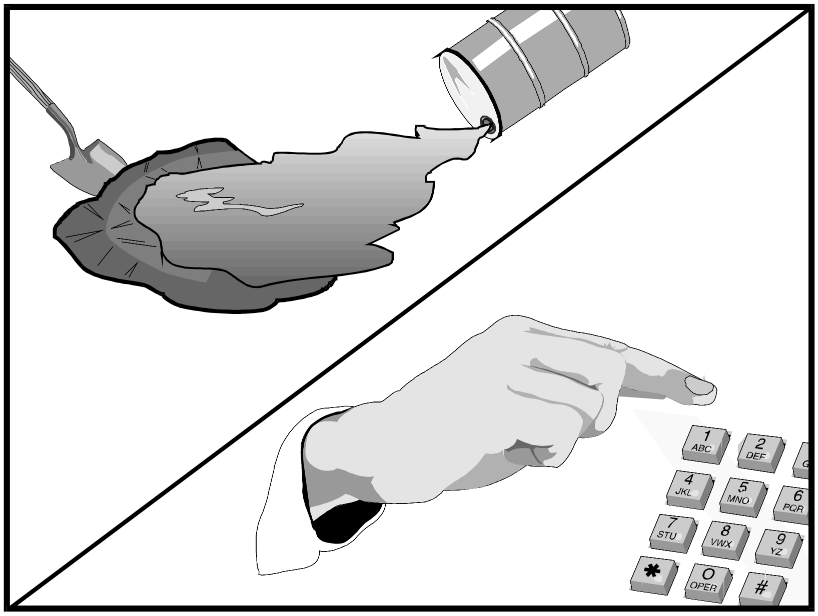
Implement in all projects that stockpile soil and other loose materials.

Limitations

- Plastic sheeting as a stockpile protection is temporary and hard to manage in windy conditions. Where plastic is used, consider use of plastic tarps with nylon reinforcement which may be more durable than standard sheeting.
- Plastic sheeting can increase runoff volume due to lack of infiltration and potentially cause perimeter control failure.
- Plastic sheeting breaks down faster in sunlight.
- The use of Plastic materials and photodegradable plastics should be avoided.

Implementation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

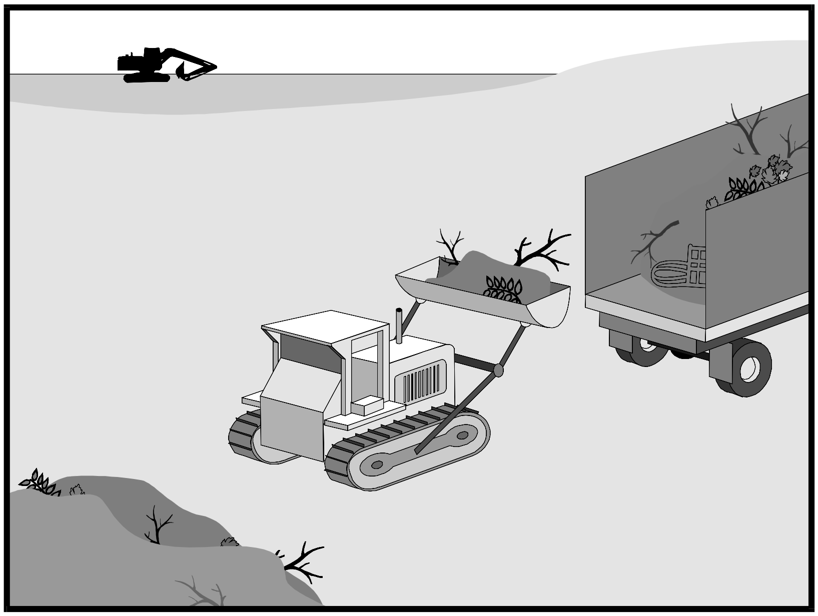
This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Dust palliatives
- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals

Solid Waste Management WM-5



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

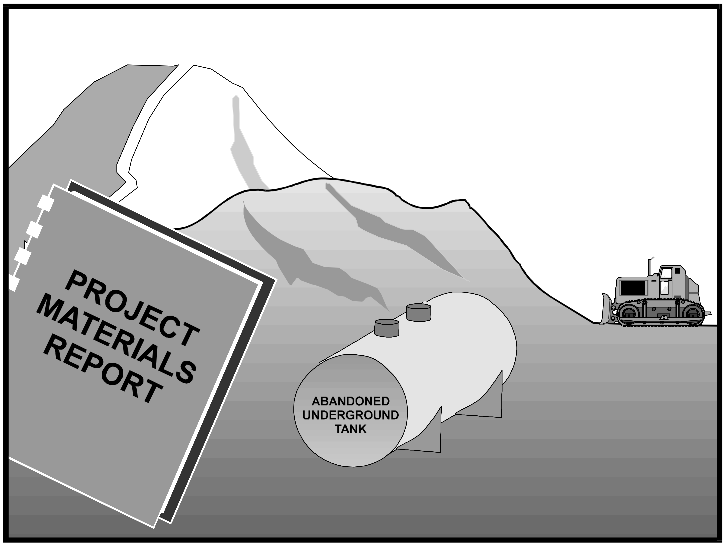
Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction
- Packaging materials including wood, paper, and plastic
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials

Contaminated Soil Management WM-7



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from contaminated soil and highly acidic or alkaline soils by conducting pre-construction surveys, inspecting excavations regularly, and remediating contaminated soil promptly.

Suitable Applications

Contaminated soil management is implemented on construction projects in highly urbanized or industrial areas where soil contamination may have occurred due to spills, illicit discharges, aerial deposition, past use and leaks from underground storage tanks.

Limitations

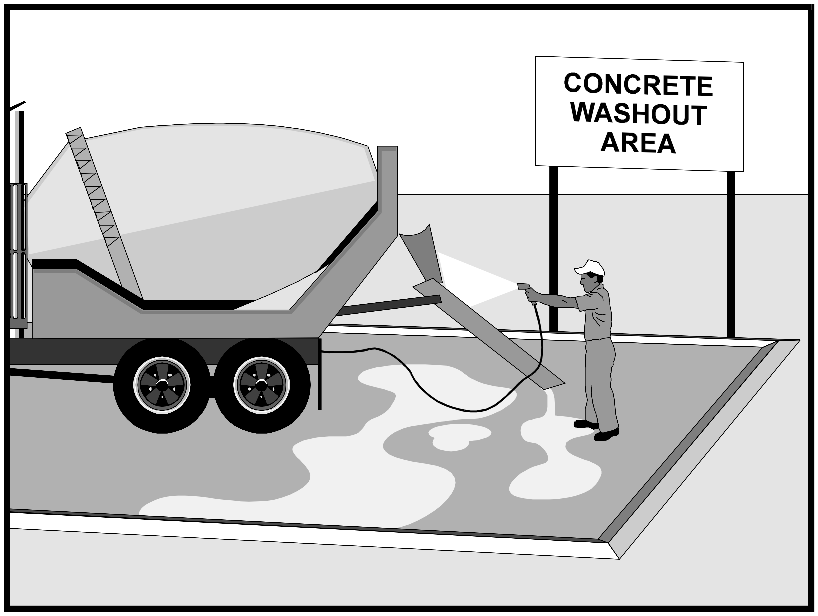
Contaminated soils that cannot be treated onsite must be disposed of offsite by a licensed hazardous waste hauler. The presence of contaminated soil may indicate contaminated water as well. See NS-2, Dewatering Operations, for more information.

The procedures and practices presented in this BMP are general. The contractor should identify appropriate practices and procedures for the specific contaminants known to exist or discovered onsite.

Implementation

Most owners and developers conduct pre-construction environmental assessments as a matter of routine. Contaminated soils are often identified during project planning and development with known locations identified in the plans, specifications and in the SWPPP. The contractor should review applicable reports and investigate appropriate call-outs in the

Concrete Waste Management WM-8



Categories

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TC	Tracking Control	
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Legend:

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☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

Description and Purpose

Prevent the discharge of pollutants to stormwater from concrete waste by conducting washout onsite or offsite in a designated area, and by employee and subcontractor training.

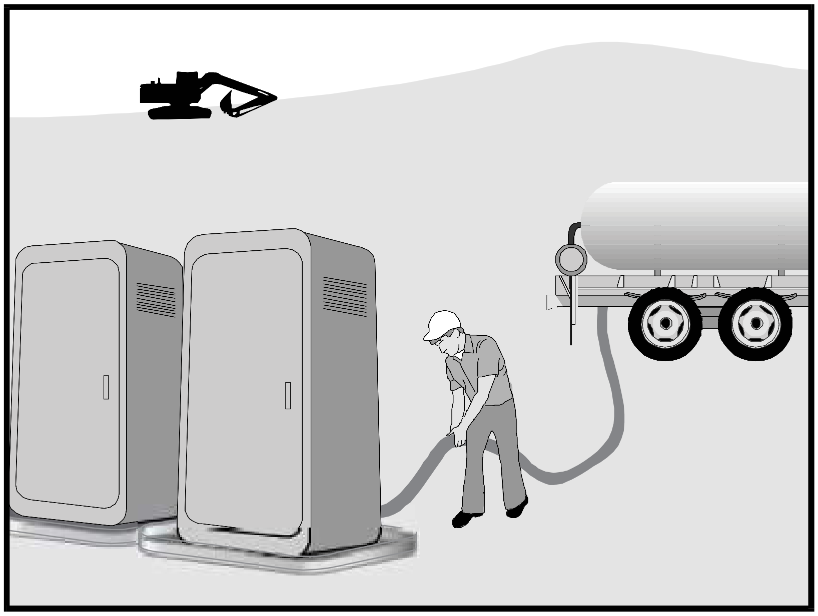
The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Many types of construction materials, including mortar, concrete, stucco, cement and block and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows and raising pH to levels outside the accepted range.

Suitable Applications

Concrete waste management procedures and practices are implemented on construction projects where:

- Concrete is used as a construction material or where concrete dust and debris result from demolition activities.
- Slurries containing portland cement concrete (PCC) are generated, such as from saw cutting, coring, grinding, grooving, and hydro-concrete demolition.
- Concrete trucks and other concrete-coated equipment are washed onsite.



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
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Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	
Nutrients	☑
Trash	☑
Metals	
Bacteria	☑
Oil and Grease	
Organics	☑

Potential Alternatives

None

Description and Purpose

Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

Suitable Applications

Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.

Limitations

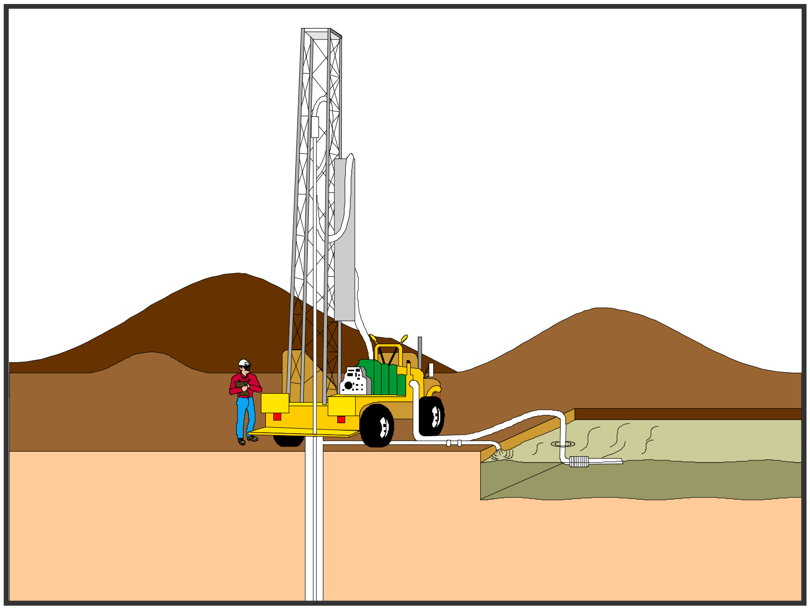
None identified.

Implementation

Sanitary or septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes are properly disposed.

Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities, watercourses, and from traffic circulation. If site conditions allow, place portable facilities a minimum of 50 feet from drainage conveyances and traffic areas. When subjected to high winds or risk of high winds, temporary sanitary facilities should be secured to prevent overturning.



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Liquid waste management includes procedures and practices to prevent discharge of pollutants to the storm drain system or to watercourses as a result of the creation, collection, and disposal of non-hazardous liquid wastes.

Suitable Applications

Liquid waste management is applicable to construction projects that generate any of the following non-hazardous by-products, residuals, or wastes:

- Drilling slurries and drilling fluids
- Grease-free and oil-free wastewater and rinse water
- Dredgings
- Other non-stormwater liquid discharges not permitted by separate permits

Limitations

- Disposal of some liquid wastes may be subject to specific laws and regulations or to requirements of other permits secured for the construction project (e.g., NPDES permits, Army Corps permits, Coastal Commission permits, etc.).
- Liquid waste management does not apply to dewatering operations (NS-2 Dewatering Operations), solid waste management (WM-5, Solid Waste Management), hazardous wastes (WM-6, Hazardous Waste Management), or