Appendix I

Water Resources Technical Report

1111 SUNSET

WATER RESOURCES TECHNICAL REPORT
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1. INTRODUCTION

1.1. PROJECT DESCRIPTION

The 1111 Sunset Project (Project) is a mixed-use development proposed to be constructed on a 6.27-acre site (Project Site) that is currently developed with four vacant structures that are situated generally in the center and along the western area of the lot and the Elysian apartment building situated generally along the northern portion of the lot, which is not part of the Project. The Project Site also includes surface parking and circulation areas generally located on the eastern half of the Project Site. The Project proposes two potential development scenarios—the Mixed Use Development Scenario and the No-Hotel Development Scenario. Under the Mixed Use Development Scenario, up to 737 residential units (including up to 76 restricted affordable housing units), up to 180 hotel rooms, up to 48,000 square feet of office space, and up to 95,000 square feet of general commercial floor area are proposed. Under the No-Hotel Development Scenario, a maximum of up to 827 residential units (including up to 76 restricted affordable housing units) would be constructed along with up to 48,000 square feet of office space, and up to 95,000 square feet of general commercial floor area. The additional residential units (under the No-Hotel Development Scenario) would be located in the Sunset Building and would replace the 180 hotel rooms proposed by the Mixed Use Development Scenario. The Project would comprise a maximum of 994,982 square feet of floor area; when accounting for the existing Elysian apartment building to remain and the existing vacant buildings to be removed, the Project Site would include 1,105,318 square feet of floor area upon completion.

The Project's design would remain consistent with either scenario. Under either development scenario, the proposed uses would be built above a screened six-level parking podium, which would be partially below grade and partially above grade within four primary structures, including two residential towers (referred to as Tower A and Tower B), a hotel/residential tower (referred to as the Sunset Building), and a commercial building that could contain office, retail, restaurant, and parking uses (referred to as the Courtyard Building). Separate from the four primary structures, three low-rise, non-residential structures would be oriented towards Sunset Boulevard and Beaudry Avenue. A portion of the proposed residential uses would be provided in low-rise residential buildings dispersed throughout the eastern and southern portions of the Project Site around the base of the two residential towers. Office and commercial uses could be provided in the lower floors of these low-rise residential buildings. The Project would feature a landscaped central courtyard area called The Hill, which would provide 20,925 square feet of open space, passive recreation amenities, and long-distance views of the Downtown Los Angeles skyline and beyond.

1.2. SCOPE OF WORK

This report provides a description of the existing surface water hydrology, surface water quality, groundwater level, and groundwater quality at the Project Site. In addition, the report includes an analysis of the Project's potential impacts related to surface water hydrology, surface water quality, groundwater level, and groundwater quality.

2. REGULATORY FRAMEWORK

2.1. SURFACE WATER HYDROLOGY

County of Los Angeles Hydrology Manual

Per the City's Special Order No. 007-1299, December 3, 1999, the City has adopted the Los Angeles County Department of Public Works Hydrology Manual as its basis of design for storm drainage facilities. The Los Angeles County Department of Public Works' Hydrology Manual requires that a storm drain conveyance system be designed for a 25-year storm event and that the combined capacity of a storm drain and street flow system accommodate flow from a 50-year storm event. Areas with sump conditions are required to have a storm drain conveyance system capable of conveying flow from a 50-year storm event.[1] The County also limits the allowable discharge into existing storm drain facilities based on the municipal separate storm sewer system (MS4) Permit and is enforced on 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 requires the approval/review from the County Flood Control District department.

Los Angeles Municipal Code (LAMC)

Any proposed drainage improvements within the street right of way or any other property owned by, to be owned by, or under the control of the City requires the approval of a B-permit (Section 62.105, LAMC). Under the B-permit process, storm drain installation plans are subject to review and approval by the City of Los Angeles Department of Public Works Bureau of Engineering. Additionally, any connections to the City's storm drain system from a property line to a catch basin or a storm drain pipe requires a storm drain permit from the City of Los Angeles Department of Public Works, Bureau of Engineering.

2.2. SURFACE WATER QUALITY

Clean Water Act

The Clean Water Act was first introduced in 1948 as the Water Pollution Control Act. The Clean Water Act 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 Clean Water Act 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 Clean Water Act forms the basic national framework for the management of water quality and the control of pollutant discharges. The Clean Water Act 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,

[1] Los Angeles County Department of Public Works Hydrology Manual, January 2006, <http://ladpw.org/wrd/publication/index.cfm>..

shellfish and wildlife; developing waste treatment management plans; and developing and implementing programs for the control of non-point sources of pollution.[2]

Since its introduction, major amendments to the Clean Water Act have been enacted (e.g., 1961, 1966, 1970, 1972, 1977, and 1987). Amendments enacted in 1970 created the U.S. 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 Clean Water Act 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,[3] (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 EPA 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 Legislature in 1967. The joint authority of water distribution and water quality protection allows the Board 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.[4]

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[2] Non-point sources of pollution are carried through the environment via elements such as wind, rain, or stormwater and are generated by diffuse land use activities (such as runoff from streets and sidewalks or agricultural activities) rather than from an identifiable or discrete facility.

[3] A small municipal separate storm sewer system (MS4) is any MS4 not already covered by the Phase I program as a medium or large MS4. The Phase II Rule automatically covers on a nationwide basis all small MS4s located in "urbanized areas" as defined by the Bureau of the Census (unless waived by the NPDES permitting authority), and on a case-by-case basis those small MS4s located outside of urbanized areas that the NPDES permitting authority designates.

[4] USEPA. U.S. Environmental Protection Agency - Clean Water Act.

Federal Anti-Degradation Policy

The Federal Anti-degradation Policy (40 Code of Federal Regulations 131.12) requires states to develop statewide anti-degradation policies and identify methods for implementing them. Pursuant to the Code of Federal Regulations (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 Porter-Cologne Water Quality Control Act established the legal and regulatory framework for California's water quality control. The California Water Code authorizes the SWRCB to implement the provisions of the Clean Water Act, including the authority to regulate waste disposal and require cleanup of discharges of hazardous materials and other pollutants.

As discussed above, under the California Water Code (CWC), the State of California is divided into nine RWQCBs, governing the implementation and enforcement of the CWC and CWA. The Project Site 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. This Plan 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 Toxics Rule

In 2000, the EPA promulgated the California Toxics Rule, which establishes water quality criteria for certain toxic substances to be applied to waters in the State. The EPA promulgated this rule based on the EPA's determination that the numeric criteria are necessary in the State to protect human health and the environment. The California Toxics

< http://www.epa.gov/lawsregs/laws/cwa.html>..

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 Regional Water Quality Control Board (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, 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 antidegradation 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.[5]

The Basin Plan is a resource for the RWQCB 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 Clean Water Act 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.

Construction General Permit

SWRCB Order No. 2012-0006-DWQ known as "The Construction 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 Construction 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] Los Angeles Regional Water Quality Control Board. LARWQCB Basin Plan <http://www.waterboards.ca.gov/losangeles/water_issues/programs/basin_plan/>..

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

California mandates requirements for 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 Construction General Permit must prepare and implement a SWPPP that meets the requirements of the Construction General Permit.[6, 7]

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. This Order is the NPDES Permit or MS4 permit for municipal stormwater and urban runoff discharges within Los Angeles County. The requirements of this Order (the "Permit") cover 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 Los Angeles County MS4 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:

[6] State Water Resources Control Board. State Water Resources Control Board. August 2019. http://www.swrcb.ca.gov/water_issues/programs/npdes/.

[7] USEPA. U.S. Environmental Protection Agency - NPDES. < https://www.epa.gov/npdes>.

- 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 MS4 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 east 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 stormwater 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 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-Permittee:

   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 Budge Summary of expenditures for the stormwater 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-stormwater discharges to the storm drain system including discharge to the MS4 from various development types.

Standard Urban Stormwater Mitigation Plan (SUSMP)

Under the Los Angeles County Municipal NPDES Permit, permittees are required to implement a development planning program to address storm water pollution. These

programs require project applicants for certain types of projects to implement Standard Urban Stormwater Mitigation Plans (SUSMP) throughout the operational life of their projects. The purpose of SUSMP is to reduce the discharge of pollutants in storm water by outlining BMPs which must be incorporated into the design plans of new development and redevelopment. A project is subject to SUSMP if it falls under one of the categories listed below:

1. Single-family hillside homes.
2. Ten or more unit homes (including single family homes, multifamily homes, condominiums, and apartments).
3. Automotive service facilities.
4. Restaurants.
5. 100,000 or more square-feet of impervious surface in industrial/commercial development.
6. Retail gasoline outlet.
7. Parking lots with 5,000 square feet or more of surface area or with 25 or more parking spaces.
8. Redevelopment projects in subject categories that meet redevelopment thresholds.
9. Located within or directly adjacent to or discharging directly to an environmentally sensitive area if the discharge is likely to impact a sensitive biological species or habitat and the development creates 2,500 square feet or more of impervious surface.

City of Los Angeles Water Quality Compliance Master Plan for Urban Runoff

On March 2, 2007, City Council Motion 07-0663 was introduced by the City of Los Angeles City Council to develop a water quality master plan with strategic directions for planning, budgeting and funding to reduce pollution from urban runoff in the City of Los Angeles. The Water Quality Compliance Master Plan for Urban Runoff was developed by the Bureau of Sanitation, Watershed Protection Division in collaboration with stakeholders to address the requirements of this Council Motion. The primary goal of the Water Quality Compliance Master Plan for Urban Runoff is to help meet water quality regulations. Implementation of the Water Quality Compliance Master Plan for Urban Runoff is intended over the next 20 to 30 years 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 Water Quality Compliance Master Plan for Urban Runoff also supports the Mayor and Council's efforts to make Los Angeles the greenest major city in the nation.

- The Water Quality Compliance Master Plan for Urban Runoff 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 TMDL Implementation Plans and Watershed Management Plans. Additionally, the Water Quality Compliance Master Plan for Urban Runoff 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.

City of Los Angeles Stormwater Program

The City of Los Angeles supports the policies of the Construction General Permit and the Los Angeles County NPDES permit through the *Development Best Management Practices Handbook. Part A Construction Activities,* 3rd Edition, and associated ordinances were adopted in September 2004. *Part B Planning Activities*, 5th Edition was adopted in May 2016. The Handbook provides guidance for developers in complying with the requirements of the Development Planning Program regulations of the City's Stormwater Program. Compliance with the requirements of this manual is required by City of Los Angeles Ordinance No. 173,494. 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 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 Construction General Permit.

- The City of Los Angeles implements the requirement to incorporate stormwater BMPs through the City's plan review and approval process. During the review process, project plans are reviewed for compliance with the City's General Plan, zoning ordinances, and other applicable local ordinances and codes, including

storm water requirements. Plans and specifications are reviewed to ensure that the appropriate BMPs are incorporated to address storm water pollution prevention goals..

Los Angeles Municipal Code

Section 64.70 of the LAMC sets forth the City's Stormwater and Urban Runoff Pollution Control 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.

Low Impact Development – City of Los Angeles

In October 2011, the City of Los Angeles passed an ordinance (Ordinance No. 181,899) amending LAMC Chapter VI, Article 4.4, Sections 64.70.01 and 64.72 to expand the applicability of the existing Standard Urban Stormwater Mitigation Plan (SUSMP)

requirements by imposing rainwater Low Impact Development (LID) strategies on projects that require building permits. The LID ordinance became effective on May 12, 2012.

LID is a stormwater management strategy with goals to mitigate the impacts of increased runoff and stormwater pollution as close to its source as possible. LID promotes the use of natural infiltration systems, evapotranspiration, and the reuse of stormwater. The goal of these LID practices is to remove nutrients, bacteria, and metals from stormwater while also reducing the quantity and intensity of stormwater flows. Through the use of various infiltration strategies, LID is aimed at minimizing impervious surface area. Where infiltration is not feasible, the use of bioretention, rain gardens, green roofs, and rain barrels that will store, evaporate, detain, and/or treat runoff may be used.[8]

The intent of the City of Los Angeles LID standards is to:

- Require the use of LID practices in future developments and redevelopments to encourage the beneficial use of rainwater and urban runoff;
- Reduce stormwater/urban runoff while improving water quality;
- Promote rainwater harvesting;
- Reduce offsite runoff and provide increased groundwater recharge;
- Reduce erosion and hydrologic impacts downstream; and
- Enhance the recreational and aesthetic values in our communities.

The City of Los Angeles Bureau of Sanitation, Watershed Protection Division will adopt the LID standards as issued by the LARWQCB and the City of Los Angeles Department of Public Works. The LID Ordinance will conform to the regulations outlined in the NPDES Permit.

2.3. GROUNDWATER

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

As required by the CWC, the LARWQCB has 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 antidegradation policy, and describes implementation programs to protect all waters in the Los Angeles Region. In addition, the Basin Plan incorporates (by reference) all applicable

[8] City of Los Angeles. "Development Best Management Practices Handbook." May 2016.

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 Regional Board 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 federal Safe Drinking Water Act.

California Water Plan

The California Water Plan provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The California Water 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 California Water 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. ENVIRONMENTAL SETTING

3.1. SURFACE WATER HYDROLOGY

3.1.1. REGIONAL

As shown in Figure 8, the Project Site is located within the Los Angeles River Reach 2 Watershed in the Los Angeles Central Basin. Groundwater within Los Angeles County is stored in ground water basins underlying five major geographic areas. The Los Angeles River traverses over two of these geographic areas; San Fernando Valley and Coastal Plain. These areas contain three ground water Basins which underlay the river for its entire length; San Fernando Main Basin, Central Basin, and West Coast Basin. The largest basin is the San Fernando Main Basin. The Watershed encompasses a land area of approximately 834 square miles. The eastern portion spans from the Santa Monica Mountains to Simi Hills and in the west from the Santa Susana Mountains to the San Gabriel Mountains. The watershed is shaped by the path of the Los Angeles River, which flows from its headwaters in the mountains eastward toward the northern corner of Griffith Park. There the channel turns southward through Glendale Narrows before it flows across the coastal plan and into San Pedro near Long Beach. The Los Angeles River has evolved from an uncontrolled, meandering river providing a valuable source of water for early inhabitants to a major flood protection waterway. The City of Los Angeles River Watershed Section is tasked with finding ways to restore or revitalize the channels within the watershed and thereby provide significant opportunities for recreation and aesthetic improvement for the Los Angeles metropolitan area while protecting the Los Angeles Basin from major flooding. Refer to Figure 1 for Los Angeles River Watershed Map.

3.1.2. LOCAL

Underground storm drainage facilities along Sunset Boulevard are owned and maintained by Los Angeles County. Based on City of Los Angeles record data, there is an existing 48-inch Reinforced Concrete Pipe (RCP) on Sunset Boulevard. The Project Site contains approximately 72-percent impervious area with a 50-year storm flow rate of 18.11 cubic feet per second (cfs). See Figure 4 for calculation results. Stormwater runoff enters off-site catch basins and underground storm drainage pipes which convey stormwater through underground pipe networks into Los Angeles River. Los Angeles flows generally southerly, ultimately discharging into the Pacific Ocean at the San Pedro Harbor. The Los Angeles River is designed to discharge up to 183,000 cubic feet of stormwater per second from a 50-year frequency storm event.[9]

3.1.3. ON SITE

The existing Project Site is approximately 72-percent impervious as shown in Table 1 below. The Project Site is not crossed by any water courses or rivers. The Project Site is currently developed with four vacant, three-story structures that comprise 114,600 square feet and which were most recently used as church facilities. The Project Site also includes the Elysian apartment building which would remain. The Project Site also includes surface parking and circulation areas generally located on the eastern half of the Project Site. As shown in Figure 2, stormwater from the Project Site is conveyed by sheet flow in all directions, as the site sits on a hill. An analysis of existing contours has led the existing site drainage to be divided into five drainage areas as shown. Additionally, there are several curb drains around the Project Site. Flow is ultimately directed to the catch basins at the Sunset Boulevard and Beaudry Avenue intersection and the Beaudry Avenue and Bartlett

[9] http://www.ladwp.org/wmd/watershed/bc/..

Street intersection. The result of existing Q_{50} was presented in Table 1 below. The calculations are performed in HydroCalc in Figure 4.

Table 1- Existing Drainage Stormwater Runoff Calculations			
Drainage Area	Area (Acres)	Percent Impervious	Q50 (cfs) (volumetric flow rate measured in cubic feet per second)
Sub-Area 1	1.89	80	6.19
Sub-Area 2	1.42	75	4.65
Sub-Area 3	2.33	55	7.63
Sub-Area 4	.04	99	0.13
Sub-Area 5	0.59	99	1.93
Street [(a)]	0.92	100	2.29
Site Total	**6.27**	**72**	**22.82**
(a) Not part of Project Site therefore not summated into Site Total quantities for area and percent impervious			

3.2. SURFACE WATER QUALITY

3.2.1. REGIONAL

As stated above, the Project Site lies within the Los Angeles River Watershed Reach 2. Constituents of concern listed for Los Angeles River Watershed Reach 2 under California's Clean Water Act Section 303(d) List include Ammonia, Coliform Bacteria, Copper, Lead, Nutrients (Algae), Oil and Trash.[10] No TMDL data have been recorded by EPA for this waterbody.

3.2.2. LOCAL

In general, urban stormwater runoff occurs following precipitation events with the volume of runoff flowing into the drainage system depends on the intensity and duration of the rain event. Contaminants that may be found in stormwater from developed areas include sediments, trash, bacteria, metals, nutrients, organics and pesticides. The source of contaminants includes surface areas where precipitation falls, as well as the air it falls through. Contaminants on surfaces such as roads, maintenance areas, parking lots, and buildings, which are usually contained in dry weather conditions, may be carried by rainfall

[10] CA Water board: 2010 CALIFORNIA 303(d) LIST OF WATER QUALITY LIMITED SEGMENTS. available at https://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/category5_report.shtml .

runoff into drainage systems. The City has installed catch basins with screens to capture debris before entering the storm drain system. In addition, the City conducts routine street cleaning operations as well as periodic cleaning and maintenance of catch basins to reduce stormwater pollution within the City.

3.2.3. ON SITE

While the Project Site currently does not have structural BMPs for the treatment of stormwater runoff from existing impervious surfaces such as building roof areas and pavements, there are a range of non-structural BMPs and environmental water quality measures that are currently utilized at the Project Site to minimize the impact of pollutant sources. These include general housekeeping practices such as regular trash collection, spill prevention and response activities where applicable; proper storage of hazardous materials and wastes; and substituting environmentally friendly products for environmentally hazardous products, such as soaps, solvents, and pesticides. In addition, stormwater runoff from the minimal existing pervious surfaces such as the landscaped areas and lawns is naturally treated to some extent by existing vegetation and the absorptive properties of the existing soils. Based on the existing operations within the Project Site, the on-site runoff likely contains the following pollutants of concern: sediment, nutrients, pesticides, metals, pathogens, and oil and grease.

3.3. GROUNDWATER HYDROLOGY

3.3.1. REGIONAL

Groundwater use for domestic water supply is a major beneficial use of groundwater basins in Los Angeles County. The City of Los Angeles overlies the Los Angeles Coastal Plain Groundwater Basin (Basin). The Basin is comprised of the Hollywood, Santa Monica, Central, and West Coast Groundwater Subbasins. Groundwater flow in the Basin is generally south-southwesterly and may be restricted by natural geological features. Replenishment of groundwater basins occurs mainly by percolation of precipitation throughout the region via permeable surfaces, spreading grounds, and groundwater migration from adjacent basins, as well as injection wells designed to pump freshwater along specific seawater barriers to prevent the intrusion of salt water. Refer to Figure 5 for the groundwater basin exhibit.

3.3.2. LOCAL

The Project is located in the Elysian Hills which is north of the Los Angeles Coastal Plain Groundwater Basin. Within the Los Angeles Coastal Plain Groundwater Basin, the Project Site specifically contributes to the Central Subbasin. The Project Site is located east of the Central Subbasin, is bounded on the north by the Santa Monica Mountains and the Hollywood fault, on the west by the Inglewood fault zone, and on the south by the La Brea high, formed by an anticline that brings impermeable rocks closer to the surface.[11]

[11] California Groundwater Bulletin 118: Coastal Plain of Los Angeles Groundwater Basin, Central Subbasin. <http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/4-11.02.pdf> .

Groundwater in the Subbasin is replenished by percolation of precipitation and stream flow from the Santa Monica Mountains to the north. Urbanization in this area has decreased the amount of pervious surface area allowing direct percolation. Therefore, natural recharge is somewhat limited. The natural safe yield of the Subbasin is estimated to be approximately 3,000 acre-feet per year (AFY).

3.3.3. ON-SITE

As previously discussed, the Project Site contributes to the Central Subbasin of the Coastal Plain of the Los Angeles Groundwater Basin. The Project Site slopes generally in a 10:1 (Horizontal: Vertical) gradient with a total elevation difference of 51 feet. The current ground surface is range from 381 feet above mean sea level on the southwestern corner of the Project Site to approximately 432 feet along White Knoll Drive. Locally steep grades occur and the Project Site will have several patio and garden terraces to connect the elevation differences. Near the proposed central landscape feature identified as the "Hill" in the center of the Project Site the ground surface elevation is approximately 442 feet.

As discussed by the Project Geotechnical Engineer, Geotechnologies, "The highest elevation of encountered seepage is 393.5 feet above mean sea level corresponding to a depth of 29 feet in Boring 1. The shallowest depth where seepage was encountered was in Boring 4 at a depth of 16 feet, corresponding to elevation 384.5 feet. Since the site elevations range from 432 to 381 feet, a singular ground water elevation is not realistic across the site. It is the recommendation of this firm (Geotechnologies) that a recommended depth below the ground surface is appropriate for design. The historically highest groundwater level is indicated to be 20 feet below the ground surface according to the Seismic Hazards Zone Report (CDMG, 2006). This depth to groundwater is appropriate for design across the site. " [12]

3.4. GROUNDWATER QUALITY

3.4.1. REGIONAL

As stated above, the City of Los Angeles overlies the Los Angeles Coastal Plain Groundwater Basin. This basin falls under the jurisdiction of the LARWQCB. According to LARWQCB's Basin Plan, objectives applying to all ground waters of the Region include Bacteria, Chemical Constituents and Radioactivity, Mineral Quality, Nitrogen (Nitrate, Nitrite), and Taste and Odor.[13]

[12] GEOTECHNOLOGIES, INC. Updated Geotechnical Engineering Investigation for Proposed Mixed-Use Development 1111 Sunset Boulevard, Los Angeles, California, dated on October 10, 2017 and updated on February 19, 2021.

[13] Los Angeles Regional Water Quality Control Board, Basin Plan, March 2013, http://www.waterboards.ca.gov/losangeles/water_issues/programs/basin_plan/electronics_documents/Final%20Chapter%203%20Text.pdf .

3.4.2. LOCAL

As stated above, the Project Site contributes to the Central Subbasin. Based upon LARWQCB's Basin Plan, constituents of concern listed for the Central Subbasin include boron, chloride, sulfate, and Total Dissolved Solids (TDS).

3.4.3. ON-SITE

Though it is possible for surface water borne contaminants to percolate into groundwater and affect groundwater quality, as the Project Site is 72-percent impervious in the existing condition, no appreciable infiltration of potential contaminants described above is expected to occur. As the existing buildings are currently vacant, groundwater quality is not impacted by existing activities at the Project Site.

Other types of risk such as underground storage tanks (USTs) have a greater potential to impact groundwater. According to the Phase 1 Environmental Assessment by Geosyntec Consultants[14], "There is no evidence of existing USTs or ASTs was observed on the Project Site, SCAQMD and Los Angeles Fire Department records indicate the permitting and installation of a 500-gallon diesel-fuel UST associated with the Project Site's former use as the MWD headquarters. Based on SCAQMD and Los Angeles Fire Department records, the UST appears to be located near the northern perimeter of the Project Site, as part of the Elysian apartment building. Records also indicate that a 500-gallon UST is used by the Elysian apartment building for a backup generator. The Project would not involve any construction in or near the area of the existing UST. No other records were found that indicate the presence of USTs within the areas proposed for construction. Notwithstanding, in the unlikely event that USTs are found, suspect materials would be removed in accordance with all applicable federal, state, and local regulations. For example, if underground storage tanks are encountered, prior to removal, applicable permits would be obtained from the LAFD." Therefore, USTs from the Project Site would not propose a significant impact on groundwater quality.

Furthermore, there are also risks associated with oil wells impacting groundwater quality. As mentioned in the Phase 1 Environmental Assessment by Geosyntec Consultants[16]. The current and past land uses within the Project Site were identified to assess their potential to present concerns relative to the presence of hazards and/or the handling of hazardous materials. These concerns are classified as Recognized Environmental Conditions (RECs), which are defined as "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, past release, or material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water or surface water of the property."

[14]GEOSYNTEC CONSULTANTS. Phase 1 Environmental Site Assessment 1111 Sunset Boulevard, Los Angeles, California, March 2018.

The Project Site is currently developed with four vacant structures generally located in the center and along the western area of the Project Site; the Elysian apartment building, which provides 96 joint live-work units, includes a ground floor restaurant, generally located along the northern portion of the Project Site and surface parking and circulation areas; and is located on the eastern half of the Project Site. The Project Site was previously constructed and occupied by the Metropolitan Water District of Southern California (MWD) and most recently adapted for use by the Holy Hill Community Church.

As described in detail in the Cultural and Paleontological Resource Assessment (dated February 2021), historical maps of the Project Site indicate the Project Site was initially developed as a park (named Beaudry Park) in 1873. In 1881, Beaudry Park at the Project Site was advertised for sale and was acquired by the Sisters of Charity, who built a hospital at the Project Site. During the time the Sisters of Charity occupied the Project Site, an oil discovery in 1892 led to an oil drilling boom in certain areas of the City and the Los Angeles City Oil Field was defined. The Los Angeles City Oil Field ran in a roughly westerly direction from Elysian Park for a distance of approximately 4.5 miles. The Project Site is located within the East Field portion of the Los Angeles City Oil Field, with the Project Site specifically marking the western extent of the East Field. Based on the Cultural and Paleontological Resource Assessment, oil wells in the East Field produced satisfactorily at the start but waned quickly, operating only between two and 13 years. Oil drilling on a portion of the Project Site continued through the early 1900s under a 10-year lease that gave the Sisters of Charity rights to oil on their property.

In November 1927, the Sisters of Charity moved their hospital to a new facility. The hospital at the Project Site remained vacant and the hospital was demolished between 1932 and 1934. The nurses' residences constructed in 1914, a shrine, and stairs remained on the Project Site until the Project Site was redeveloped by the Metropolitan Water District of Southern California (MWD) in 1959. MWD began construction of the MWD Sunset Boulevard Headquarters Campus on the Project Site in 1961 and completed construction of the buildings in 1963. An additional office tower annex (also known as the existing Elysian apartment building) was later built in 1973. The Elysian apartment building is not part of the Project. MWD moved from the Project Site in 1993. The Holy Hill Community Church purchased the property in 1994 and constructed an additional building in 1998. The Holy Hill Community Church vacated the Project Site in 2014. As previously noted, the church buildings are currently vacant.

Based on a review of the historical documents and in general accordance with CalGEM's records, there is a reasonable basis to assume the presence of six oil wells, as indicated on the CalGEM online database and as listed on the Updated Oil Wells Investigation Report by Geosyntec Consultants dated on December 17, 2020 and updated on February 4, 2021, along the southern and eastern Site boundary. Existing roads along the southern and eastern Site perimeter appear to have been altered (i.e., widened), likely resulting in oil well locations that are now within the wider street right of way than was present in the early 1900s. Although a few of the historical maps could be interpreted to suggest additional oil wells at or near the site, given the absence of any corroborating evidence at this time, despite fairly extensive historical research, it is possible that the potential

additional locations shown on a few historical maps are actually the same six oil wells identified in CalGEM's database.

The oil wells are listed as "buried/idle"[15] in the database maintained by CalGEM. In addition, based on various correspondence with CalGEM, the buried oil wells are likely not to have been abandoned in accordance with current CalGEM standards. Furthermore, a subsurface investigation in the southern portion of the Project Site conducted in 2015[16] identified petroleum hydrocarbons and methane concentrations in soil at the Project Site. As described above, the Project Site is located within the Los Angeles City Oil Field, which is known to have concentrations of methane and hydrogen sulfide. In addition, the Project Site is located within the City of Los Angeles Methane Zone. Based on the previous use of the Project Site, the location of the Project Site within an oil field and methane zone, the likely presence of buried oil wells and identified concentrations of petroleum hydrocarbons and methane in soil at the Project Site, these conditions can be identified to be RECs as described in the Phase I ESA and the Methane Report by Geosyntec Consultants dated on February 2018 and updated on Feb 4, 2021.

In the event contaminated soils are encountered during construction, or construction occurs in areas of known or potential contamination, the nature and extent of the contamination would be determined and appropriate handling, disposal, and/or treatment would be implemented in accordance with applicable regulatory requirements, including SCAQMD Rule 1166[17], and in accordance with the Project Mitigation Measures. With the implementation of these recommendations, the existing oil wells from the Project Site would not propose a significant impact on groundwater quality.

4. SIGNIFICANCE THRESHOLDS

In accordance with the significance thresholds described by the California Environmental Quality Act (CEQA), the Project has been analyzed for potential impacts on hydrology, water quality, and groundwater. This report includes an analysis of the Project with respect to the CEQA Appendix G thresholds as described below.

4.1. SURFACE WATER HYDROLOGY

Appendix G of the 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, in a manner which would:

[15] CalGEM defines idle wells as wells that have been inactive for a period of 24 consecutive months while buried wells are typically older and are not abandoned to current standards.

[16] ADR Environmental Group, Inc., Subsurface Investigation Report, May 7, 2015.

[17] South Coast Air Quality Management District. Rules and Compliance, Rule 1166, http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1166.pdf?sfvrsn=4,.

- Result in 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 storm water drainage systems, or provide substantial additional sources of polluted runoff; or
- Impede or redirect flood flows;

- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.

In the context of the above questions from the Appendix G of the CEQA Guidelines, the City of Los Angeles considers factors from the *L.A. CEQA Thresholds Guide*, which 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 water quality; or
- Conflict with or obstruct implementation of a water quality control plan.

In the context of the above questions from Appendix G, the City of Los Angeles considers factors from the *L.A. CEQA Thresholds Guide*, which 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 California Water Code (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.[18]

4.3. GROUNDWATER HYDROLOGY

Appendix G of the CEQA Guidelines provides sample questions that address impacts with regard to groundwater. These questions are as follows:

Would the project:

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

- Conflict with or obstruct implementation of a sustainable groundwater management plan.

In the context of the above questions from the Appendix G of the CEQA Guidelines, the City of Los Angeles considers factors from the *L.A. CEQA Thresholds Guide*, which states that a project would normally have a significant impact on groundwater hydrology 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

[18] City of Los Angeles.LA. CEQA Thresholds Guide. 2006 http://www.environmentla.org/programs/Thresholds/Complete%20Threshold%20Guide%202006.pdf. Accessed February 7, 2021.

- 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

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

Would the project:

- Violate any water quality standard or waste discharge requirements or otherwise substantially degrade ground water quality; or
- Conflict with or obstruct implementation of a water quality control plan.

In the context of the above questions from the Appendix G of the CEQA Guidelines, the City of Los Angeles considers factors from the *L.A. CEQA Thresholds Guide*, which states that a project would normally have a significant impact on groundwater hydrology 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 California Code of Regulations (CCR), Title 22, Division 4, and Chapter 15 and in the Safe Drinking Water Act.

5. METHODOLOGY

5.1. SURFACE WATER HYDROLOGY

The Project Site is located within the City of Los Angeles, and drainage collection, treatment and conveyance are regulated by the City. Per the City's Special Order No. 007-1299, December 3, 1999, the City 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 criteria 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.

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.

The LACDPW 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 Figure 4 for the Hydrocalc Calculator results and Figure 7 for Isohyet Map.

5.2. SURFACE WATER QUALITY

5.2.1. CONSTRUCTION

The methodology to determine impacts related to construction regarding surface water quality is largely based upon determination of construction BMPs. Construction BMPs will be designed and maintained as part of the implementation of the SWPPP in compliance with the Construction 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 Notice of Intent (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 Construction General Permit. In addition, as part of the NOI application a risk level evaluation will be performed to determine the risk level category (risk level 1, 2, or 3) for the Project based on a detailed construction schedule, soil type, site slope, and

location. Each of the three risk level categories establishes specific monitoring and testing requirements.

5.2.2. OPERATION

The Project will meet the requirements of the City's LID standards.[19] 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. Specifically, LID guidelines require that infiltration systems maintain at least 10 feet of clearance to the groundwater, property line, and any building structure.

The historic high groundwater level is at least 20 feet below the ground surface. According to the Geotechnical investigation prepared for the Project Site[20], it has discussed that infiltration may not be considered feasible due to potential adverse impacts to the performance of the planned improvements.

A stormwater capture system will likely be required and sized per LID guidelines. However, if capture and use is later determined to not be feasible, the Project would then be required to implement High Efficiency Biofiltration/Bioretention Systems. See Figure 6 for LID calculations.

According to the City's LID Handbook, all cisterns shall be sized to capture the runoff generated from the greater of the 85th percentile storm and the 0.75-inch storm event at a minimum:

Vdesign (gallons) = (85th percentile or 0.75 inch * 7.48 gallons/cubic foot) * Catchment Area (sq. ft.)

Where:

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[19] Development Best Management Practices Handbook, Part B Planning Activities, 5th edition was adopted by the City of Los Angeles, Board of Public Works on May 9, 2016 to reflect Low Impact Development (LID) requirements that took effect May 12, 2012.

[20] GEOTECHNOLOGIES, INC. Updated Geotechnical Engineering Investigation for Proposed Mixed-Use Development 1111 Sunset Boulevard, Los Angeles, California, dated on October 10, 2017 and updated on February 19, 2021.

Catchment Area = (Impervious Area x 0.9) + [(Pervious Area + Undeveloped Area) x 0.1]

For catchment areas given in acres, multiply the above equation by 43,560 sq. ft./acre.

5.3. GROUNDWATER

To determine the level of significant impact of this Project, under the above threshold and as it relates to the level of the underlying groundwater table of the Central Subbasin Groundwater Basin, the analysis included a review of the following considerations:

Analysis and Description of the Project's Existing Condition

- Identification of the Central Subbasin 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);
- Area and degree of permeability of soils on the Project Site;

Analysis of the Proposed 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 Project Site on the groundwater quality of the underlying Central Subbasin.

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

6. PROJECT IMPACT ANALYSIS

6.1. CONSTRUCTION

6.1.1. SURFACE WATER HYDROLOGY

Construction activities for the Project would include excavating down approximately 64 feet for the six-level subterranean parking garage in approximately the lowest proposed bottom of excavation surfaces from the approximate highest current ground surfaces. Throughout the Project Site the elevation difference is 51 feet with an overall gradient of 10 to 1. It is anticipated that grading activities of approximately 471,939 net cubic yards of soil with a 20% swell contingency and 10% design contingency. Construction activities would have the potential to temporarily alter existing drainage patterns and flows within the Project Site by exposing the underlying soils and making the Project Site temporarily more permeable. Exposed and stockpiled soils could be subject to erosion and conveyance into nearby storm drains during storm events. In addition, construction activities such as earth moving, maintenance/operation of construction equipment, and handling/storage/disposal of materials could contribute to pollutant loading in stormwater runoff.

However, as the construction site would be greater than one acre, the Project would be required to obtain coverage under the NPDES General Construction 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 in fact) contain and treat, as necessary, stormwater or construction watering on the Project Site 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 General Construction Permit requirements, implementation of BMPs, and compliance with applicable City grading regulations, the Project would not substantially alter the Project Site 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, 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/operation of construction equipment, expected dewatering, and handling/storage/disposal of materials could contribute to pollutant loading in stormwater runoff. However, as previously discussed, construction contractors disturbing greater than one acre of soil would be required to obtain coverage under the NPDES General Construction Permit (order No. 2012-0006-DWQ). In accordance with the requirements of the permit, the Project 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 Exhibit 1 for typical SWPPP BMPs to be implemented during construction of the Project.

As discussed below, the Project may require dewatering during construction. Dewatering operations are practices that discharge non-stormwater, such as groundwater, that must be removed from a work location to proceed with construction into the drainage system. Discharges from dewatering operations can contain high levels of fine sediments, which if not properly treated, could lead to exceedance of the NPDES requirements. During construction, temporary dewatering systems such as dewatering tanks, sand media particulate, pressurized bag filters, and cartridge filters would be utilized in compliance with the NPDES permit. These temporary systems, which are further described below, would comply with all relevant NPDES requirements related to construction and discharges from dewatering operations.

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 Project 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 construction-related impacts on surface water quality would be less than significant.

6.1.3. GROUNDWATER HYDROLOGY

As stated above, construction activities for the Project would include excavating down approximately 64 feet for the six-level subterranean parking garage in the approximate lowest proposed bottom of excavation surfaces from the approximate highest current ground surfaces. The historically highest groundwater level is on the order of 20 feet below grade as stated in the Updated Geotechnical Report for 1111 Sunset Boulevard, Los Angeles, California, October 10, 2017 and updated on February 19, 2021.

Therefore, it is recommended that a qualified dewatering consultant should be retained to establish a temporary dewatering plan during construction. Dewatering operations are expected and appropriate compliance and containment measures would be implemented to avoid impacts associated with potential groundwater discharges. As stated above, possible dewatering systems to be used as listed in the California Stormwater Quality Association (CASQA) BMP Handbook are as follows:

- Dewatering Tanks:

A dewatering tank removes debris and sediment. Flow enters the tank through the top, passes through a fabric filter, and is discharged through the bottom of the tank. The filter separates the solids from the liquids.

- Sand Media Particulate Filters:
  Water is treated by passing it through canisters filled with sand media. Generally, sand filters provide a final level of treatment. They are of then used as secondary or higher level of treatment after a significant amount of sediment and other pollutants have been removed using other methods.

- Pressurized Bag Filters:
  A pressurized bag filter is a unit composed of single filter bags made from polyester felt material. The water filters through the unit and is discharged through a header. Vendors provide bag filters in a variety of configurations. Some units include a combination of bag filters for enhanced contaminant removal.

- Cartridge Filters:
  Cartridge filters provide a high degree of pollutant removal by utilizing a number of individual cartridges as part of a larger filtering unit. Similar to sand media particulate filters, they are often used as a secondary level of treatment after a significant amount of sediment and other pollutants are removed. Units come with various cartridge configurations (for use in series with bag filters) or with a larger single cartridge filtration unit (with multiple filters within).

Due to the operation of temporary dewatering systems local groundwater hydrology in the immediate vicinity of the Site 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

As discussed above, the Project would include excavations to a depth of approximately 64 feet below ground surface. The Project would also result in a net export of existing soil material. As discussed in section 3.4.3, any contaminated soils found would be captured within that volume of excavated material, removed from the Project Site, and remediated at an approved disposal facility in accordance with regulatory requirements. There are no USTs within the Project Site, therefore it will not create a significant adverse effect on groundwater quality. See section 3.4.3 for further discussion regarding USTs and oil wells onsite.

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 measures as listed above and the implementation of BMPs, as there are no groundwater production wells or public water supply wells within one mile of the Project Site, construction activities would not be anticipated to affect existing wells. Therefore, the Project would not result in any substantial increase in groundwater contamination through hazardous materials releases during construction and impacts on groundwater quality would be less than significant.

Due to existing geologic conditions described above, oil wells may be encountered on the Project. As such, it is expected that the water encountered in the vicinity of the oil wells would be petroleum-impacted. However, the Project is not expected to alter these existing conditions.

Further, the following mitigation measures will be implemented during construction:

- In accordance with Mitigation Measure HAZ-MM-1, the Project will ensure that all wells on the Project Site shall be abandoned and all construction in and around an abandoned well are consistent with current CalGEM regulations and recommendations (meeting the standards at the time of condition clearance).

- In accordance with Mitigation Measure HAZ-MM-2, if any on-site oil wells are located, the licensed Petroleum Engineer (hired under HAZ-MM-1) shall survey and leak test all oil wells and shall equip the wells in general accordance with relevant CalGEM and City of Los Angeles Petroleum Administrator and/or his/her designee requirements as specified in the Draft EIR.

- In accordance with Mitigation Measure HAZ-MM-3, a soil and site management plan will be developed and implemented to ensure all on-site contaminated soil is properly disposed of at an appropriate, permitted disposal or treatment facility and to address the potential identification and abandonment of oil wells if encountered during earthwork activities.

- In accordance with Mitigation Measure HAZ-MM-4, during construction activities at the Project Site, controls shall be in place to mitigate the effects of subsurface gases and impacted soil and groundwater on workers and the public.

Further details of the above Mitigation measures are available in the Draft EIR.

Based on the above, operation of the Project would result in a less than significant impact on groundwater quality.

6.2. OPERATION

6.2.1. SURFACE WATER HYDROLOGY

The proposed Project Site is approximately 87-percent impervious. Approximately 13-percent of the existing Project Site is pervious surfaces consisting of landscape areas and planters. The Project would include development of new buildings, paved areas, and landscaped areas. As shown in Figure 3, stormwater from the Project Site is conveyed by sheet flow in all directions, as the site sits on a hill.

Table 2 below shows the proposed peak flow rates stormwater runoff calculations for the 50-year frequency design storm event. Table 3 compares the results in Table 2 to the existing conditions shown in Table 1.

Table 2- Proposed Drainage Stormwater Runoff Calculations

Drainage Area	Area (Acres)	Percent Impervious	Q50 (cfs) (volumetric flow rate measured in cubic feet per second)
Sub-Area 1	1.53	90	5.01
Sub-Area 2	1.39	90	4.55
Sub-Area 3	2.72	80	8.91
Sub-Area 4	0.04	99	0.13
Sub-Area 5	0.59	99	1.93
Street[(a)]	0.92	100	2.29
Site Total	**6.27**	**87**	**22.82**

(a) Not part of Project Site therefore not summated into Site Total quantities for area and percent impervious.

Table 3- Existing and Proposed Conditions Comparison					
Drainage Area	Area (Acres)		Q50 (cfs) (volumetric flow rate measured in cubic feet per second)		
	Existing	Proposed	Existing	Proposed	Delta
Sub-Area 1	1.89	1.53	6.19	5.01	-1.18
Sub-Area 2	1.42	1.39	4.65	4.55	-0.10
Sub-Area 3	2.33	2.72	7.63	8.91	+1.28
Sub-Area 4	0.04	0.04	0.13	0.13	0.00
Sub-Area 5	0.59	0.59	1.93	1.93	0.00
Street[(a)]	0.92	0.92	2.29	2.29	0.00
Site Total	**6.27**	**6.27**	**22.82**	**22.82**	**0**
(a) Not part of Project Site therefore not summated into Site Total quantities for area.					

Therefore, the Project is not expected to cause flooding during a 50-year storm event or result in an adverse change to the movement of surface water.

The LID requirements for the Project Site would outline the stormwater treatment post-construction BMPs required to control pollutants associated with storm events up to the 85th percentile storm event. The Project BMPs will mitigate the stormwater runoff quality and quantity.

As shown on Table 3, the only net increase of flow came from Sub-Area 3. Further analysis of the street flow contribution in which Sub-Area 3 flows to is shown in Figure 2. The sheet flow from Sub-Area 3 and the street are directed to a set of three catch basins on Sunset Boulevard. As-built maps reveal that there are 3 storm drain lines associated with the catch basin on Sunset Boulevard. Two of the three storm catch basins are owned by the County of Los Angeles, and one storm catch basin is owned by the City of Los Angeles. All three catch basin laterals are owned/maintained by LACFCD. Based on Table 3, there is an anticipated increase of 1.28 cfs from Sub-Area 3. In compliance with County of LA methodology, the Project will coordinate with the LACFCD to determine the allowable flow, Qallowable, to the aforementioned storm drain laterals. Qallowable is determined by LACFCD to be the acceptable upper limit of storm water flow at which their system will provide adequate flood mitigation and control. Compliance with any storm flow in excess of this Qallowable will be required to be detained on site per County standards. By complying with the Qallowable, the Project would not cause flooding during the 50-year developed storm event, would not create runoff which would exceed the capacity of existing or planned drainage systems, would not require construction of new stormwater drainage facilities or expansion of existing facilities, would not 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. Therefore, potential operational impacts to site surface water hydrology would be less than significant.

The nearest levee is along the Los Angeles River located approximately 300 feet east of the Project Site. The US Army Corps of Engineers operates and maintains the 22.5 mile stretch of the Los Angeles River between Lankershim Boulevard in Hollywood and Stuart and Grey Road in Downey, which is the portion adjacent to the Project Site. Their maintenance activities include inspection and cleaning of the channel walls and removing vegetation growing in cracks and joints. In 2017 they awarded a contract for the repair of a damage embankment in Reach 4D of the Los Angeles River Flood Control Channel. Previously, HESCO barriers were installed in parts of the Channel identified as at greatest risk of flood waters during the 2015/2016 El Nino storm season. Given that the Army Corps of Engineers is taking an active role in identifying areas in need of repair and flood mitigation and that the area adjacent to the Project Site has not been identified in need of improvement, as well as the fact that active improvements are taking place upstream of the Project Site, the risk to the proposed development due to dam or levee failure is less than significant[21].

6.2.2. SURFACE WATER QUALITY

Under section 3.1.3. of the LID Manual, post-construction stormwater runoff from new projects must be infiltrated, evapotranspirated, captured and used, and/or treated through high efficiency BMPs onsite for the volume of water produced by the 85th percentile storm event. Consistent with LID requirements to reduce the quantity and improve the quality of rainfall runoff that leaves the Project Site, the Project would include the installation of Capture and Use or Biofiltration Planter BMPs as established by the LID Manual. The installed BMP systems will be designed with an internal bypass overflow system to prevent upstream flooding during major storm events. As the majority of potential contaminants are anticipated to be contained within the "first flush" 85th percentile storm event, major storms are not anticipated to cause an exceedance of regulatory standards.

As is typical of most urban developments, stormwater runoff from the Project Site has the potential to introduce pollutants into the stormwater system. Anticipated and potential pollutants generated by the Project include sediment, nutrients, pesticides, metals, pathogens, and oil and grease.

The pollutants listed above are expected to, and would in fact, be mitigated through the implementation of approved LID BMPs. In addition, the implementation of the following LID BMPs would be included in Project design to manage post-construction stormwater runoff:

- Provide storm drain system stenciling and signage to discourage illegal dumping;
- Design material storage areas and loading docks within structures or enclosures to prevent leaks or spills of pollutants from entering the storm drain system and;

[21] US Army Corps of Engineers, http://www.spl.usace.army.mil/Missions/Asset-Management/Los-Angeles-River/ .

- Provide evidence of ongoing BMP maintenance as part of a legal agreement with the City of Los Angeles. Recorded covenant and agreements for BMP maintenance are part of standard building permit approval processing.

Based on the above, with implementation of BMPs such as those described above, 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. Furthermore, operation of the Project would not result in discharges that would cause regulatory standards to be violated in the Los Angeles River Watershed Reach 2. Thus, operational impacts on surface water quality would be less than significant.

6.2.3. GROUNDWATER LEVEL

The Project will develop hardscape and structures that cover the majority (87-percent) of the Project footprint with impervious surfaces. However, the Project would include the installation of SUSMP and LID BMPs, which would mitigate at minimum the first flush or the equivalent of the greater between the 85th percentile storm and first 0.75-inch of rainfall for any storm event. The installed BMP systems will be designed with an internal bypass or overflow system to prevent upstream flooding due to large storm events. The stormwater which bypasses the BMP systems would discharge to an approved discharge point in the public right-of-way and not result in infiltration of a large amount of rainfall, which would affect groundwater hydrology, including the direction of groundwater flow.

As described in the Updated Geotechnical Engineering Investigation prepared for the Project Site, the historic high groundwater level in the vicinity of the Project site was on the order of 20 feet below grade. Where the proposed structure has a finish floor elevation 20 feet or more below the existing ground surface, the proposed structure should utilize a hydrostatic design. The hydrostatic design shall withstand hydrostatic forces and incorporate comprehensive waterproofing systems in accordance with current industry standards and construction methods. As such, permanent dewatering operations are not expected and the groundwater level is expected to return to the existing level at the Project after construction is complete. Based on the above, operation of the Project would result in a less than significant impact on groundwater hydrology, including groundwater levels.

6.2.4. GROUNDWATER QUALITY

Operational activities which could affect groundwater quality include spills of hazardous materials and leaking underground storage tanks. Surface spills from the handling of hazardous materials most often involve small quantities and are cleaned up in a timely manner, thereby resulting in little threat to groundwater. Other types of risks such as leaking underground storage tanks have a greater potential to affect groundwater. As

mentioned in section 3.4.3, no USTs are in the Project Site areas intended for construction. There is a record of an UST associated with what is now the unrelated Elysian apartment building, which sits on the Project Site, but with no construction planned to take place near this UST. Furthermore, there will be no proposed USTs that will be operated associated with the Project. While the development of the new Project would comply with all applicable existing regulations at the Project Site, prevention methods will be enforced so the Project will not affect or expand any potential areas of contamination, increase the level of contamination, or cause regulatory water quality standards at an existing production well to be violated, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act. Furthermore, as described above, operation of the Project would not require extraction from the groundwater supply based on the depth of excavation for the proposed uses and the depth of groundwater below the Project Site. Additionally, the Project would include the installation of SUSMP and LID BMPs, which would mitigate at minimum the first flush or the equivalent of the greater between the 85th percentile storm and first 0.75-inch of rainfall for any storm event.

As described in section 3.4 above, the Project Site was previously operated as an oil field and as such has a greater potential for methane and hydrocarbons in the soils and groundwater. Additionally, there are potentially six on-site oil wells, as documented by CalGEM's maps. The Project does not include the installation of new oil wells, and Project design would not impede access to abandoned oil wells on the Project Site should the need for future abandonment arise during Project Operations. Additionally, the Project will not implement infiltration as a means of satisfying City of LA LID BMP requirements due to shallow groundwater and potential contamination concerns. Therefore, the Project will not affect the rate or change the direction of movement of existing contaminants, would not expand the area affected by contaminants, would not 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 California Code of Regulations (CCR), Title 22, Division 4, and Chapter 15 and in the Safe Drinking Water Act.

Furthermore, the following mitigation measures will be implemented during Project operation:

- In accordance with Mitigation Measure HAZ-MM-1, the Project will ensure that all wells on the Project Site shall be abandoned and all construction in and around an abandoned well are consistent with current CalGEM regulations and recommendations (meeting the standards at the time of condition clearance).

- In accordance with Mitigation Measure HAZ-MM-2, if any on-site oil wells are located, the licensed Petroleum Engineer (hired under HAZ-MM-1) shall survey and leak test all oil wells and shall equip the wells in general accordance with relevant CalGEM and City of Los Angeles Petroleum Administrator and/or his/her designee requirements as specified in the Draft EIR.

- In accordance with Mitigation Measure HAZ-MM-5, the Applicant shall install a Passive System regardless of the design methane concentration or the design methane pressures.

Further details of the above Mitigation measures are available in the Draft EIR.

Based on the above, operation of the Project would result in a less than significant impact on groundwater quality.

6.3. CUMULATIVE IMPACT ANALYSIS

6.3.1. SURFACE WATER HYDROLOGY

The geographic context for the cumulative impact analysis on surface water hydrology is the Los Angeles River Watershed. In accordance with City requirements, the Project and related projects would be required to implement BMPs to manage stormwater runoff in accordance with LID guidelines. Furthermore, the City of Los Angeles Department of Public Works reviews projects on a case-by-case basis to ensure sufficient local and regional infrastructure is available to accommodate stormwater runoff. Therefore, potential cumulative impacts associated with the Project on surface water hydrology would not be cumulatively considerable and less than significant.

6.3.2. SURFACE WATER QUALITY

Future growth, including the related projects, in the Los Angeles River Watershed would be subject to NPDES requirements relating to water quality for both construction and operation. The Project Site is located in a highly urbanized area and it is anticipated that future development projects would also be subject to LID requirements. The Project would comply with all applicable laws, rules and regulations, so Project cumulative impacts to surface water quality would be less than significant.

6.3.3. GROUNDWATER HYDROLOGY

Cumulative groundwater hydrology impacts could result from the overall utilization of groundwater basins located in proximity to the Project and the related projects. In addition, interruptions to existing hydrology flow by dewatering operations of underground water would have the potential to affect groundwater levels. The purpose of dewatering operations is for the protection of both existing and proposed building structures. The dewatering system expected for construction of the Project would be temporary, would not operate at all times, and would only be activated when the level of the water reaches the permitted level that initiates the dewatering operations. While short-term, periodic dewatering has the potential to have a minimal effect on groundwater hydrology locally at the Project, dewatering operations at such a temporary, localized level would not have the potential to affect regional groundwater hydrology.

Similar to the Project, other proposed projects within the groundwater basin will likely incorporate structural designs for subterranean levels that are able to withstand hydrostatic forces and incorporate comprehensive waterproofing systems in accordance with current

industry standards and construction methods. If any related project requires permanent dewatering systems, such systems would be regulated by the SWRCB. Should excavation for other related projects extend beneath the groundwater level, temporary groundwater dewatering systems will be designed and implemented in accordance with SWRCB permit requirements. These dewatering operations would be limited to temporary and local impact to the groundwater level. Based on the above, cumulative impacts to groundwater hydrology would be less than significant.

6.3.4. GROUNDWATER QUALITY

Future growth in the Los Angeles Coastal Plain Central Subbasin would be subject to LA RWQCB requirements relating to groundwater quality. In addition, since the Project is located in a highly urbanized area, future land use changes or development are not likely to cause substantial changes in regional groundwater quality. As noted above, the Project does not have an adverse impact on groundwater quality. Also, it is anticipated that the Project and other future development projects would also be subject to LARWQCB requirements and implementation of measures to comply with total maximum daily loads. Therefore, based on the fact that the Project does not have an adverse impact and through compliance with all applicable laws, rules and regulations, cumulative impacts to groundwater quality would be less than significant.

7. 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.

APPENDIX

COUNTY OF LOS ANGELES

LOS ANGELES RIVER WATERSHED

Figure 1 - Los Angeles River Watershed Map

Figure 2 - Existing Drainage Exhibit

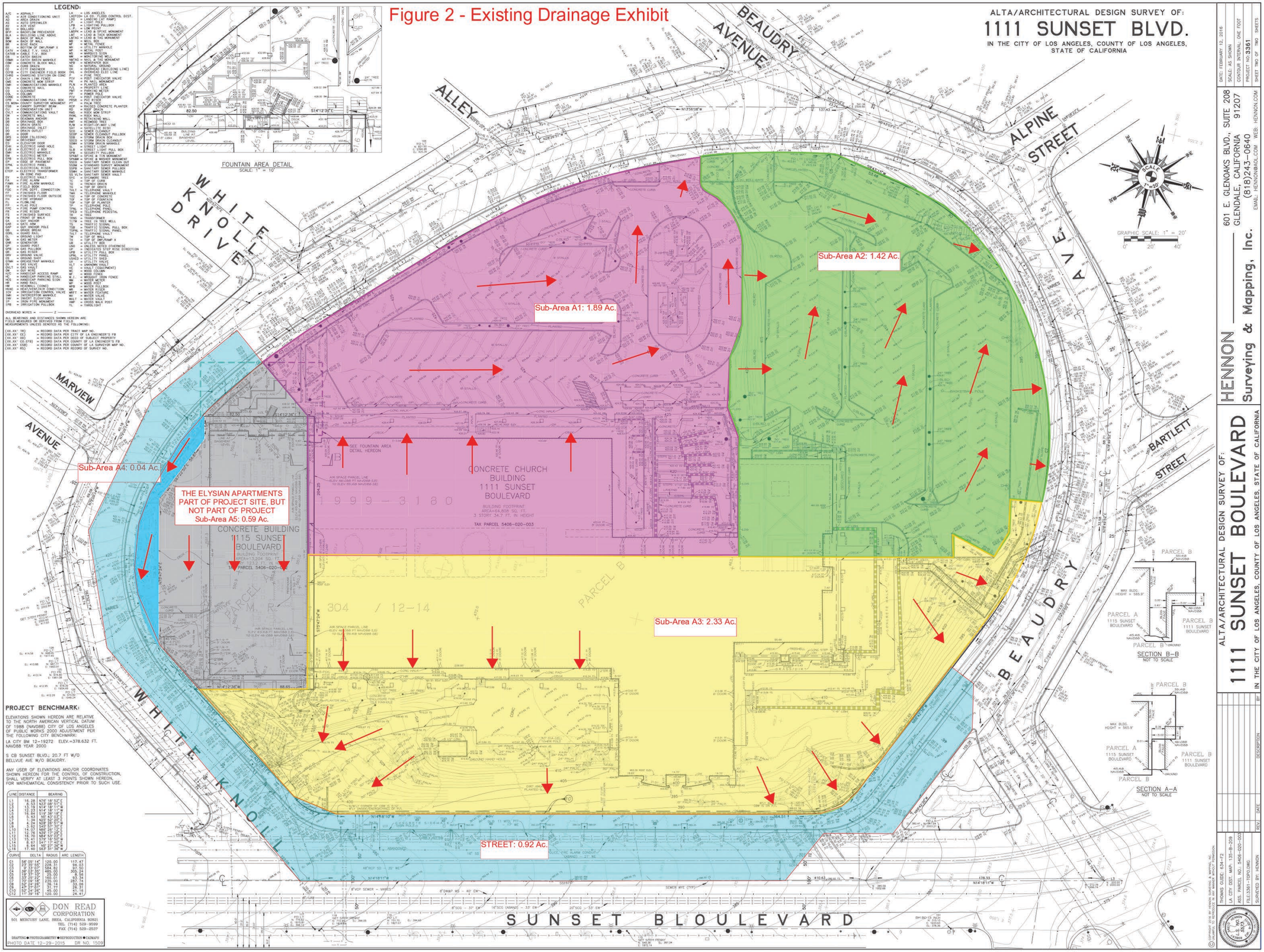


FIGURE 3 PROPOSED DRAINAGE EXHIBIT

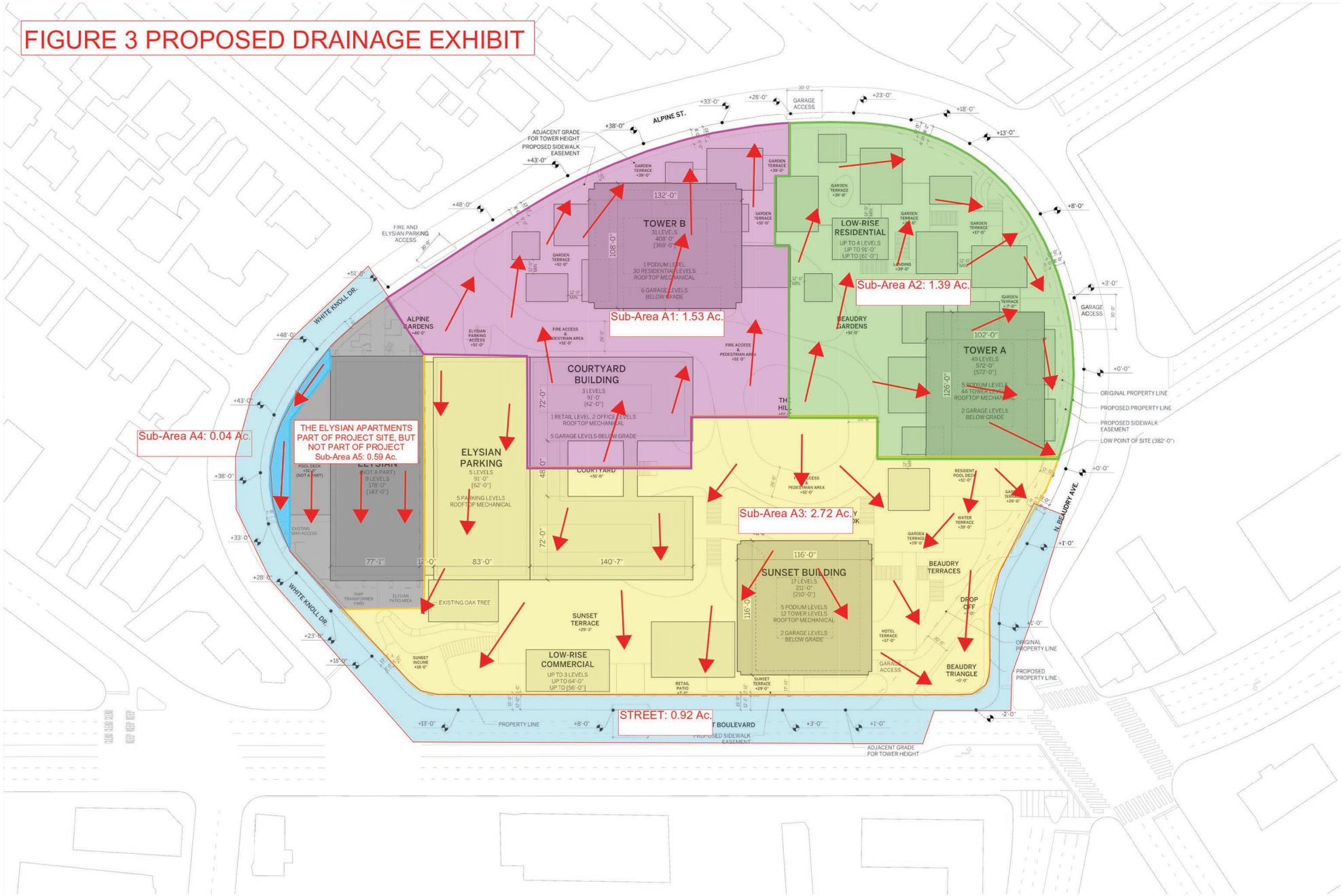


Figure 4- Hydro-Calc Hydrology Results for Existing and Proposed Site

Peak Flow Hydrologic Analysis

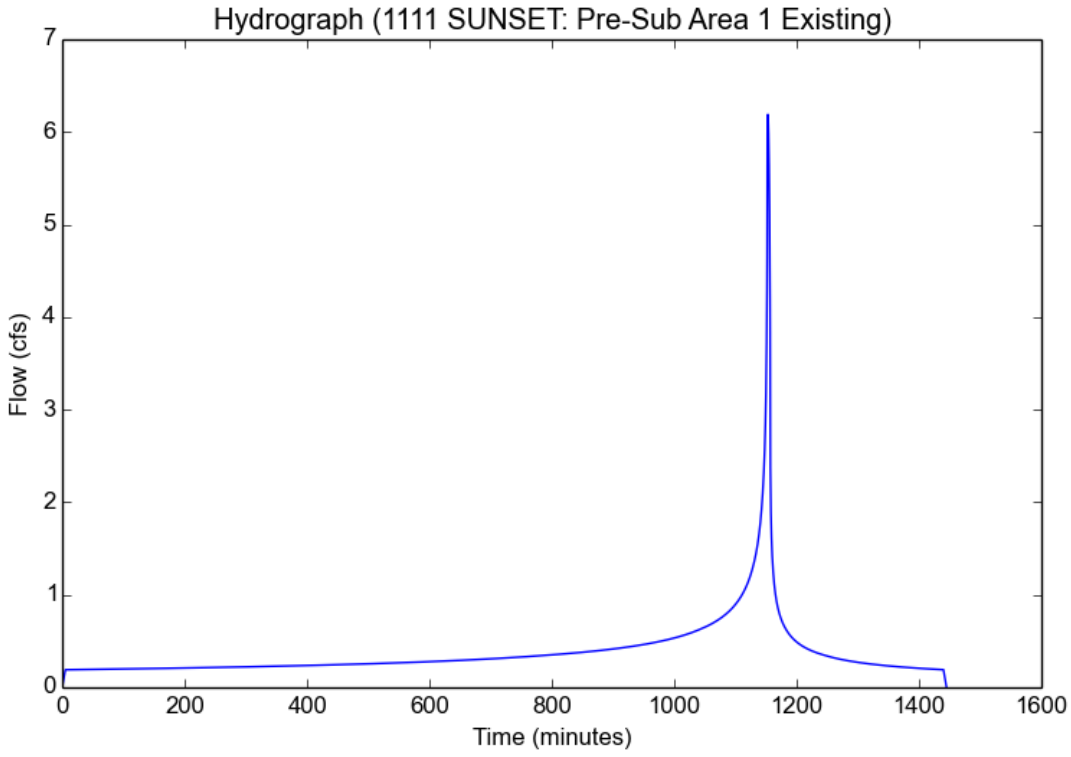
File location: //kpfflacivil.com/share/Projects/2015/115403 1111 Sunset Blvd/ENGR/EIR Support/Water Resources Report/Archive/Exisiting Draiange - Hy
Version: HydroCalc 1.0.2

Input Parameters

Project Name	1111 SUNSET
Subarea ID	Pre-Sub Area 1 Existing
Area (ac)	1.89
Flow Path Length (ft)	400.0
Flow Path Slope (vft/hft)	0.03
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.8
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8991
Developed Runoff Coefficient (Cd)	0.8998
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	6.1894
Burned Peak Flow Rate (cfs)	6.1894
24-Hr Clear Runoff Volume (ac-ft)	0.7649
24-Hr Clear Runoff Volume (cu-ft)	33319.0778



Peak Flow Hydrologic Analysis

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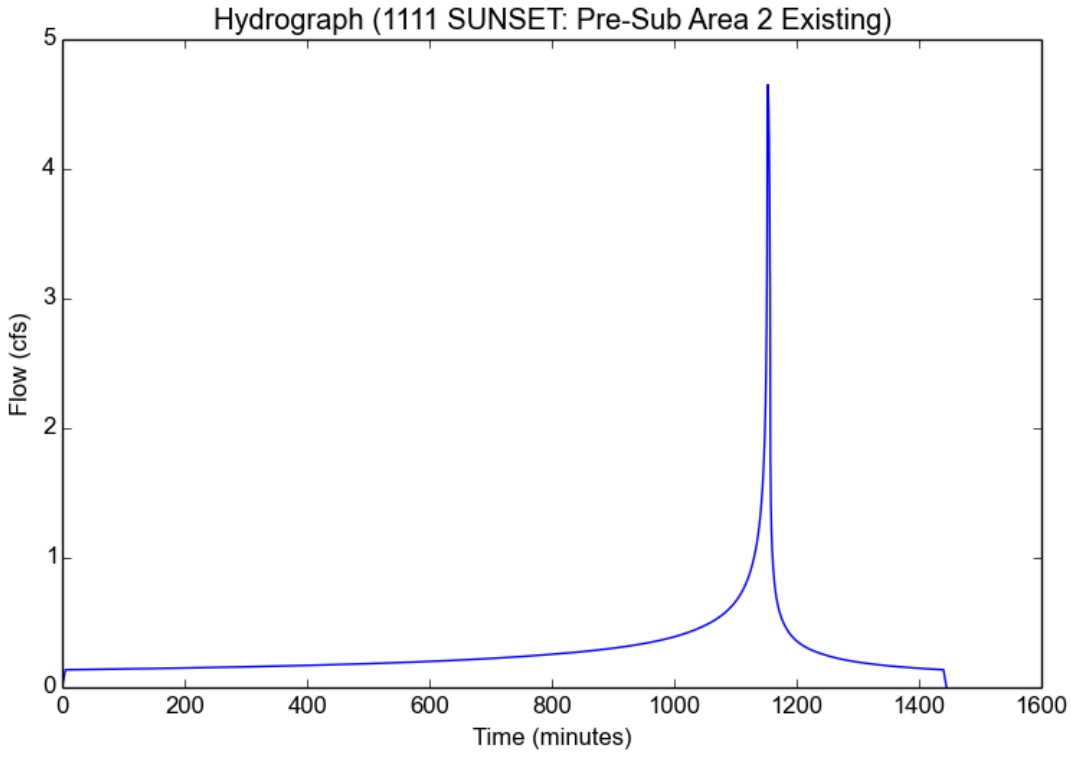
Version: HydroCalc 1.0.2

Input Parameters

Project Name	1111 SUNSET
Subarea ID	Pre-Sub Area 2 Existing
Area (ac)	1.42
Flow Path Length (ft)	200.0
Flow Path Slope (vft/hft)	0.09
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.75
Soil Type	2
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)	0.8991
Developed Runoff Coefficient (Cd)	0.8998
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.65
Burned Peak Flow Rate (cfs)	4.65
24-Hr Clear Runoff Volume (ac-ft)	0.5573
24-Hr Clear Runoff Volume (cu-ft)	24275.5043



Peak Flow Hydrologic Analysis

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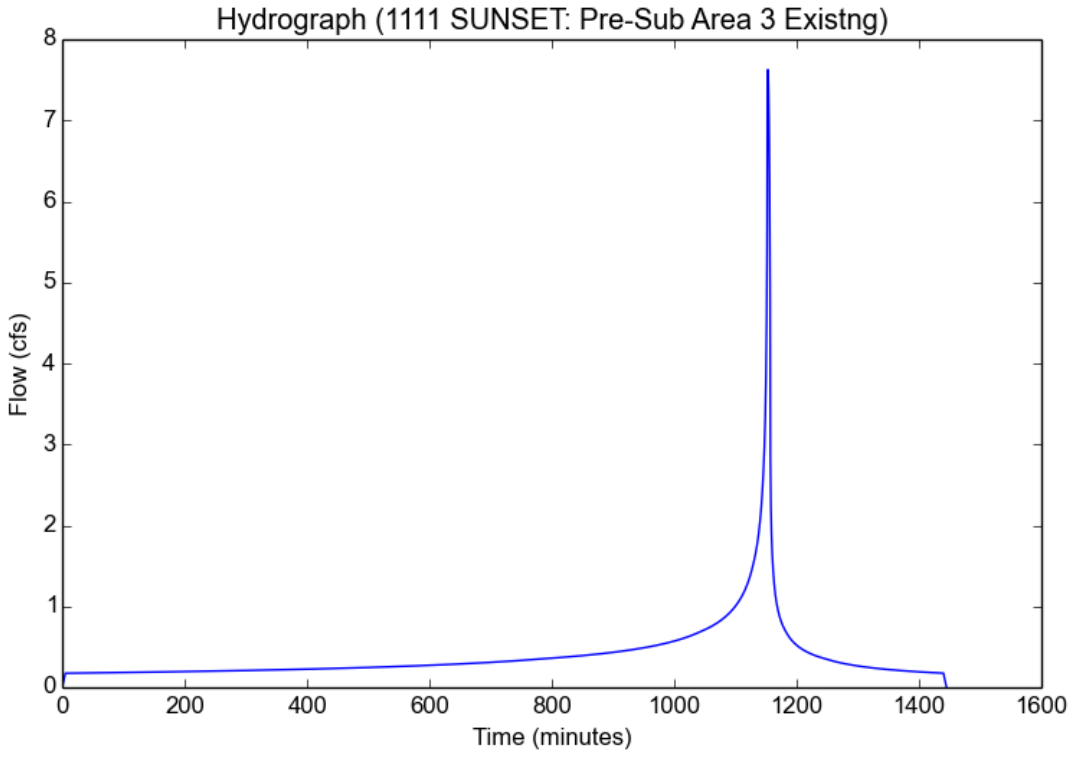
Version: HydroCalc 1.0.2

Input Parameters

Project Name	1111 SUNSET
Subarea ID	Pre-Sub Area 3 Existng
Area (ac)	2.33
Flow Path Length (ft)	260.0
Flow Path Slope (vft/hft)	0.06
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.55
Soil Type	2
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)	0.8991
Developed Runoff Coefficient (Cd)	0.8996
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	7.6285
Burned Peak Flow Rate (cfs)	7.6285
24-Hr Clear Runoff Volume (ac-ft)	0.8002
24-Hr Clear Runoff Volume (cu-ft)	34858.1074



Peak Flow Hydrologic Analysis

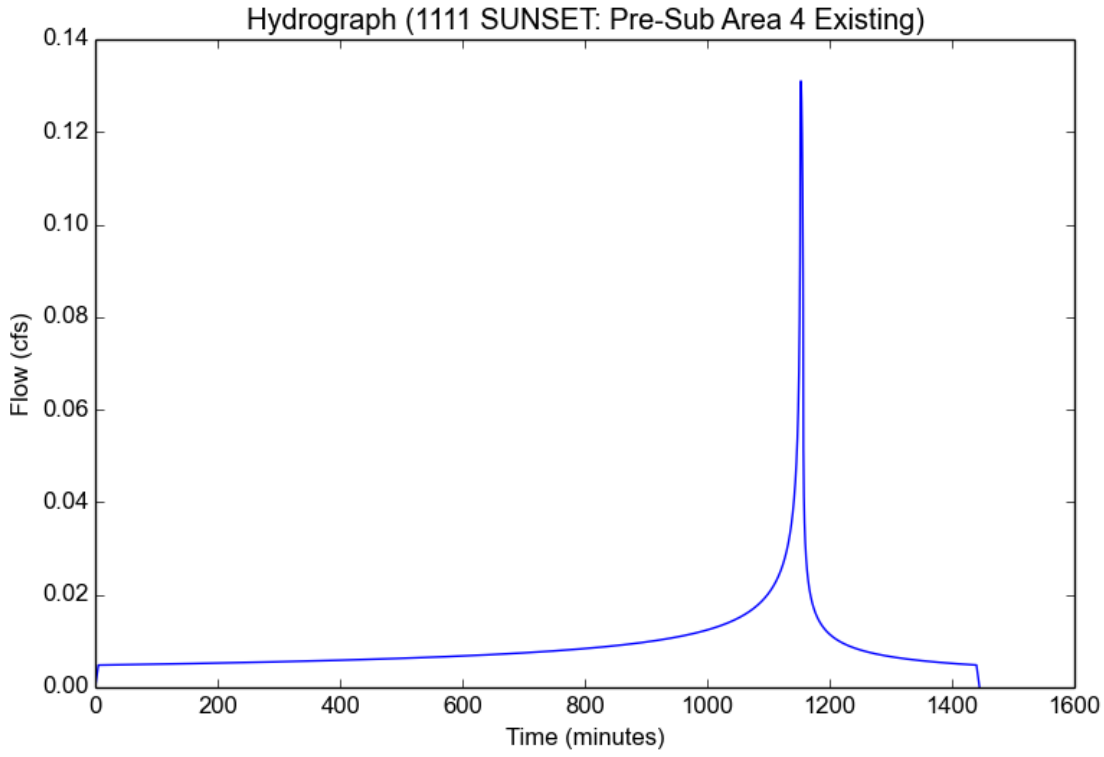
File location: //kpfflacivil.com/share/Projects/2015/115403 1111 Sunset Blvd/ENGR/EIR Support/Water Resources Report/Archive/Exisiting Draiange - Hy
Version: HydroCalc 1.0.2

Input Parameters

Project Name	1111 SUNSET
Subarea ID	Pre-Sub Area 4 Existing
Area (ac)	0.04
Flow Path Length (ft)	70.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.99
Soil Type	2
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)	0.8991
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.131
Burned Peak Flow Rate (cfs)	0.131
24-Hr Clear Runoff Volume (ac-ft)	0.0181
24-Hr Clear Runoff Volume (cu-ft)	786.2905



Peak Flow Hydrologic Analysis

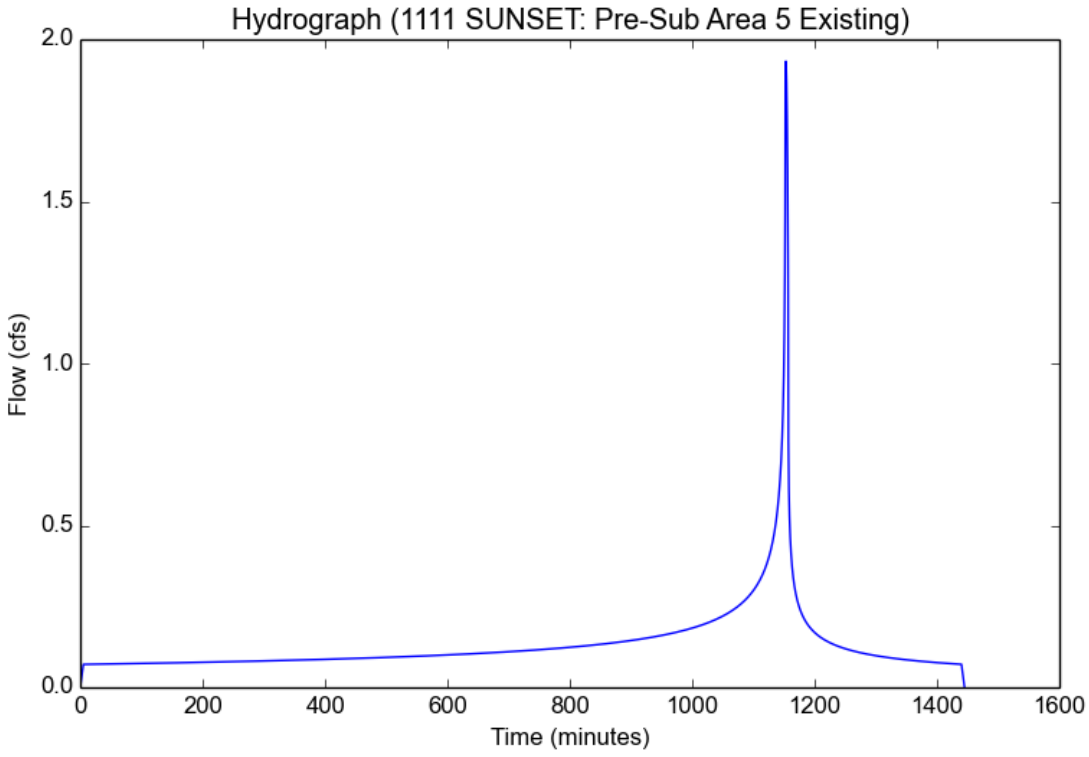
File location: //kpfflacivil.com/share/Projects/2015/115403 1111 Sunset Blvd/ENGR/EIR Support/Water Resources Report/Archive/Exisiting Draiange - Hy
Version: HydroCalc 1.0.2

Input Parameters

Project Name	1111 SUNSET
Subarea ID	Pre-Sub Area 5 Existing
Area (ac)	0.59
Flow Path Length (ft)	125.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.99
Soil Type	2
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)	0.8991
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.9325
Burned Peak Flow Rate (cfs)	1.9325
24-Hr Clear Runoff Volume (ac-ft)	0.2662
24-Hr Clear Runoff Volume (cu-ft)	11597.7852



Peak Flow Hydrologic Analysis

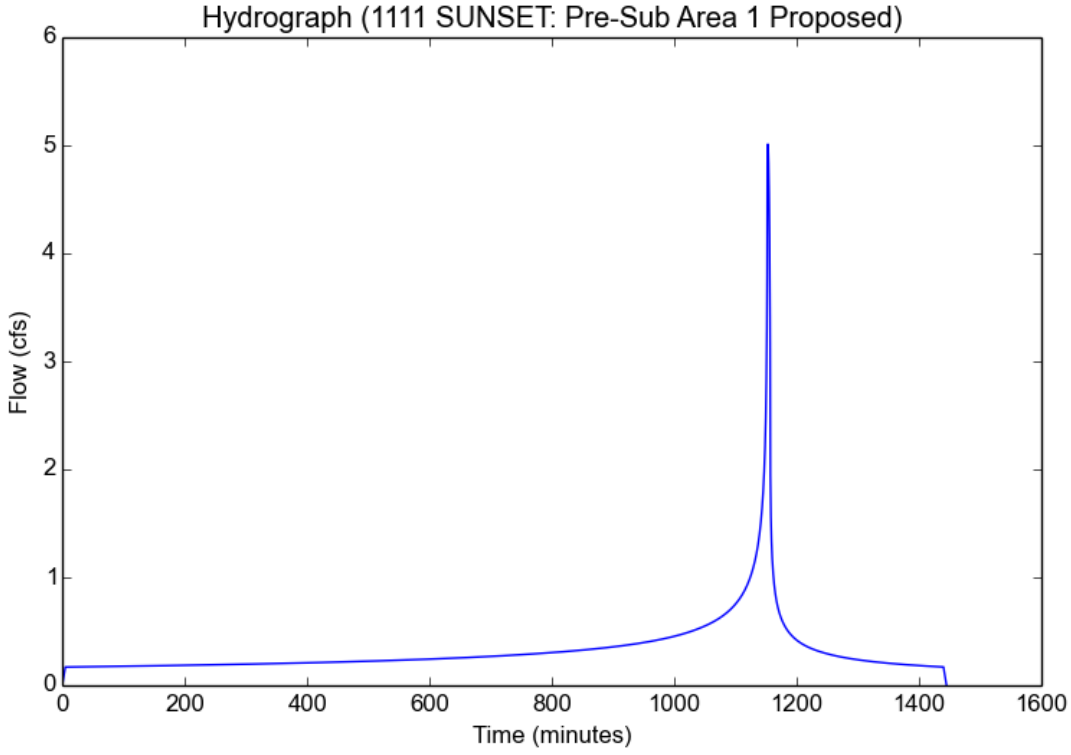
File location: //kpfflacivil.com/share/Projects/2015/115403 1111 Sunset Blvd/ENGR/EIR Support/Water Resources Report/Archive/Proposed Draiange - H
Version: HydroCalc 1.0.2

Input Parameters

Project Name	1111 SUNSET
Subarea ID	Pre-Sub Area 1 Proposed
Area (ac)	1.53
Flow Path Length (ft)	380.0
Flow Path Slope (vft/hft)	0.03
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.9
Soil Type	2
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)	0.8991
Developed Runoff Coefficient (Cd)	0.8999
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.011
Burned Peak Flow Rate (cfs)	5.011
24-Hr Clear Runoff Volume (ac-ft)	0.6567
24-Hr Clear Runoff Volume (cu-ft)	28605.7581



Peak Flow Hydrologic Analysis

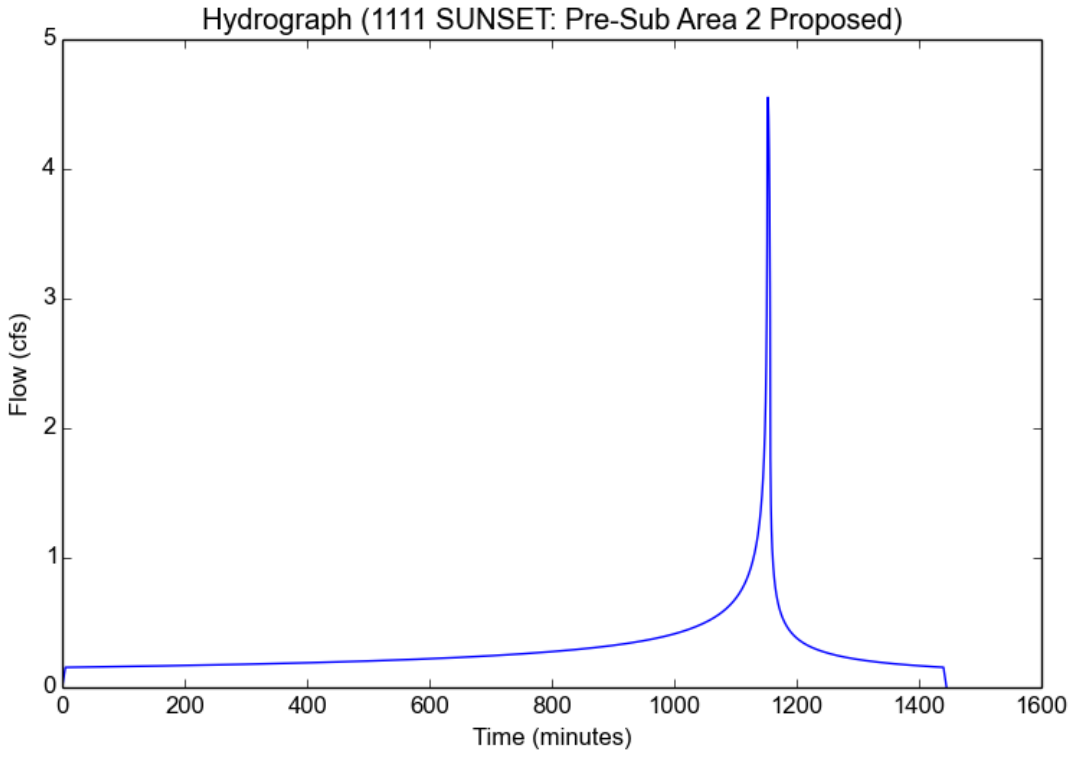
File location: //kpfflacivil.com/share/Projects/2015/115403 1111 Sunset Blvd/ENGR/EIR Support/Water Resources Report/Archive/Proposed Draiange - H
Version: HydroCalc 1.0.2

Input Parameters

Project Name	1111 SUNSET
Subarea ID	Pre-Sub Area 2 Proposed
Area (ac)	1.39
Flow Path Length (ft)	240.0
Flow Path Slope (vft/hft)	0.09
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.9
Soil Type	2
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)	0.8991
Developed Runoff Coefficient (Cd)	0.8999
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.5525
Burned Peak Flow Rate (cfs)	4.5525
24-Hr Clear Runoff Volume (ac-ft)	0.5966
24-Hr Clear Runoff Volume (cu-ft)	25988.2378



Peak Flow Hydrologic Analysis

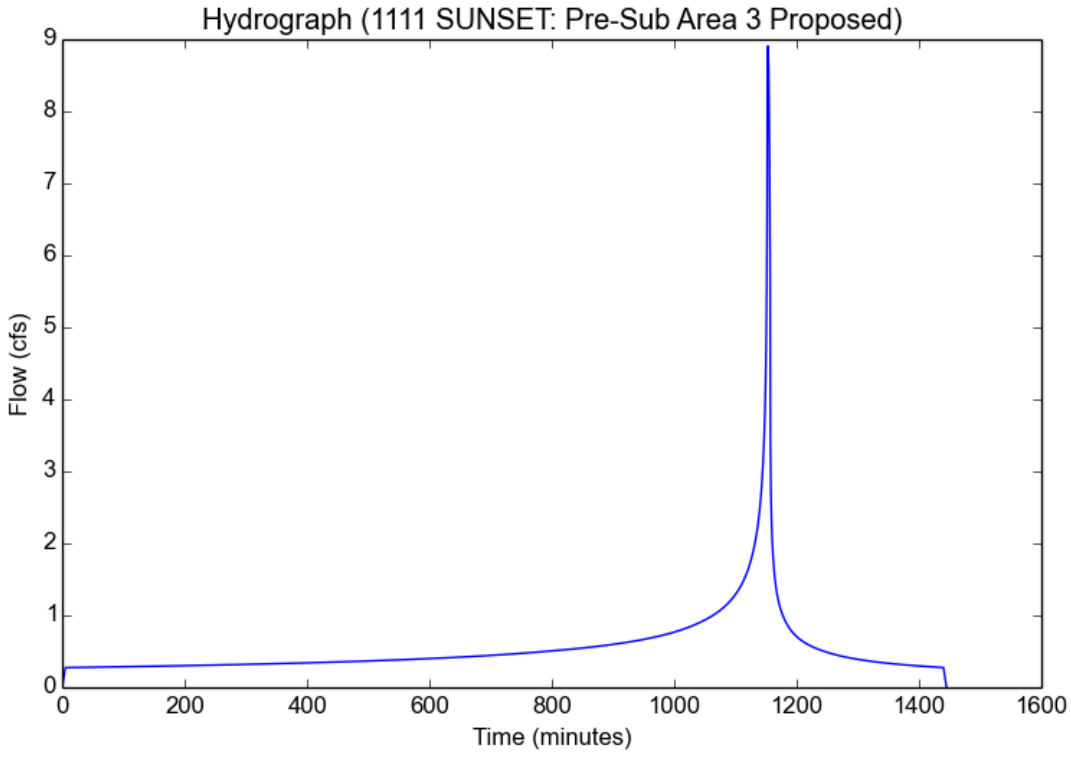
File location: //kpfflacivil.com/share/Projects/2015/115403 1111 Sunset Blvd/ENGR/EIR Support/Water Resources Report/Archive/Proposed Draiange - H
Version: HydroCalc 1.0.2

Input Parameters

Project Name	1111 SUNSET
Subarea ID	Pre-Sub Area 3 Proposed
Area (ac)	2.72
Flow Path Length (ft)	280.0
Flow Path Slope (vft/hft)	0.06
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.8
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	3.6394
Undeveloped Runoff Coefficient (Cu)	0.8991
Developed Runoff Coefficient (Cd)	0.8998
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	8.9076
Burned Peak Flow Rate (cfs)	8.9076
24-Hr Clear Runoff Volume (ac-ft)	1.1008
24-Hr Clear Runoff Volume (cu-ft)	47951.2655



Peak Flow Hydrologic Analysis

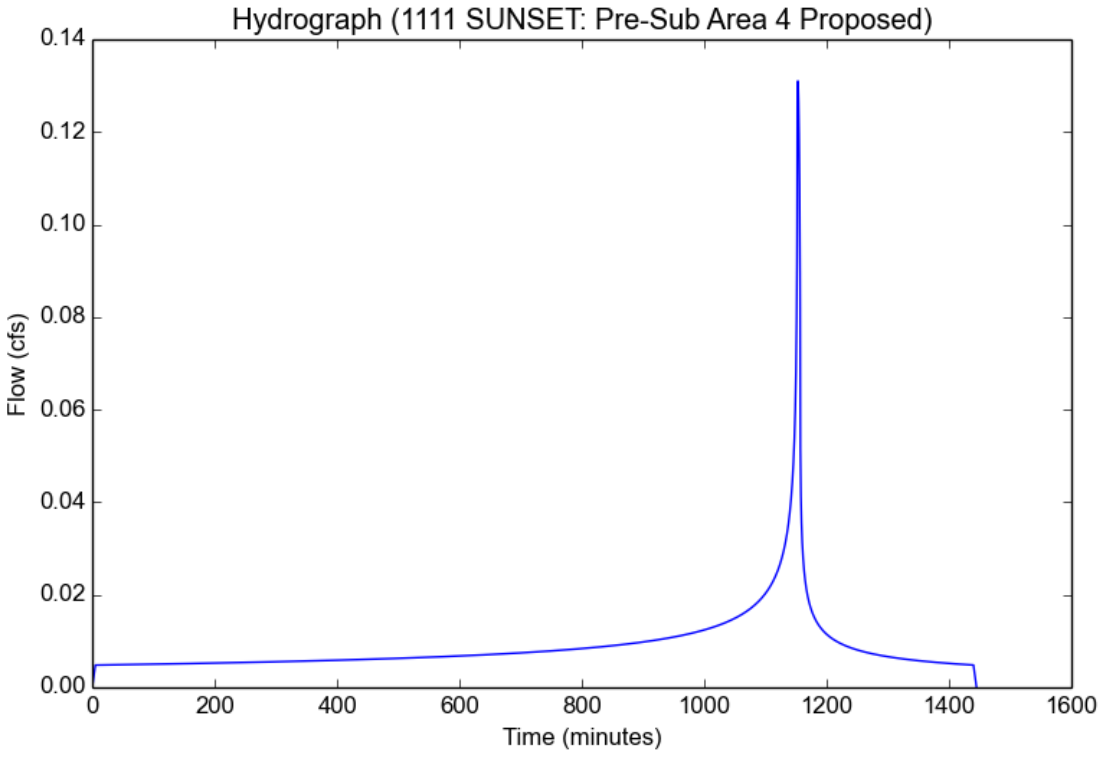
File location: //kpfflacivil.com/share/Projects/2015/115403 1111 Sunset Blvd/ENGR/EIR Support/Water Resources Report/Archive/Proposed Draiange - H
Version: HydroCalc 1.0.2

Input Parameters

Project Name	1111 SUNSET
Subarea ID	Pre-Sub Area 4 Proposed
Area (ac)	0.04
Flow Path Length (ft)	70.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.99
Soil Type	2
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)	0.8991
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.131
Burned Peak Flow Rate (cfs)	0.131
24-Hr Clear Runoff Volume (ac-ft)	0.0181
24-Hr Clear Runoff Volume (cu-ft)	786.2905



Peak Flow Hydrologic Analysis

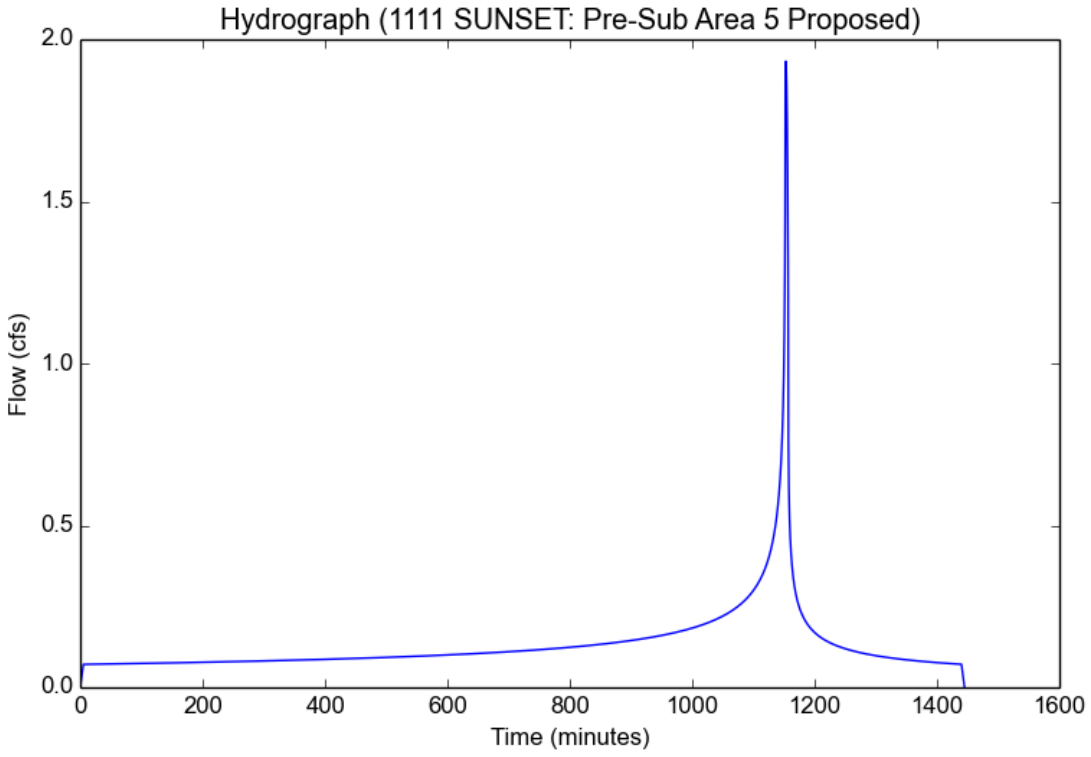
File location: //kpfflacivil.com/share/Projects/2015/115403 1111 Sunset Blvd/ENGR/EIR Support/Water Resources Report/Archive/Proposed Draiange - H
Version: HydroCalc 1.0.2

Input Parameters

Project Name	1111 SUNSET
Subarea ID	Pre-Sub Area 5 Proposed
Area (ac)	0.59
Flow Path Length (ft)	125.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	0.99
Soil Type	2
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)	0.8991
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.9325
Burned Peak Flow Rate (cfs)	1.9325
24-Hr Clear Runoff Volume (ac-ft)	0.2662
24-Hr Clear Runoff Volume (cu-ft)	11597.7852



Peak Flow Hydrologic Analysis

File location: P:/2015/115403 1111 Sunset Blvd/ENGR/EIR Support/Water Resources Report/Archive/1111 SUNSET - STREET.pdf
Version: HydroCalc 1.0.2

Input Parameters

Project Name	1111 SUNSET
Subarea ID	STREET
Area (ac)	0.92
Flow Path Length (ft)	788.0
Flow Path Slope (vft/hft)	0.01
50-yr Rainfall Depth (in)	6.1
Percent Impervious	1.0
Soil Type	2
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.1
Peak Intensity (in/hr)	2.7609
Undeveloped Runoff Coefficient (Cu)	0.8731
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	2.286
Burned Peak Flow Rate (cfs)	2.286
24-Hr Clear Runoff Volume (ac-ft)	0.4174
24-Hr Clear Runoff Volume (cu-ft)	18182.8985

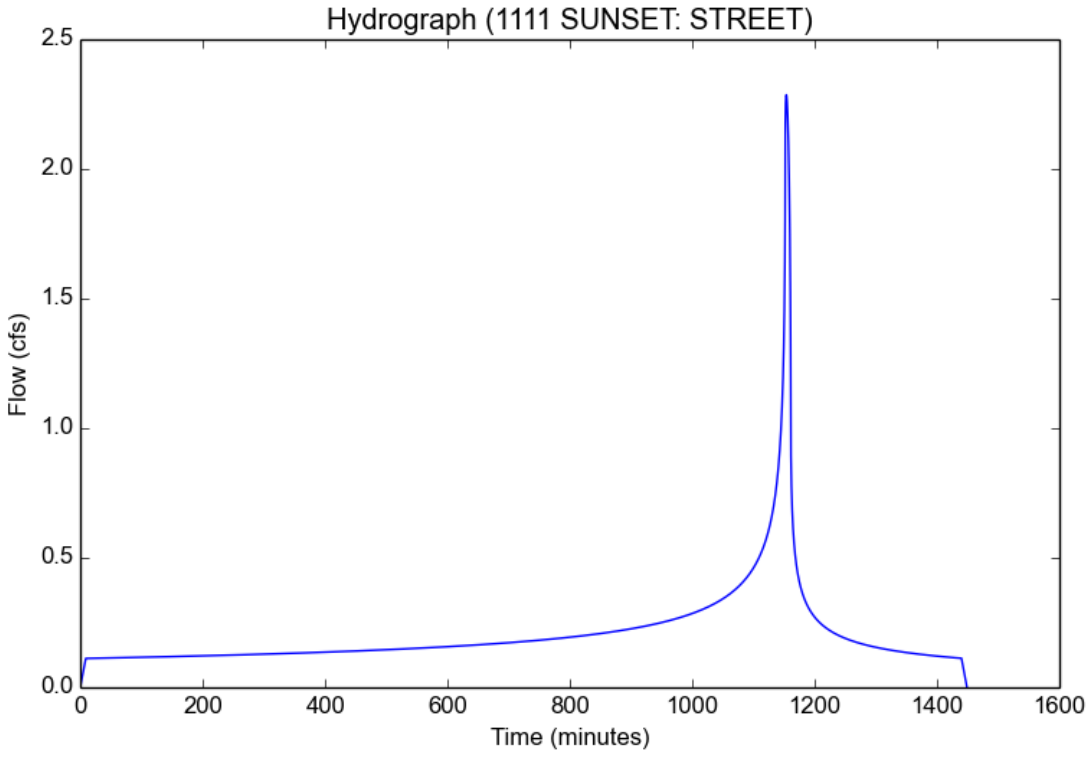


Figure 5 - Los Angeles Coastal GW Basins

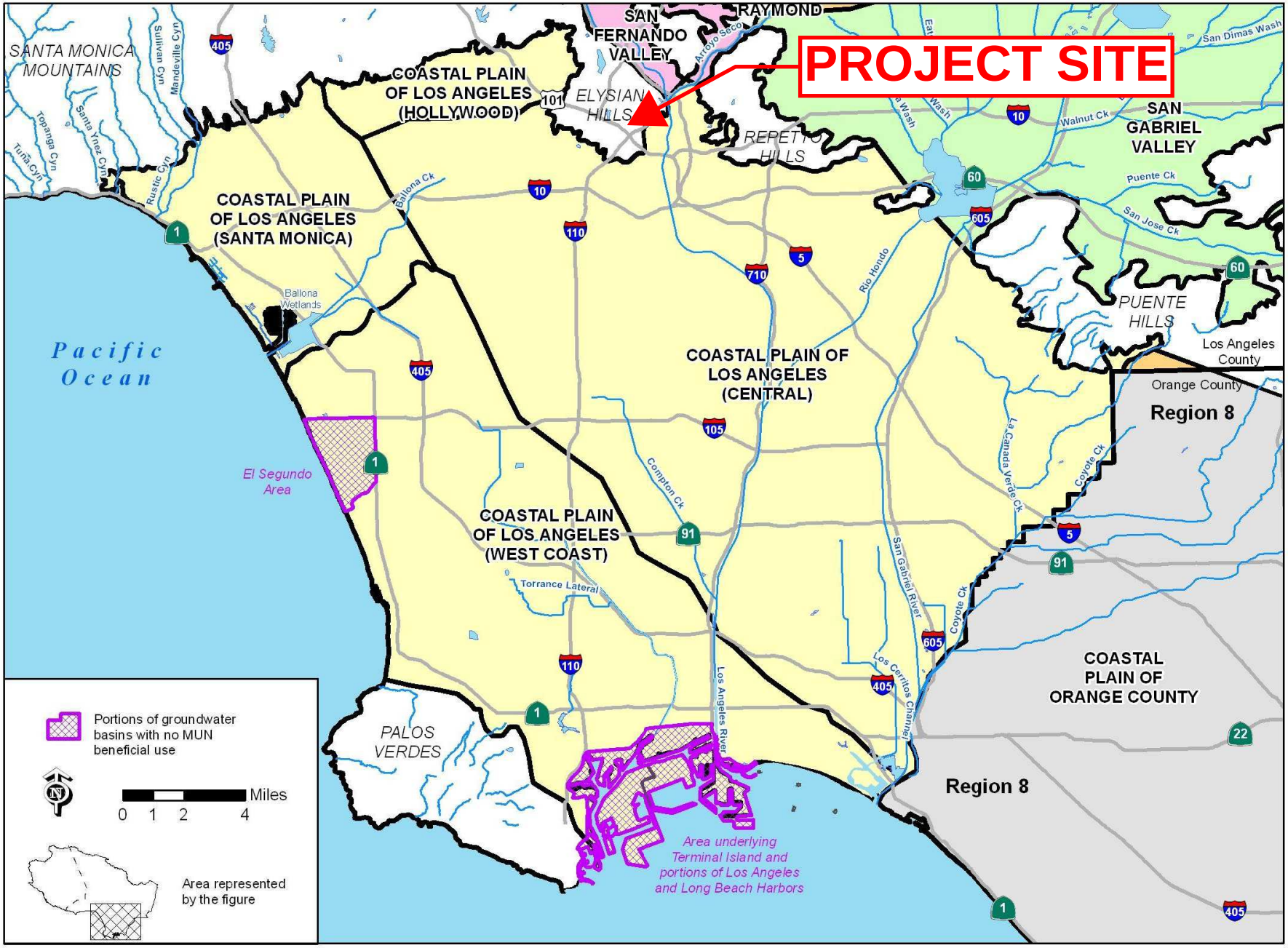


Figure 5 **Los Angeles Coastal Groundwater Basins.**

Figure 6 - LID Calculation Result for Capture & Use & Planter Box Sizing

Capture & Use Sizing

Note:

Red values to be changed by user.
Black values are automatically calculated.

[1]	Total Area (SF)		272918
[2]	Impervious Area (SF)		245626
[3]	Pervious Area (SF)	**[1]-[2] =**	27292
[4]	Catchment Area (SF)	**([2]*0.9)+([3]*0.1) =**	223793
[5]	Design Rainfall Depth (in)	**Greater of 0.75", 85th percentile**	0.95
[6]	V_{design} (gal)	**[5]/12*7.48*[4] =**	**132523**
[7]	Planting Area (SF)		27292
[8]	Plant Factor*		0.5
[9]	$ETWU_{(7\text{-month})}$	**21.7*0.62*[8]*[7] =**	183593
[10]	Is $V_{design} \leq ETWU_{(7\text{-month})}$?		**YES**

*The plant factor used shall be from WUCOLS. The plant factor ranges from 0 to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, and from 0.7 to 1.0 for high water use plants.

Source: LID Handbook, City of LA (May 2012)

Figure 6 - LID Calculation Result for Capture & Use & Planter Box Sizing

Planter Box Sizing

Note:	Red values to be changed by user.
	Black values are automatically calculated.

[1]	Total Area (SF)		272918
[2]	Impervious Area (SF)		245626
[3]	Pervious Area (SF)	**[1]-[2] =**	27292
[4]	Catchment Area (SF)	**([2]*0.9)+([3]*0.1) =**	223793
[5]	Design Rainfall Depth (in)	**Greater of 0.75", 85th percentile**	1.0
[6]	V_{design} (CF)	**1.5*[5]/12*[4] =**	26575
[7]	$K_{sat,media}$ (in/hr)		5.0
[8]	FS	**Use 6 if no geotech investigation**	2.0
[9]	$K_{sat,design}$ (in/hr)	**[7]/[8] =**	2.5
[10]	d_{p_max}, Max. Ponding Depth (ft)	**MIN(1, [9]*48/12) =**	1.0
[11]	d_p, Ponding Depth (ft)	**1' max.**	1.0
[12]	T_{fill} (hr)		3
[13]	**A_{min} (sq. ft)**	**[6]/([9]*[12]/12 + [11])**	**16354**

Source: LID Handbook, City of LA (May 2012)

Figure 7 - Los Angeles 50 year Isohyet Map

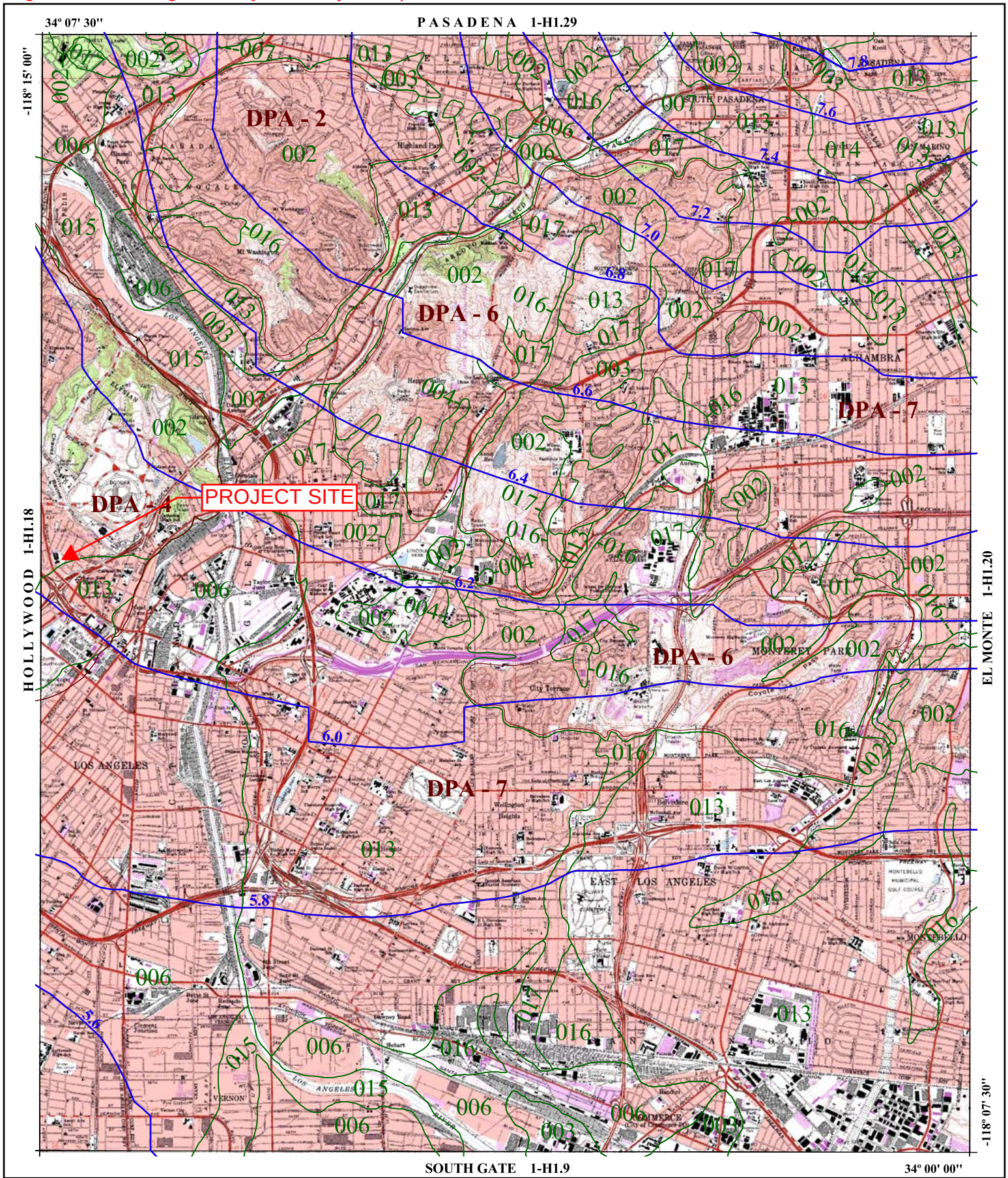
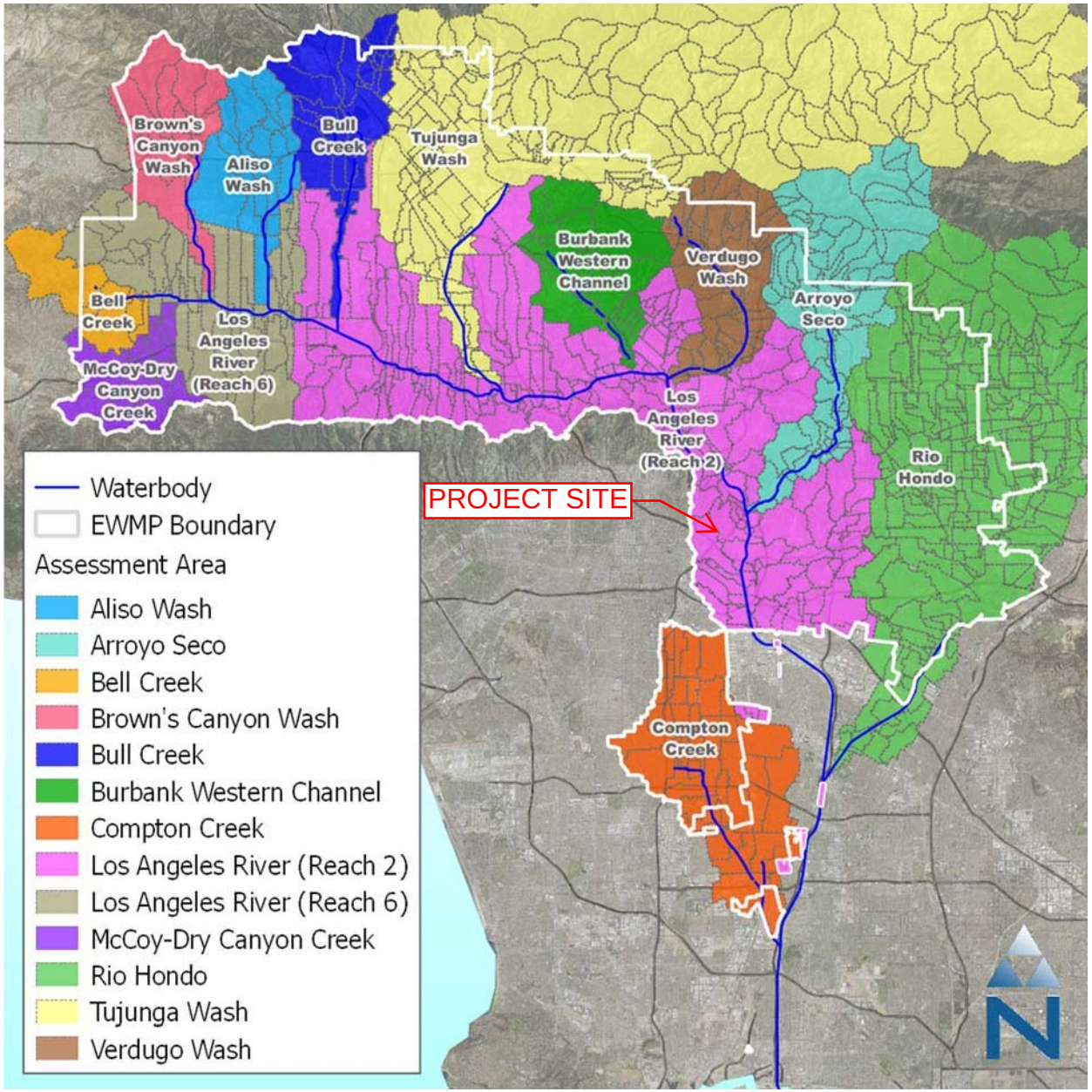
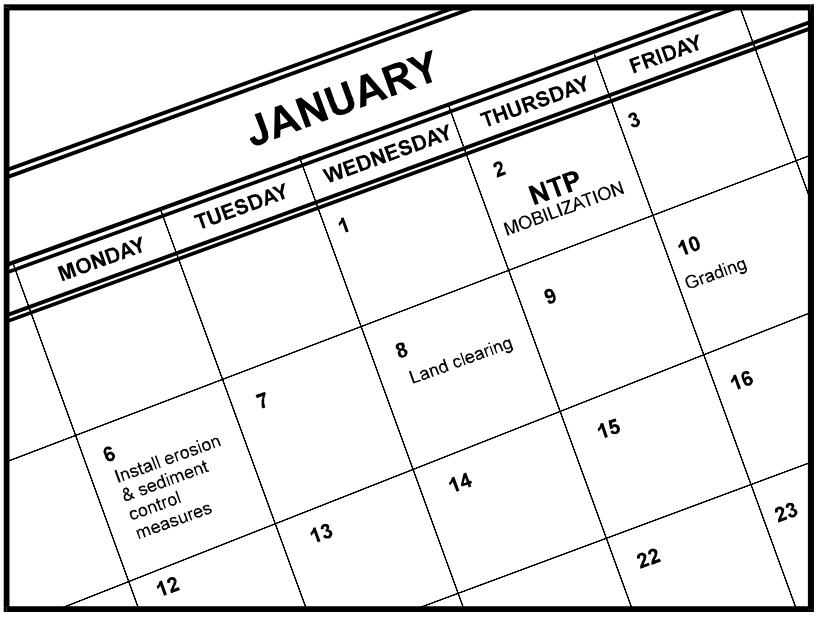


Figure 8 - Los Angeles River Watershed Map



Scheduling EC-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 Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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.

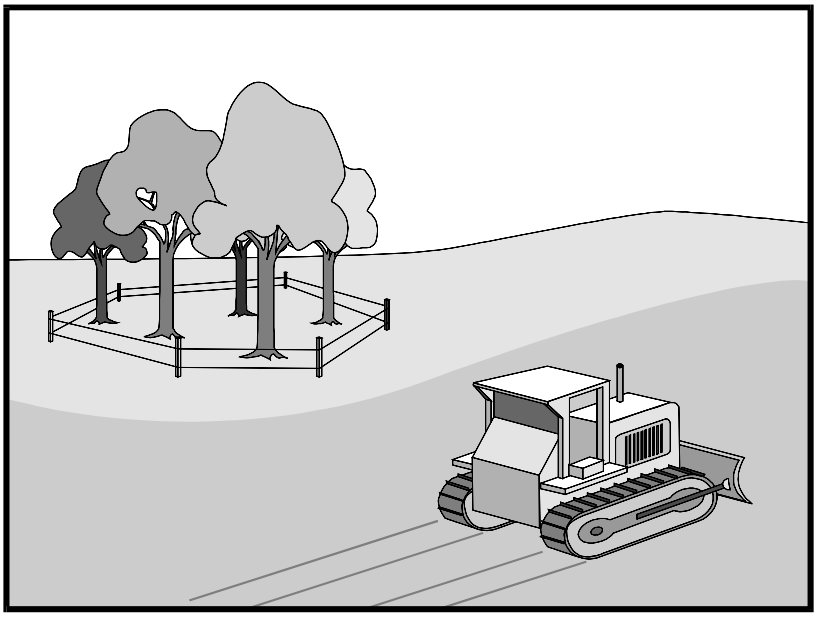
Limitations

- 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

Preservation Of Existing Vegetation EC-2



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.

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**

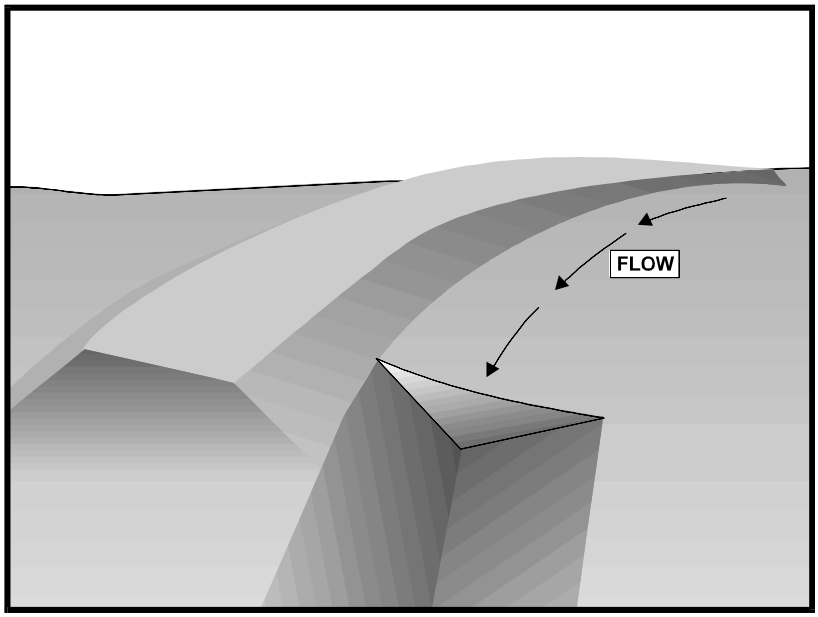
Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Earth Dikes and Drainage Swales EC-9



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**

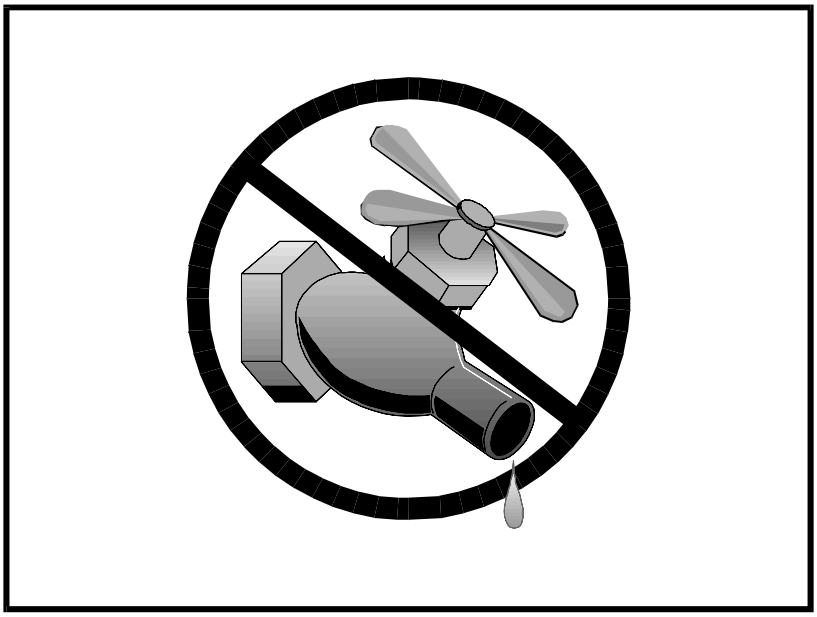
Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Water Conservation Practices NS-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 Objective**
☒ **Secondary Objective**

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

Potential Alternatives

None

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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.

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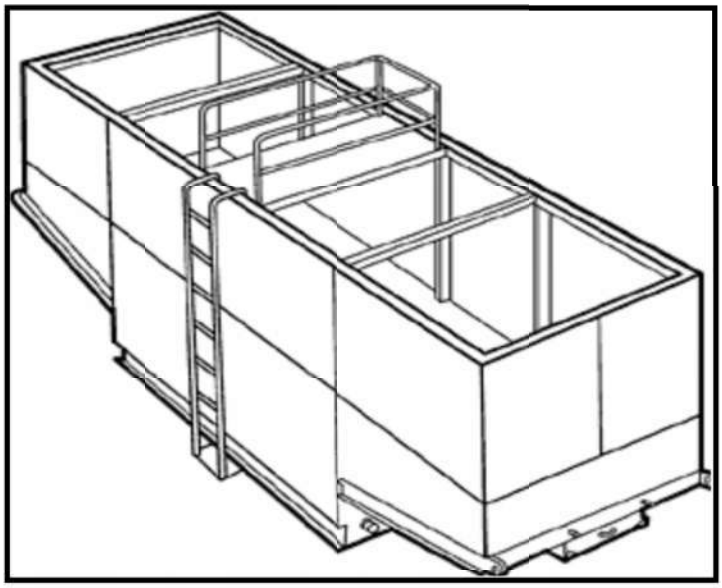
Dewatering Operations NS-2



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**

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

Potential Alternatives

SE-5: Fiber Roll

SE-6: Gravel Bag Berm

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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.

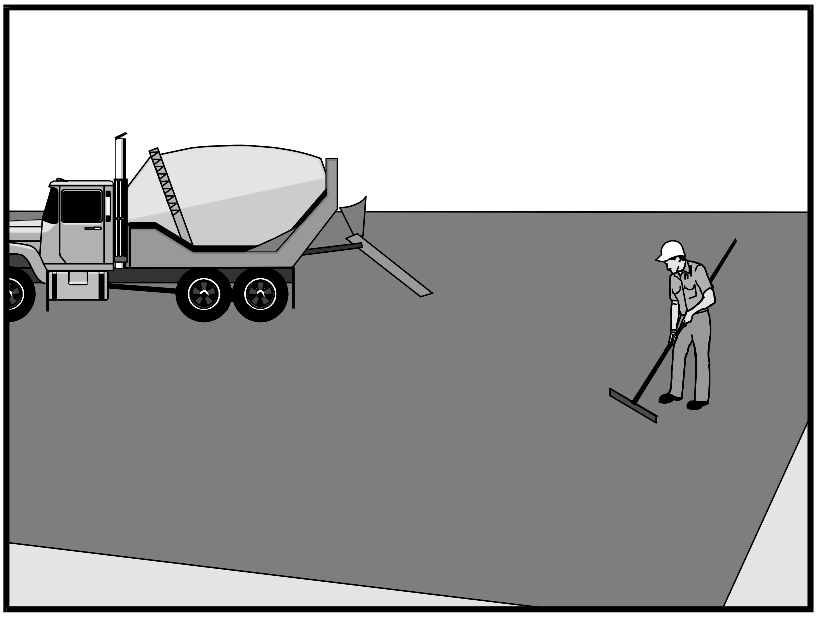
The dewatering operations described in this fact sheet are not Active Treatment Systems (ATS) and do not include the use of chemical coagulations, chemical flocculation or electrocoagulation.

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

Paving and Grinding Operations NS-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 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

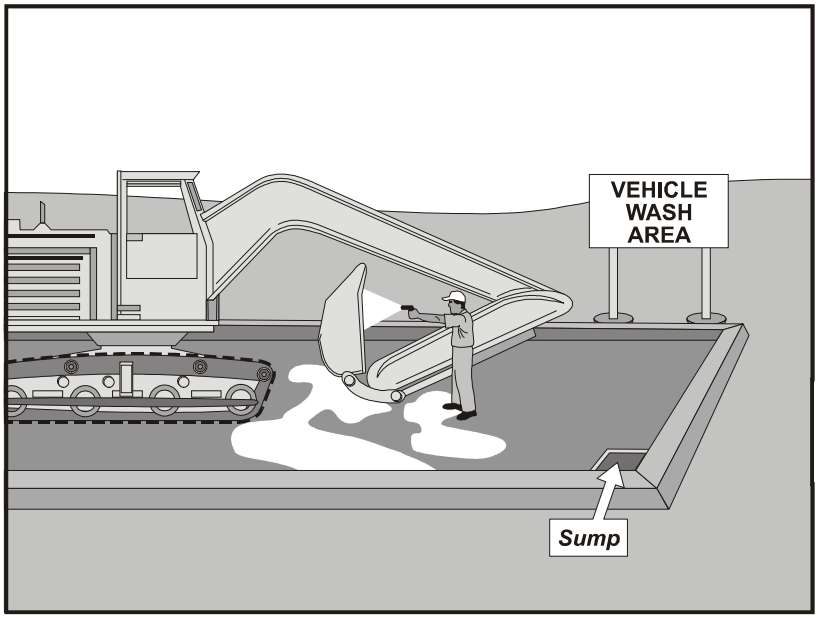
These procedures are implemented where paving, surfacing, resurfacing, or sawcutting, may pollute stormwater runoff or discharge to the storm drain system or watercourses.

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

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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:

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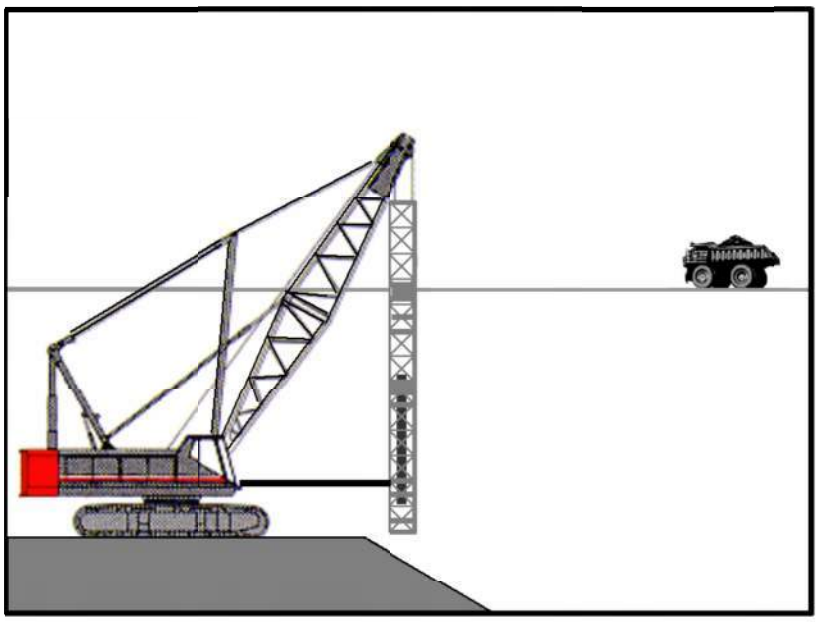
Pile Driving Operations NS-11



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

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.

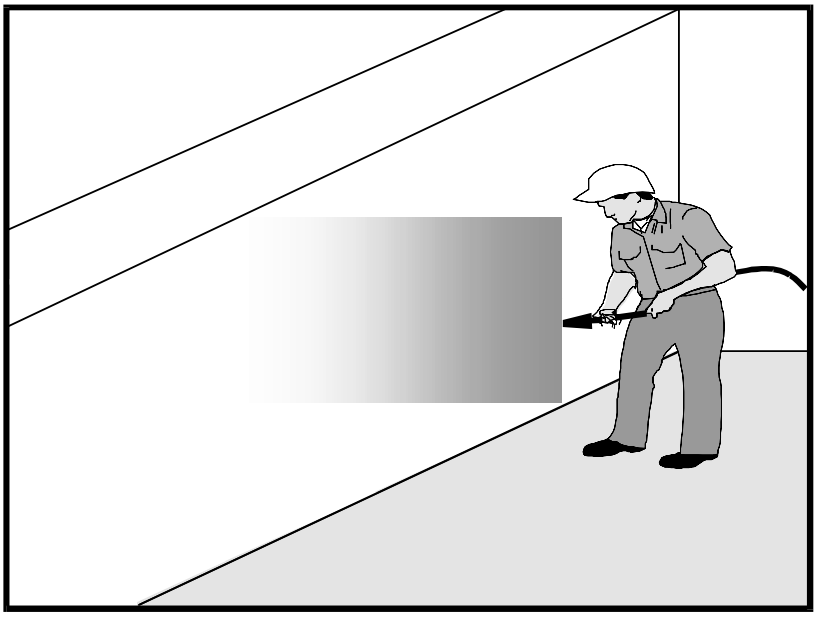
Limitations

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.

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.

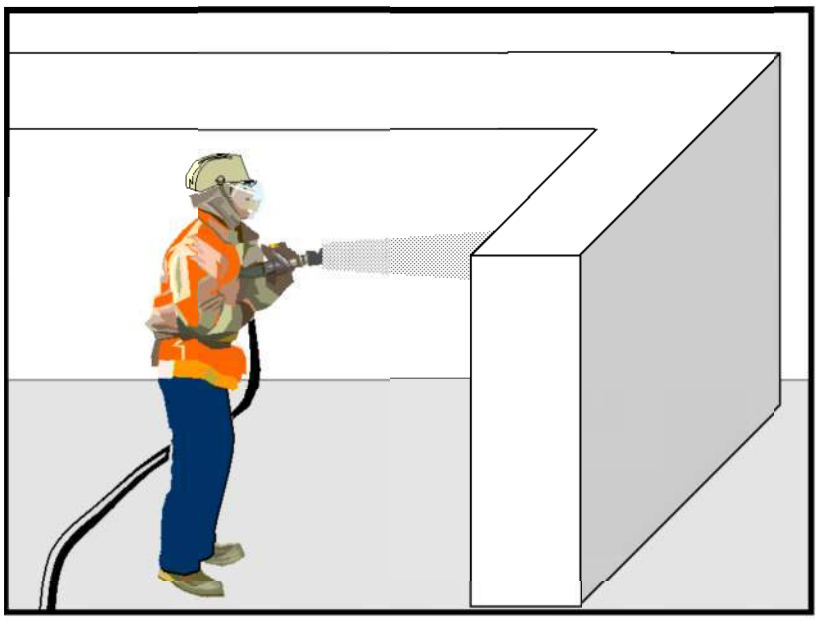
Suitable Applications

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

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.

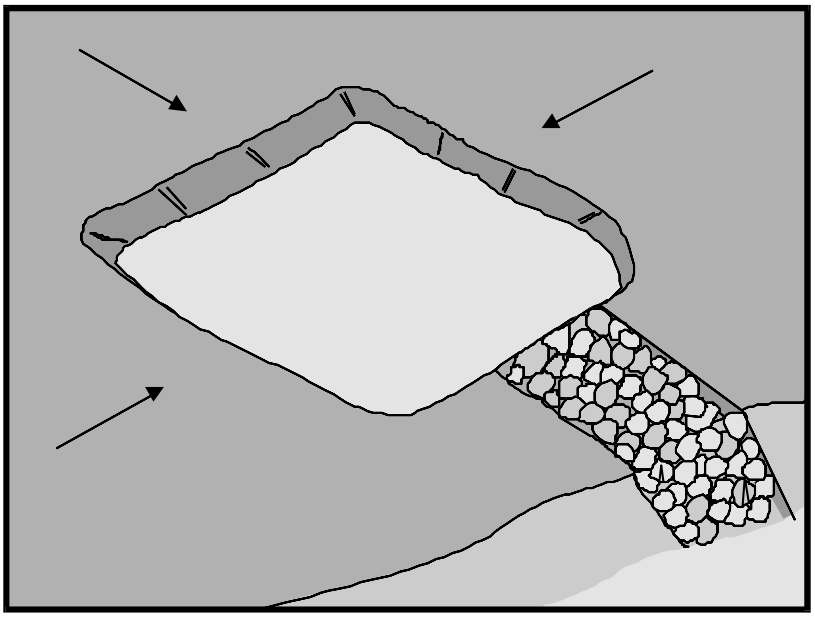
The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

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.

Sediment Trap SE-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

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.

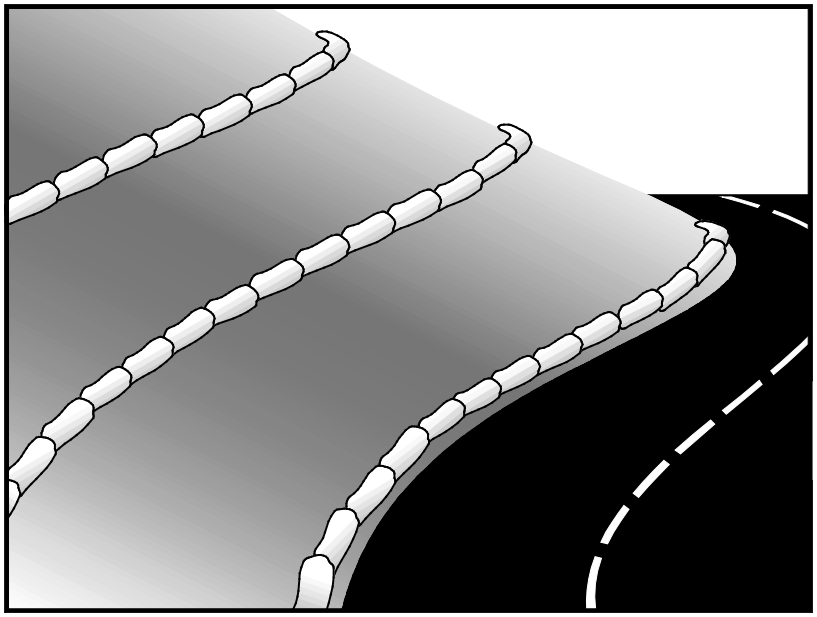
Trap design guidance provided in this fact sheet is not intended to guarantee compliance with numeric discharge limits (numeric action levels or numeric effluent limits for turbidity). Compliance with discharge limits requires a thoughtful approach to comprehensive BMP planning, implementation, and maintenance. 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



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 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

Street Sweeping and Vacuuming SE-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

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.

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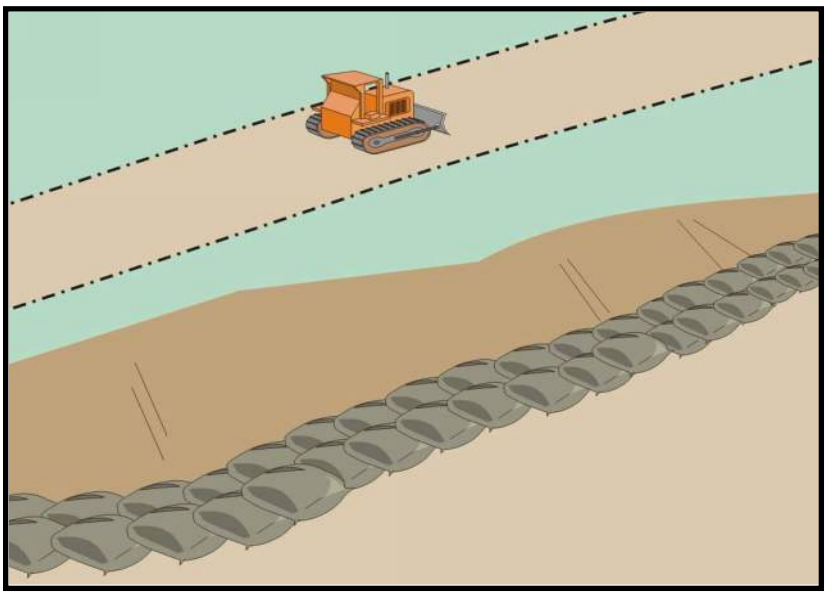
CALIFORNIA STORMWATER QUALITY ASSOCIATION

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**

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.

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

Potential Alternatives

SE-1 Silt Fence

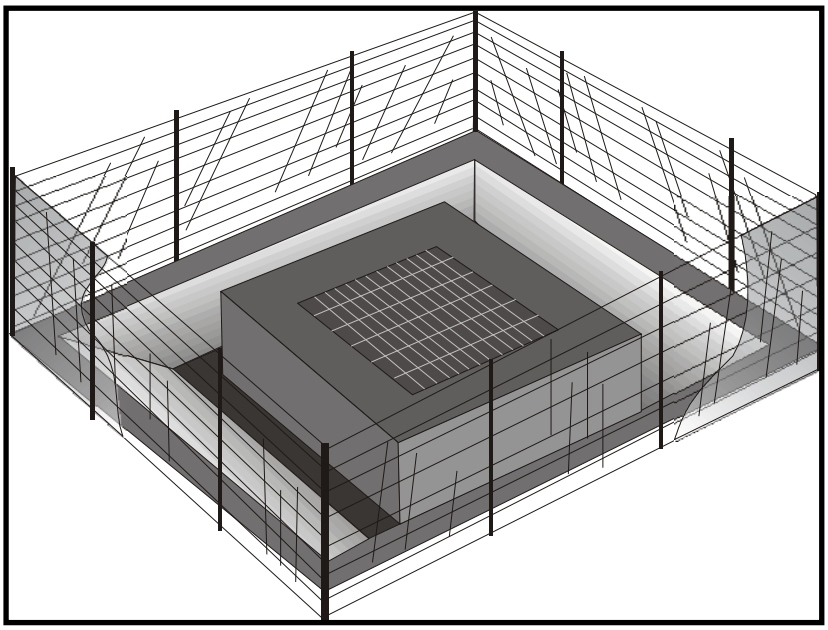
SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-12 Manufactured Linear Sediment Controls

SE-14 Biofilter Bags

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

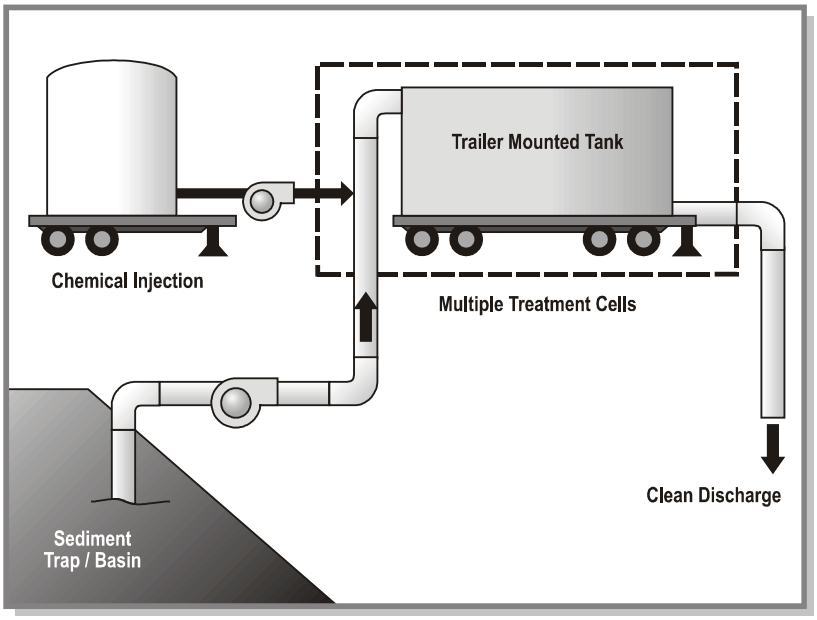
SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-14 Biofilter Bags

SE-13 Compost Socks and Berms

Active Treatment Systems SE-11



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

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.

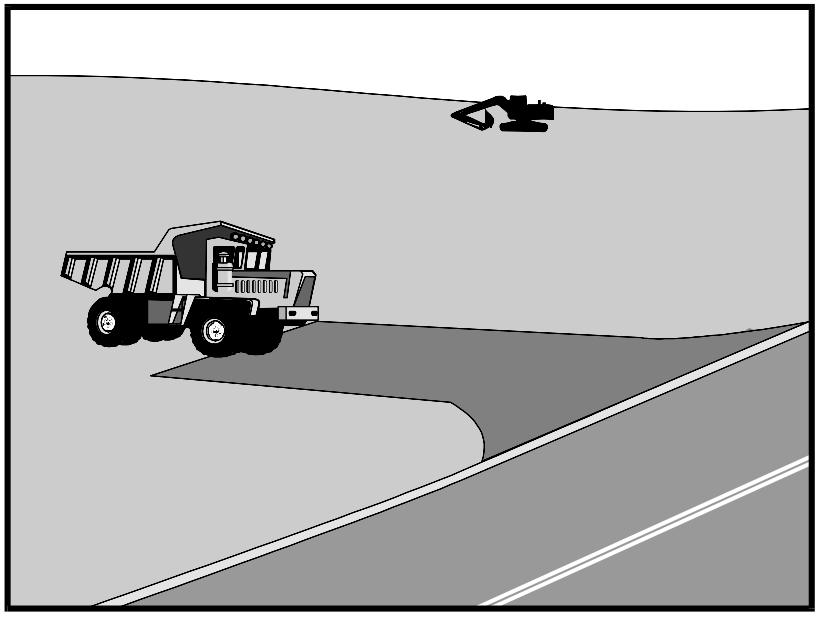
Suitable Applications

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	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

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

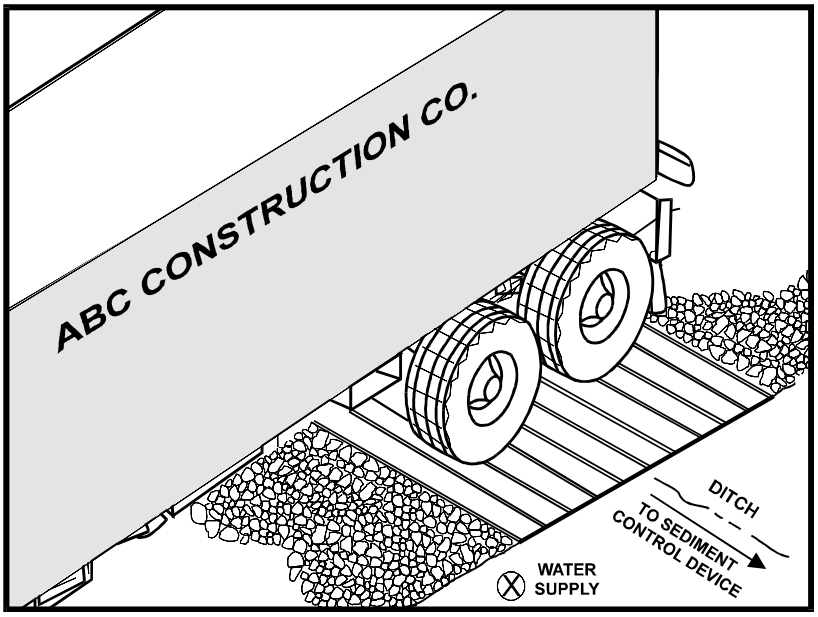
- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct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

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

Potential Alternatives

None

Entrance/Outlet Tire Wash TC-3



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.

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**

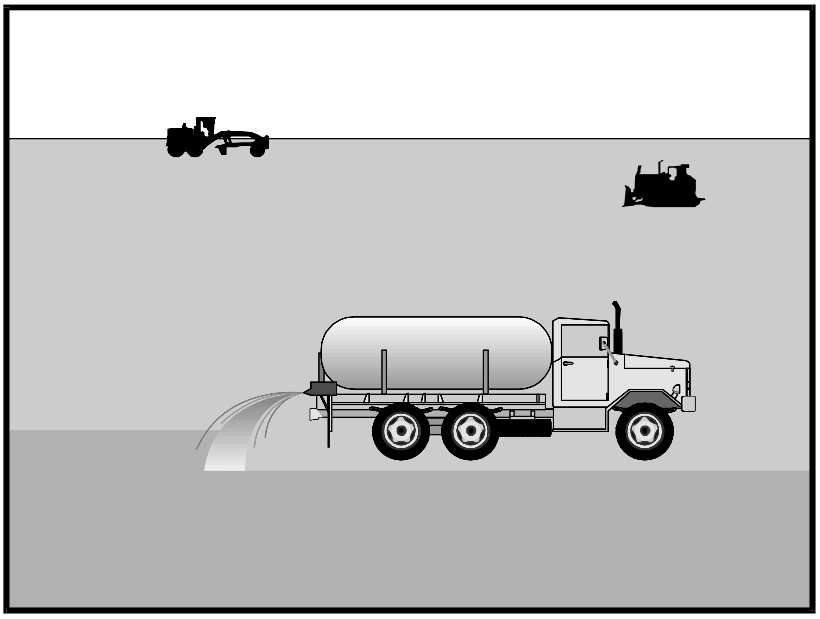
Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

TC-1 Stabilized Construction Entrance/Exit

Wind Erosion Control WE-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

EC-5 Soil Binders

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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:

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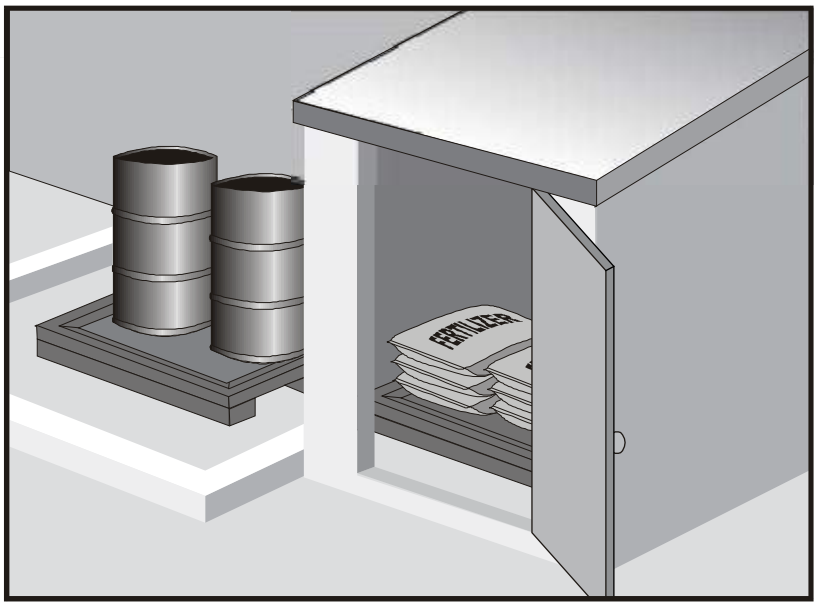
Material Delivery and Storage WM-1



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**

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:

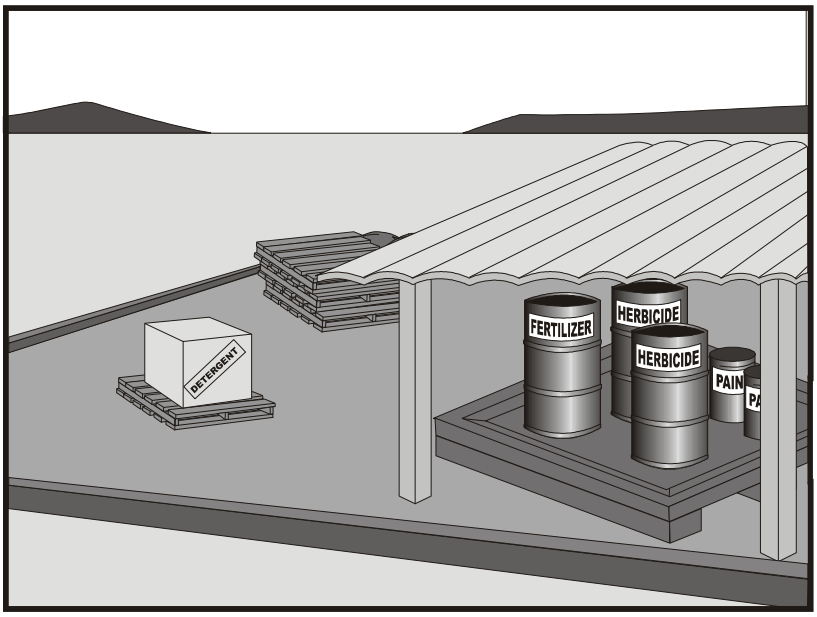
- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease

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

Potential Alternatives

None

Material Use WM-2



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**

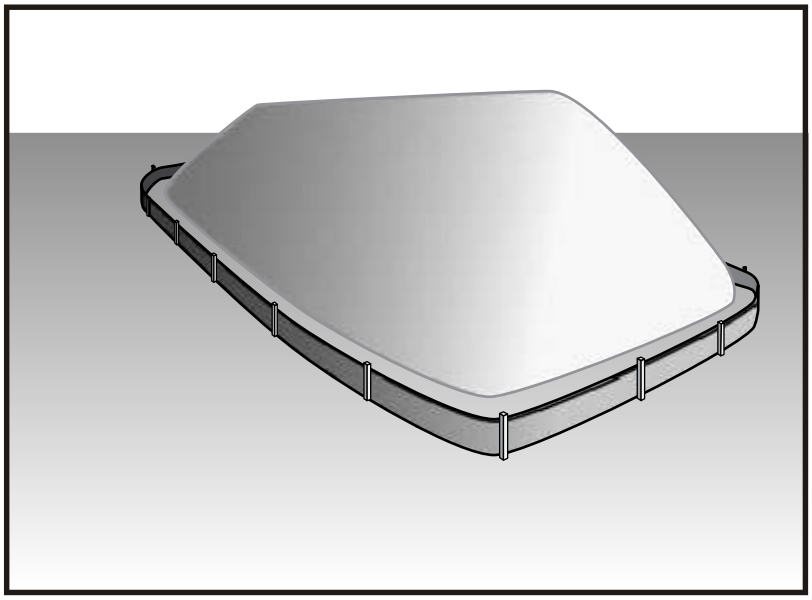
Targeted Constituents

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

Potential Alternatives

None

Stockpile Management WM-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 Category**
☒ **Secondary Category**

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

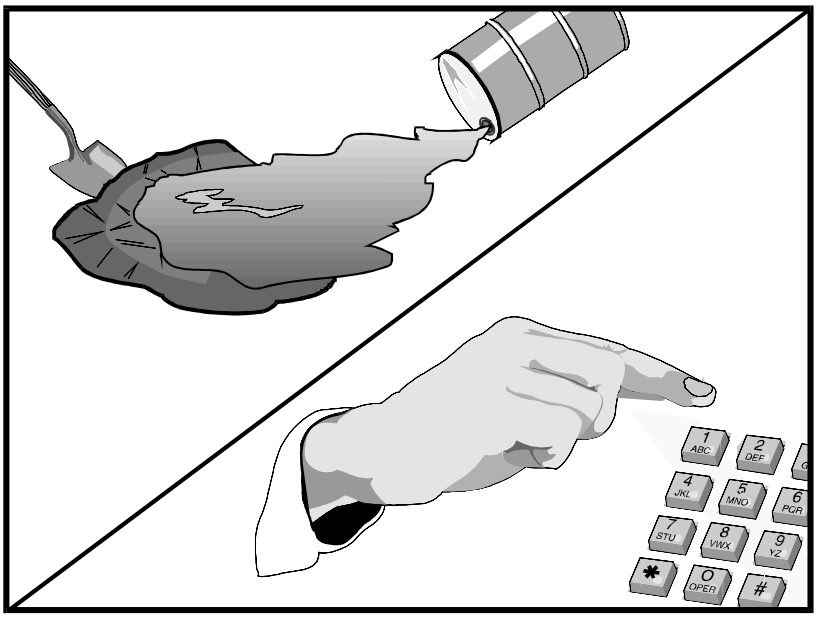
Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

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

Potential Alternatives

None

Spill Prevention and Control WM-4



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

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**

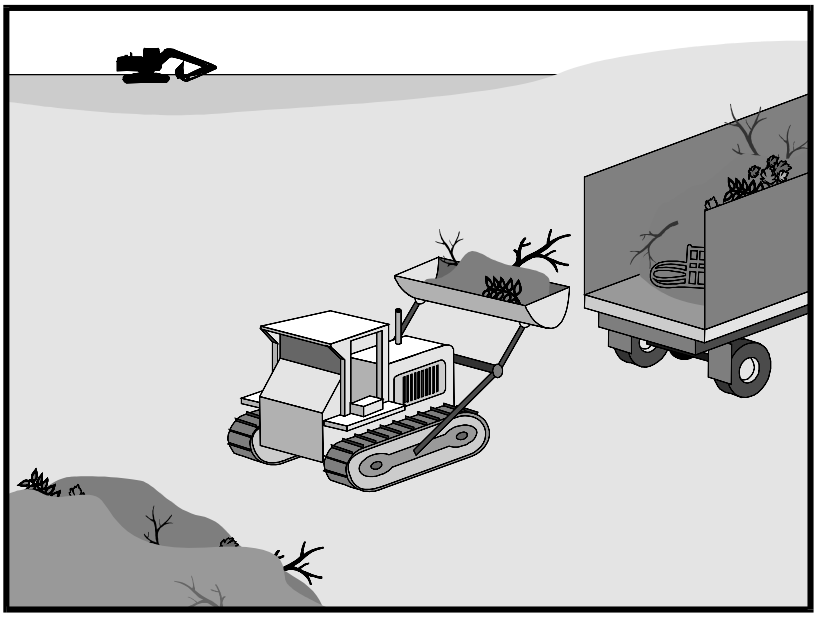
Targeted Constituents

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

Potential Alternatives

None

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

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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.

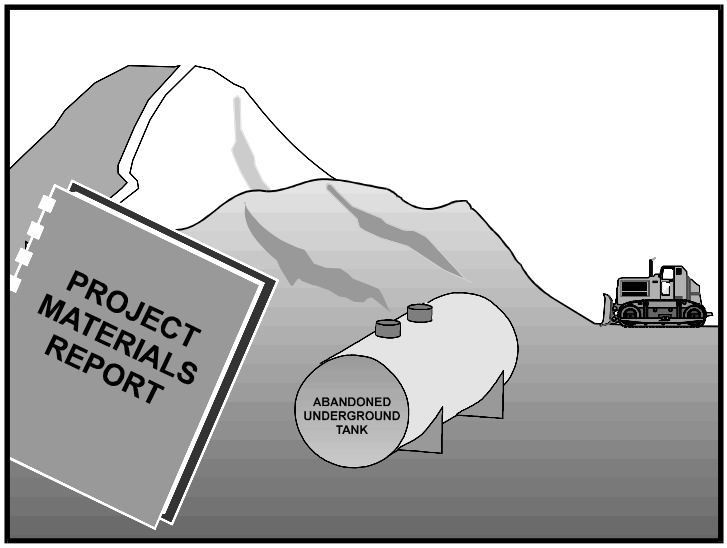
Suitable Applications

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

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

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**

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

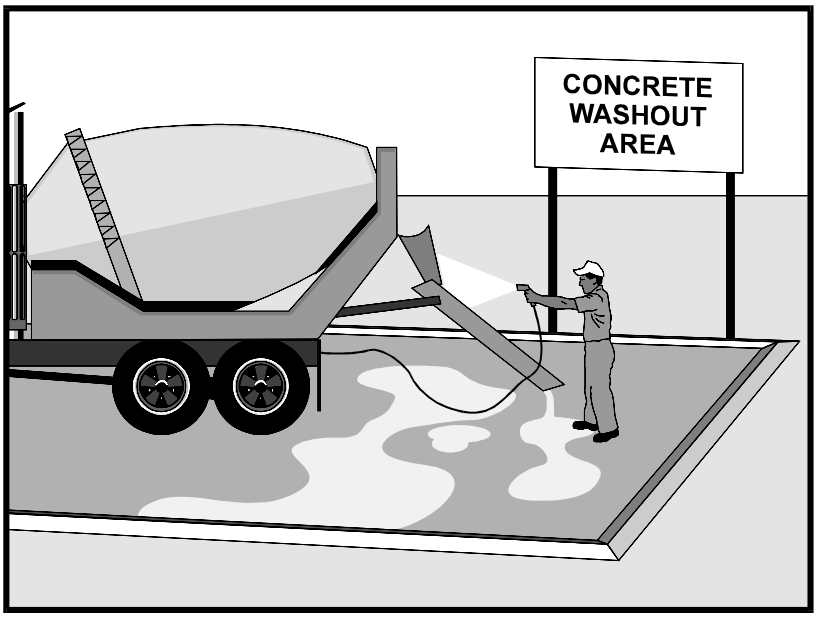
Targeted Constituents	
Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Concrete Waste Management WM-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

None

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).

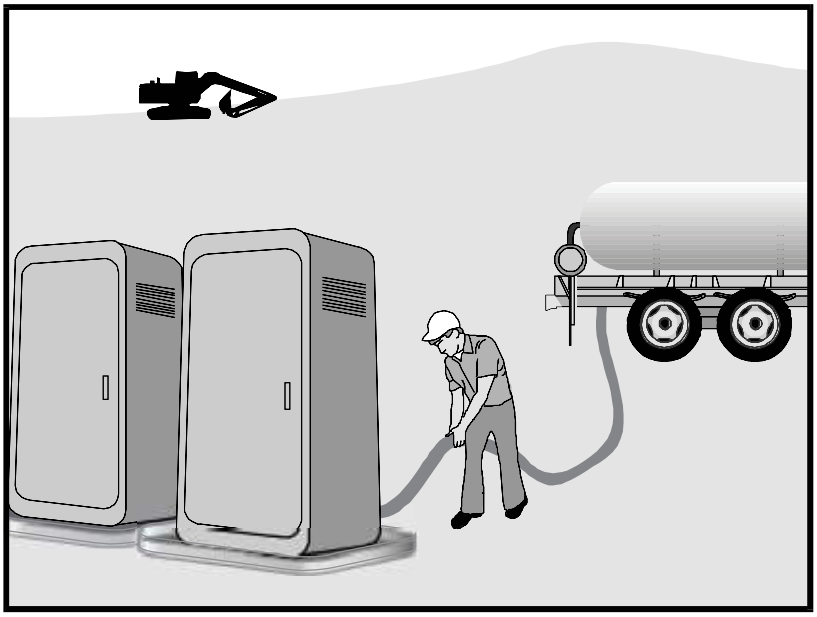
Many types of construction materials, including mortar, concrete, stucco, cement and block and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into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

Sanitary/Septic Waste Management WM-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 Category**
☒ **Secondary Category**

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

Potential Alternatives

None

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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.

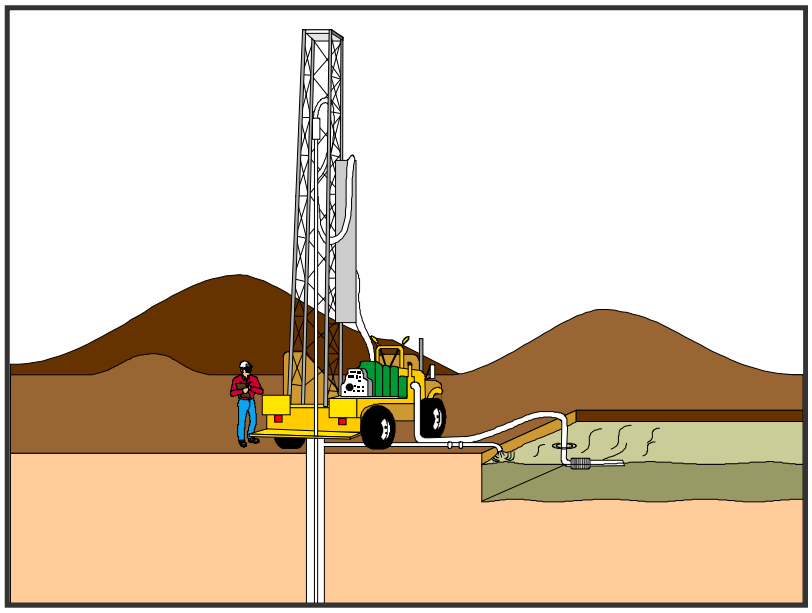
Implementation

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.

Liquid Waste Management WM-10



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

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