VERMONT CORRIDOR DEVELOPMENT PROJECT

WATER RESOURCES CONCEPTUAL REPORT
OCTOBER 25, 2017

PREPARED BY:
KPFF Consulting Engineers
700 South Flower Street, Suite 2100
Los Angeles, CA 90017
(213) 418-0201
Table of Contents

1. INTRODUCTION ........................................................................................................................ 1
   1.1. PROJECT DESCRIPTION ........................................................................................................ 1
   1.2. SCOPE OF WORK .................................................................................................................. 3

2. SURFACE WATER HYDROLOGY .................................................................................................. 3
   2.1. REGULATORY FRAMEWORK ............................................................................................ 3
   2.2. ENVIRONMENTAL SETTING ............................................................................................. 4
   2.3. SIGNIFICANCE THRESHOLDS ........................................................................................... 6
   2.4. METHODOLOGY .................................................................................................................. 7
   2.5. PROJECT IMPACT ANALYSIS ............................................................................................ 8
      2.5.1. CONSTRUCTION ......................................................................................................... 8
      2.5.2. OPERATION ................................................................................................................. 9
      2.5.3. CUMULATIVE IMPACT ANALYSIS ........................................................................... 10

3. SURFACE WATER QUALITY ...................................................................................................... 11
   3.1. REGULATORY FRAMEWORK ........................................................................................... 11
   3.2. ENVIRONMENTAL SETTING ........................................................................................... 17
   3.3. SIGNIFICANCE THRESHOLDS ........................................................................................... 18
   3.4. METHODOLOGY ................................................................................................................ 18
   3.5. PROJECT IMPACT ANALYSIS ........................................................................................... 22
      3.5.1. CONSTRUCTION ......................................................................................................... 22
      3.5.2. OPERATION ................................................................................................................. 23
      3.5.3. CUMULATIVE IMPACT ANALYSIS ........................................................................... 25

4. GROUNDWATER .......................................................................................................................... 25
   4.1. REGULATORY FRAMEWORK ........................................................................................... 25
   4.2. ENVIRONMENTAL SETTING ........................................................................................... 27
   4.3. SIGNIFICANCE THRESHOLDS ........................................................................................... 30
   4.4. METHODOLOGY ................................................................................................................ 31
   4.5. PROJECT IMPACT ANALYSIS ........................................................................................... 31
      4.5.1. CONSTRUCTION ......................................................................................................... 31
      4.5.2. OPERATION ................................................................................................................. 33
      4.5.3. CUMULATIVE IMPACT ANALYSIS ........................................................................... 34

5. LEVEL OF SIGNIFICANCE ........................................................................................................ 35
Appendix

Figure 1 - Existing Drainage Patterns
Figure 2 - Proposed Drainage Patterns
Figure 3 - Existing Hydrology Calculations
Figure 4 - Proposed Hydrology Calculations
Figure 5 - LA County Hydrology Map
Figure 6 - Ballona Creek Watershed Map
Figure 7 - FEMA Floodplain Map
Figure 8 - Dam Inundation Map
Figure 9 - Groundwater Basin Map
Figure 10 - Typical SWPPP BMPs
Figure 11 - LID Calculations
Figure 12 - Conceptual Site Plans
1. INTRODUCTION

1.1. PROJECT DESCRIPTION

The Project proposes the redevelopment of each of the three Project Sites. Specific development that is proposed for each Site is described below.

**Site 1**

Proposed development on Site 1 would involve removal of the existing DPR office building, vacant office building, surface parking lots, and parking structure, and construction of a new County office building containing 471,000 square feet of office use and 10,000 square feet of ground floor retail over a 390,000 square foot parking structure containing 965 spaces. The proposed office building would be up to 280 feet in height to the top of the parapet (286 feet to top of elevator machine room, 296 feet to top of emergency helistop), and would consist of 21 total stories (13 office floors over an eight-story parking structure (seven levels above grade and one level at grade)). In addition, a new parking structure would be constructed on the site of the existing 7-story parking structure on Shatto Place. This new structure would contain 768 spaces within a 380,000 square foot, eleven-story building with two below grade levels that would serve the new office building. The new parking structure would be up to 110 feet in height to the top of the parapet (130 feet to top of elevator machine room). A total of 134 bicycle storage spaces (6 short-term and 128 long-term) would be provided on Site 1.

When complete, the new 21-story office building would accommodate the relocation of the 973 DMH employees currently located within the existing 12-story building on Site 2, the 250 CSS employees currently located within the existing four-story building on Site 2, and an additional 840 DMH employees currently located in leased facilities within four miles of the new office building. Accordingly, a total of up to 2,063 County employees would be located on Site 1 when the building opens in 2021.

In order to provide the capability to meet the County’s future needs, the new Site 1 office building would be designed to accommodate future growth, to a maximum of 2,166 employees, between 2021 and 2023.

Vehicular and pedestrian access to the new Site 1 office building would be provided from Vermont Avenue. Two driveways located immediately north and south of the proposed new building, would lead to the parking levels. Ingress would be provided from the south driveway, and egress would be provided from the north driveway. Retail uses and a lobby to access the office levels would be provided on Vermont Avenue. The principal entrance to the new office building would be provided on the east side of the building via a terraced connection to the top level of the proposed new Shatto Place parking structure. The terrace entrance would connect to an atrium that would provide security and access to the office floors above. Access to the new Shatto Place parking structure would be
from two driveways on Shatto Place. Ingress and egress would be provided from both the north driveway and south driveways.

**Site 2**

Proposed development on Site 2 would involve reuse and conversion of the existing 154,793 square foot, 12-story DMH building into a maximum of 172 residential units (82 studio, 46 one-bedroom, 44 two-bedroom), 4,100 square feet of ground floor retail, 1,375 square feet of ancillary space (office, common area, etc.), and an approximately 7,500 square foot roof deck amenity. Upgrade to existing steel framing and installation of new HVAC, and life/safety systems would be included in the reuse of the existing DMH building. The existing building height of 173.5 feet (including the elevator machine room) would not change under the Project. In addition, the development of Site 2 would involve removal of the existing four-story, approximately 52,000 square foot, CSS office building and two-story parking structure, and construction of a new 116,324 square foot, five-level parking structure (3.5 levels above grade and 1.5 levels below grade). A future option for the development of Site 2 would include construction of a new 66,935 square foot, mixed-use building above the parking structure, containing five residential levels and 74 units (28 studio, 38 one-bedroom, and 8 two-bedroom), and 2,250 square feet of ancillary space. In addition, 3,400 square feet of retail uses would be provided at the ground level of the new mixed-use building on 6th Street. The parking structure would provide 263 auto parking spaces and 290 bicycle storage spaces (30 short-term and 260 long-term) to serve the residential units (new and reused/converted), and the retail uses on Site 2. The new mixed-use building would be approximately 95 feet from the highest adjacent grade to the top of the parapet (105 feet to top of elevator machine room).

Retail uses on Site 2 would be located along Vermont Avenue and 6th Street. The residential units on Site 2 would be accessed from a lobby facing Vermont Avenue, with secondary access from a new plaza area that would front on 6th Street. The existing repurposed building would be connected to the new mixed-use building via a sky bridge on the 4th floor. Ingress and egress to the new parking structure would be provided from 6th Street. The new residential units would be accessed directly from the parking garage, while the converted units in the existing building would connect to the new parking garage via the 4th floor sky bridge. Construction of Site 2 will not commence until the completion of the Site 1 development, and relocation of the 973 DMH employees currently located in the existing DMH building on Site 2, and the 250 CSS employees currently located on Site 2 into the new Site 1 building would be required prior to the construction of the proposed mixed-use building. Buildout of Site 2 is expected by 2023.

**Site 3**

Proposed development on Site 3 would involve removal of the existing DPR building, and construction of a new 80,837 square foot, six-story, one hundred percent senior affordable and special needs housing (for homeless adults) project containing 72 units (36 Very Low Income units, 24 Low Income units, 11 Moderate Income units, and one
manager’s unit), and a 13,200 square foot Community Center, over a three-story, 51,591 square foot underground parking structure containing 116 spaces. The entrance to the proposed Community Center would be provided on Vermont Avenue. A separate entrance to the proposed residential units, and vehicular access to the below ground parking structure that would serve the residential and Community Center uses would be also provided from Vermont Avenue. In addition, 81 long term and 21 short-term bicycle parking spaces would be provided on the ground floor. A landscaped courtyard, open to the sky, would be provided on the second level of the Project to serve the Project residents, and would be surrounded by the upper floor units. The new building would be 65 feet in height to the top of the parapet (75 feet to top of elevator machine room).

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. Surface Water Hydrology

2.1. Regulatory Framework

County of Los Angeles Hydrology Manual

Per the City of Los Angeles (City)'s Special Order No. 007-1299, December 3, 1999, the City has adopted the Los Angeles County (County) Department of Public Works Hydrology Manual as its basis of design for storm drainage facilities. The 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 (Q) for direct connections to Flood Control facilities. The determination of the allowable Q is based on the infrastructure capacity directly impacted by the service area. 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

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. ENVIRONMENTAL SETTING

2.2.1. REGIONAL

The Project Site is located in the greater Los Angeles area within the Ballona Creek Watershed. Ballona Creek is a 9 mile long flood protection channel that drains the Los Angeles basin, from the Santa Monica Mountains to the north, the Harbor Freeway (I-110/SR-110) to the east, and Baldwin Hills to the south. The Ballona Creek Watershed totals approximately 130 square miles. The Watershed borders the Santa Monica Mountains, the Ventura-Los Angeles County line, and extends to downtown Los Angeles. The Watershed also extends to the south across the Los Angeles plain to include the area north of Baldwin Hills. The major tributaries to the Ballona Creek include Centinela Creek, Sepulveda Canyon Channel, Benedict Canyon Channel, and numerous storm drains. Refer to Figure 6 for Ballona Creek Watershed Map.

2.2.2. LOCAL

Sites 1, 2, and 3 (the Project) will discharge into a City of Los Angeles 18” underground storm drain pipe located along Vermont Avenue. In addition, a portion of Site 1 will discharge toward Shatto Place which drains north into another 18” underground storm drain pipe located along 4th Street. Stormwater that leaves the sites will surface drain into gutters along Vermont Avenue and Shatto Place where it will flow north toward the nearest catch basins. In general, Stormwater runoff will enter offsite catch basins and underground storm drainage pipes which convey stormwater through underground pipe networks eventually draining into Ballona Creek. Ballona Creek flows generally southwest, ultimately discharging into the Pacific Ocean at the Santa Monica Bay. Ballona Creek is designed to discharge to Santa Monica Bay approximately 71,400 cubic feet per second from a 50-year frequency storm event. The existing stormwater infrastructure located along Vermont Avenue and Shatto Place have sufficient capacity to accept the stormwater runoff demands from the existing project site.
2.2.3. **On Site**

As described above, Site 1 consists of an existing two-story office building, a one-story office with rooftop parking, two surface parking lots, and a parking structure. Site 2 consists of an existing 12-story building, a four-story building, and a parking structure. Site 3 consists of a 4-story building and surface parking lot.

The existing Site 1 buildings along Vermont Avenue drains directly to the curb face. The existing surface parking lot sheet flows to the gutter in the street. Just north of Site 1 is a City owned catch basin where stormwater is collected and piped to an 18-inch storm drain main along Vermont Avenue. The existing parking structure on Shatto Place to collects stormwater from the roof and discharges to the curb face through multiple rectangular curb drains.

Site 2 is located at the corner of 6th Street and Vermont Avenue. The existing structures for Site 2 discharges directly to curb face along Vermont Avenue and 6th Street. Runoff from the Project Site sheet flows to the same catch basin as Site 1.

Site 3 is located North of Site 1 and Site 2 on Vermont Avenue. The existing building discharges directly to the curb face. Runoff from the Project Site sheet flows north to a catch basin near 4th Street.

Refer to Figure 1 for existing drainage patterns.

As shown in Table 1, the Project Site has been analyzed as four separate drainage areas. Existing runoff was analyzed for a 50-year storm event.

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>Area (Acres)</th>
<th>Q50 (cfs)</th>
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</thead>
<tbody>
<tr>
<td>Site 1 – Vermont Avenue</td>
<td>1.737</td>
<td>5.41</td>
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<tr>
<td>Site 1 – Shatto Place</td>
<td>.797</td>
<td>2.48</td>
</tr>
<tr>
<td>Site 2</td>
<td>.994</td>
<td>3.10</td>
</tr>
<tr>
<td>Site 3</td>
<td>.498</td>
<td>1.55</td>
</tr>
</tbody>
</table>

Existing catch basins and stormwater infrastructure located along 4th Street, 6th Street, Vermont Avenue, and Shatto Place, have sufficient capacity to accept the stormwater runoff from the existing site.
2.3. **Significance Thresholds**

With respect to surface water hydrology, the California Environmental Quality Act (CEQA) Guidelines inquire whether the Project would:

- 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 result in substantial erosion or siltation on- or off-site;
- 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 result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as result of the failure of levee or dam;
- Would the project result in the construction of new water or wastewater treatment facilities, the construction of which could cause significant environmental effects?
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.
2.4. METHODOLOGY

The Project is located in the Koreatown area under the jurisdiction of both the Los Angeles County Department of Public Works (“LACDPW”, or the “County”) Flood Control Division, and the City of Los Angeles Department of Public Works Bureau of Engineering (the “City”). Drainage collection, treatment and conveyance are regulated by the County and the City. As discussed above, the County utilizes its Hydrology Manual as its basis of design for storm drainage facilities. Per the City’s Special Order No. 007-1299, December 3, 1999, the City has also adopted the Hydrology Manual as its basis of design for storm drainage facilities. The Hydrology Manual requires drainage facilities to meet the Urban Flood level of protection. The Urban Flood is defined as stormwater 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. However, the City’s CEQA Threshold Guide establishes the 50-year frequency design storm event as the threshold to analyze potential impacts on surface water hydrology due to development. This is in part because the City of Los Angeles uses the 50-year storm event to design new stormwater drainage systems. Therefore, the 50-year frequency design storm event in this analysis is consistent with the CEQA threshold to determine if the project “[exceeds] the capacity of existing or planned stormwater drainage systems or provide[s] additional sources of polluted runoff.”

Modified Rational Method was used to calculate stormwater runoff. The “peak” (maximum value) runoff for a drainage area is calculated using the formula, \( Q = CIA \)

Where,

\[ Q = \text{Volumetric flow rate (cfs)} \]
\[ C = \text{Runoff coefficient (dimensionless)} \]
\[ I = \text{Rainfall Intensity at a given point in time (in/hr)} \]
\[ A = \text{Basin area (acres)} \]

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 stormwater peak runoff flow rate for the Project conditions by evaluating an individual sub-area independent of all adjacent subareas. See Figures 3 and 4 for Hydrology Calculations and Figure 5 for LA County Hydrology Data Map.

2.5. PROJECT IMPACT ANALYSIS

2.5.1. CONSTRUCTION

Construction activities for the Project would include demolition of the existing buildings on Sites 1 and 3, demolition of one building on Site 2, and site work, excavation for subterranean levels, building up the structures, and hardscape and landscape around the structures. These activities have potential to temporarily alter existing drainage patterns and flows on each of the sites by exposing the underlying soils, modifying flow direction, and making the each site temporarily more permeable. Also, exposed and stockpiled soils could be subject to erosion and conveyance into nearby storm drains during storm events. In addition, on-site watering activities to reduce airborne dust could contribute to pollutant loading in runoff.

However, as the Project would be greater than one acre, the Project would be required to obtain coverage under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit. In accordance with the requirements of this permit, the Project would implement a Storm Water Pollution Prevention Plan (SWPPP) that specifies Best Management Practices (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 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 would be required to comply with all applicable Los Angeles County grading permit regulations that require necessary measures, plans, and inspections to reduce sedimentation and erosion. Thus, through compliance with all NPDES Construction General Permit requirements, including preparation of a SWPPP, implementation of BMPs, and compliance with applicable Los Angeles County grading regulations, the Project would not substantially alter the drainage patterns in a manner that would result in substantial erosion, siltation, flooding on- or off-site. Similarly, adherence to standard compliance measurements in construction activities would not cause flooding, substantially increase or decrease the amount of surface water flow from the Project into a water body, or 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.
2.5.2. Operation

The percentage of impervious surface for Site 1, Site 2 and Site 3 will decrease slightly. The existing sites are approximately 100% impervious surface areas which includes buildings and hardscape surfaces. Existing stormwater discharges from the Project without treatment or detention. The Project will develop buildings across three sites and it is anticipated that the new overall Project impervious area will be reduced to approximately 95%. This reduction is due to the addition of landscaping areas.

As noted above and described in further detail in Section 3 Surface Water Quality, below, the Project will add landscaping and implement a stormwater mitigation strategy to collect the first flush of runoff from building roofs and hardscape areas. Therefore, the anticipated volume of stormwater runoff from the existing condition would decrease, but not measurably in the 50-year storm event scenario. The post-project condition will manage stormwater flow via roof drains, area drains, and pipes to discharge points and existing catch basins located on the adjacent public streets. Table 2 below shows the existing 50-year frequency design storm event peak flow rate and the proposed 50-year frequency design storm event peak flow rate. A comparison of the pre and post peak flow rates indicates that stormwater runoff would not increase after completion of the Project. Consequently, 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.

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>Area (Acres)</th>
<th>Pre-Project Q₅₀ (cfs)</th>
<th>Post-Project Q₅₀ (cfs)</th>
<th>Incremental Increase Existing to Proposed</th>
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<tr>
<td>Site 1 – Vermont Avenue</td>
<td>1.737</td>
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<tr>
<td>Site 1 – Shatto Place</td>
<td>.797</td>
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<tr>
<td>Site 2</td>
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<td>0</td>
</tr>
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<td>Site 3</td>
<td>.498</td>
<td>1.6</td>
<td>1.6</td>
<td>0</td>
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</tbody>
</table>
The Project is not located within a 100-year flood plain as shown on Figure 7 or within an area that could be impacted by a tsunami as shown on Figure 8. A seiche is a temporary disturbance or oscillation in the water level of a partially enclosed body of water caused by either seismic or atmospheric disturbance. Hazards include overtopping of the enclosing structures/geology and flooding of the surrounding area, with large topographically high bodies of water posing the greatest risk. Large bodies of uncovered water such as reservoirs, lakes or ponds are not located up gradient, or in the vicinity of the Project. Thus, hazards related to seiches are considered remote to the Project Site.

The Project is not located within areas designated by the state geologist where previous occurrence of landslide movement or local topographic, geological, geotechnical and subsurface conditions indicate a potential for permanent ground displacement to the extent that mitigation would be required. The potential for slope stability hazards (i.e. mudflows) at the Project Site is negligible.

Therefore, impacts related to the above potential issues are less than significant.

The Project is within the potential inundation area of the Hollywood Reservoir according to the City of Los Angeles General Plan Safety Element, Exhibit G: Inundation & Tsunami Hazard Areas as shown on Figure 8. Dam safety regulations are the primary means of reducing damage or injury due to inundation occurring from dam failure. The California Division of Safety of Dams regulates the siting, design, construction, and periodic review of all dams in the State. In addition, dams and reservoirs are monitored during storms and measures are instituted in the event of potential overflow. These measures include seismic retrofits and other related dam improvements completed under the requirements of the 1972 State Dam Safety Act. Further, in the event of a dam failure at the Hollywood Reservoir, existing urban development north of the Project, including the US 101 Freeway, would serve as a physical barrier between the upstream portion of the reservoirs/dams and the Project Site. Therefore, the risk of flooding from inundation by dam failure is considered low and impacts are less than significant.

2.5.3. **Cumulative Impact Analysis**

The geographic context for the cumulative impact analysis on surface water hydrology is the Ballona Creek Watershed. The Project in conjunction with forecasted growth in the Ballona Creek Watershed could cumulatively increase stormwater runoff flows. However, as noted above, the Project would not increase stormwater flows. Also, in accordance with City and County of Los Angeles requirements, related projects and other future development projects would be required to implement BMPs to manage stormwater in accordance with LID guidelines, which would hold steady or decrease flows to the storm drain system. Furthermore, the City of Los Angeles Department of Public Works would review each future development project 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 Project on surface water hydrology would be less than significant.
3. SURFACE WATER QUALITY

3.1. REGULATORY FRAMEWORK

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

Since its introduction, major amendments to the 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, (2) construction sites of one to five acres, 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.

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...
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

**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 CWA, including the authority to regulate waste disposal and require cleanup of discharges of hazardous materials and other pollutants.

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⁴ USEPA, U.S. Environmental Protection Agency - Clean Water Act, July 2011
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 Toxic Rule*

In 2000, the EPA promulgated the California Toxic 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 Toxic Rule establishes acute (i.e., short-term) and chronic (i.e., long-term) standards for bodies of water such as inland surface waters and enclosed bays and estuaries that are designated by the LA RWQCB 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 California Water Code, the LA RWQCB 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 ground waters, 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 CWA to control the discharge of pollutants from any point source into the waters of the United States. As indicated above, in California, the NPDES stormwater permitting program is administered by the SWRCB through its nine RWQCBs.

The Construction General Permit

SWRCB Order No. 2012-0006-DWQ known as “The Construction General Permit” was adopted on July 7, 2012. This NPDES permit establishes a risk-based approach to stormwater control requirements for construction projects by identifying three project risk levels. The main objectives of the General Permit are to:

1. Reduce erosion
2. Minimize or eliminate sediment in stormwater discharges
3. Prevent materials used at a construction site from contacting stormwater
4. Implement a sampling and analysis program
5. Eliminate unauthorized non-stormwater discharges from construction sites
6. Implement appropriate measures to reduce potential impacts on waterways both during and after construction of projects
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 for a specific construction project, charging Owners with stormwater quality management

responsibilities. A construction site subject to the General Permit must prepare and implement a SWPPP that meets the requirements of the General Permit.\(^6\) \(^7\)

*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 LA RWQCB 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. The Permittees are the 84 Los Angeles County cities (including the City of Los Angeles), Los Angeles County, and the Los Angeles County Flood Control District.

Among other recommendations and requirements, the MS4 Permit requires the co-permittees to, at a minimum, implement the Stormwater Quality Management Program (SQMP), which is an enforceable element of the Los Angeles County MS4 Permit. The SQMP, at a minimum, shall also comply with the applicable storm water program requirements of 40 CFR section 122.26(d)(2). The SQMP and its components shall be implemented so as to reduce the discharges of pollutants in storm water to the maximum extent practicable (MEP) and effectively prohibit non-storm water discharges to the MS4. Each Permittee shall also implement additional controls, where necessary, to reduce the discharge of pollutants from the MS4.\(^8\)

Los Angeles County meets these requirements through the LID Ordinance described below.

*Low Impact Development – LA County (LID) - FOR SITE 1 AND SITE 3*

In October 2008, the County adopted an LID Ordinance into the Los Angeles County Code Title 12, Chapter 84 to require the use of LID principles in all development projects


\(^7\) USEPA. U.S. Environmental Protection Agency - NPDES, July 2011 <http://cfpub.epa.gov/npdes/>.

\(^8\) California Regional Water Quality Control Board, Los Angeles Region. Attachment F – Fact Sheet for Order R4-2012-0175 (as amended by Order WQ 2015-0075 and Order R4-2012-0175-A01) NPDES Permit No. CAS004001, November 2012.
except road and flood infrastructure projects. With the 2012 MS4 Permit, it became necessary for the County to modify this ordinance to reflect the new stormwater runoff water quality and hydromodification requirements for new development and redevelopment projects. In November 2013, the County amended the Los Angeles County Code Title 12, Chapter 84 to incorporate the requirements of the 2012 MS4 Permit. The November 2013 LID Ordinance became effective December 5, 2013, and requires that all Designated, Non-Designated, street and road construction, and single family hillside home projects comply with Los Angeles County Code Title 12, Chapter 84. The 2014 LID Standards Manual was prepared to complement and be consistent with the November 2013 LID Ordinance requirements.

Ultimately, a project applicant must submit a comprehensive LID Plan and analysis demonstrating compliance with the LID Standards Manual (which also constitutes compliance with the November 2013 LID Ordinance) for review and approval by the Director of Public Works.  

In October 2011, the City of Los Angeles passed an ordinance (Ordinance No. 181899) amending City of Los Angeles Municipal Code Chapter VI, Article 4.4, Sections 64.70.01 and 64.72 to expand the applicability of the existing 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.

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;

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• 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 Low Impact Development (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.

3.2. ENVIRONMENTAL SETTING

3.2.1. REGIONAL

As stated above, the Project lies within the Ballona Creek Watershed. Constituents of concern listed for Ballona Creek under California’s CWA Section 303(d) List include Cadmium (sediment), Chlordane (Tissue & Sediment), Coliform Bacteria, Copper (Dissolved), Cyanide, DDT, Exotic Vegetation, Habitat Alterations, Hydromodification, Lead, PAHs, PCBs, Reduced Tidal Flushing, Selenium, Sediment Toxicity, Shellfish Harvesting Advisory, Silver, Toxicity, Trash, Viruses (Enteric), and Zinc. ¹¹

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

3.2.3. **On Site**

It appears the existing Project does not implement structural BMPs and apparently has no means of treatment for stormwater runoff. As stated above, the Project drain into onsite storm drainage infrastructure that drains into City owned and maintained storm drainage infrastructure. Refer to Figure 1 for existing on-site drainage patterns.

Based on the existing operations within the Project, the on-site runoff likely contains the following pollutants of concern: sediment, nutrients, pesticides, metals, pathogens, and oil and grease.

3.3. **Significance Thresholds**

With respect to water quality, the CEQA Guidelines inquire whether the Project would:

- Violate any water quality standard or waste discharge requirements; or
- Otherwise substantially degrade water quality.

3.4. **Methodology**

3.4.1. **Construction**

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 and before any site clearing 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 are 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.

3.4.2. **Operation**

Site 1 and Site 3 are required to meet all applicable stormwater management requirements through compliance with the Los Angeles County LID Standards Manual, and Site 2 is required to meet all applicable stormwater management requirements through compliance with the City of Los Angeles LID Standards. LID standards are used to analyze the stormwater peak mitigated flow rate and volume. Both the City of Los Angeles and Los Angeles County LID standards require that projects select source control and treatment control BMPs from a priority list approved by the RWQCB. Both
the County and City prioritize the selection of BMPs used to comply with stormwater mitigation requirements as follows:

1. Infiltration Systems
2. Stormwater Capture and Use
3. High Efficient Bio filtration/Bio retention Systems
4. Combination of Any of the Above

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

The selected BMPs must control peak flow discharge to provide stream channel and over bank flood protection, based on LID flow design criteria. Furthermore, the source and treatment control BMPs will be sufficiently designed and constructed to collectively treat, infiltrate, capture and use, or filter stormwater runoff to meet or exceed the requirements of the LACDPW Watershed Division.

According to both City of Los Angeles and Los Angeles County LID Standards Manual, the design storm, from which the Stormwater Quality Design Volume (SWQDv) is calculated, is defined as the greater of:

- The 0.75-inch, 24-hour rain event; or
- The 85th percentile, 24-hour rain event as determined from the Los Angeles County 85th percentile precipitation isoheytal map.  

For Site 1 and Site 3, the County of Los Angeles method will be used to determine the volume of stormwater runoff that must be mitigated at a project site is calculated using the Modified Rational Method (MODRAT). MODRAT uses the design storm and a time of concentration to calculate the stormwater runoff at different times during a storm. By calculating the stormwater runoff flows based on the rainfall distribution, a hydrograph can be developed. The area under the hydrograph curve is the volume of stormwater runoff. The procedure for calculating the stormwater runoff using the MODRAT is an iterative process. LACDPW has developed a regression equation to calculate the time of concentration. The procedures for calculating the time of concentration and SWQDv using MODRAT is described below:

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12 The 85th percentile storm event (1.1 inches) is greater than the 0.75 inch storm event. Therefore, for the purposes of calculations, only the 85th percentile storm event was considered.

Step 1: Assume Initial Time of Concentration

Assume an initial time of concentration (tc).

Step 2: Calculate Rainfall Intensity

Calculate the rainfall intensity using the assumed initial time of concentration as the duration from the following equation:

\[ I_t = I_{1440} \times \left( \frac{1440}{t} \right)^{0.47} \]

Where:
- \( t \) = Duration = Assumed initial time of concentration [min];
- \( I_t \) = Rainfall intensity for the duration [in/hr];
- and \( I_{1440} \) = 24-hour rainfall intensity [in/hr].

Step 3: Calculate Impervious Area and Stormwater Runoff Coefficient

Determine the impervious area of the project site from the following equation or from Appendix D of the 2006 Hydrology Manual:

\[ \text{IMP} = \frac{\sum_{i=1}^{n} (\text{IMP}_i \times A_i)}{A_T} \]

Where:
- \( \text{IMP} \) = Project site-specific percent impervious;
- \( \text{IMP}_i \) = Impervious area, i;
- \( A_i \) = Area, i [ft\(^2\)]; and
- \( A_T \) = Total project site area [ft\(^2\)].

Determine the undeveloped stormwater runoff coefficient, \( C_u \), using the soil curve data from Appendix C and the rainfall intensity calculated in Step 2. Calculate the developed stormwater runoff coefficient using the following equation:

\[ C_d = (0.9 \times \text{IMP}) + (1.0 - \text{IMP}) \times C_u \]

Where:
- \( C_d \) = Developed project site stormwater runoff coefficient;
IMP = Site-specific percent impervious for project site; and
Cu = Undeveloped project site stormwater runoff coefficient.

**Step 4: Calculate the Time of Concentration (Tc)**

Calculate the time of concentration using the following equation:

$$T_c = \frac{0.31 \times L^{0.483}}{(C_d \times I_t)^{0.519} \times S^{0.135}}$$

Where:
- $T_c$ = Time of concentration [min];
- $L$ = Longest flow path length from watershed boundary to outlet [ft];
- $C_d$ = Developed project site stormwater runoff coefficient;
- $I_t$ = Rainfall intensity for the duration [in/hr]; and
- $S$ = Slope of longest flow path [ft./ft.].

**Step 5: Compare Initial Assumption with Tc**

If the calculated time of concentration (Step 4) is within 0.5 minutes of the assumed time of concentration (Step 1), then the value is sufficient. If the calculated and estimated times of concentration differ by more than 0.5 minutes, round the calculated time of concentration (Step 4) to the nearest minute and use that value as the assumed time of concentration (Step 1) and restart the calculation again from Step 2.

**Step 6: Calculate Peak Flow Rate**

Round the calculated time of concentration to the nearest minute and recalculate the rainfall intensity and developed project site stormwater runoff coefficient. Calculate the peak flow rate using the rational equation:

$$Q = \frac{C_d \times I \times A}{43,560}$$

Where:
- $Q$ = Peak flow rate [cfs];
- $C_d$ = Developed project site stormwater runoff coefficient;
- $I$ = Rainfall intensity [in/hr]; and
- $A$ = Project area [ft²].

**Step 7: Calculate SWQDv**
MODRAT relies on temporal rainfall distribution and the time of concentration to generate hydrographs. The steps for calculating stormwater runoff are presented in the 2006 Hydrology Manual. Manual calculations for generating hydrographs require a lot of time and careful organization. The calculations are ideally suited for a computer program, and have been included in the HydroCalc program discussed below. Use of this program is encouraged to reduce the time required to reach a solution.

**HydroCalc Program**

LACDPW developed a hydrologic calculator (HydroCalc), which is available at http://dpw.lacounty.gov/wrd/publication/. HydroCalc completes the full MODRAT calculation process and produces the peak stormwater runoff flow rates and volumes for single subareas. Because HydroCalc does not have reach routing capabilities, it is limited to watersheds and project areas up to 40 acres.

For Site 2 the City of Los Angeles method will be used to determine the volume of stormwater runoff that must be mitigated at a project site. Below is the calculation for determining the mitigated volume.

**Calculation for the Design Volume**

The design capture volume ($V_{design}$) is based on the larger runoff produced from a 0.75-inch (0.0625 ft) storm event, or the 85th percentile storm event.

$$V_{design} \text{ (cu ft)} = 0.0625 \text{ (or 85th percentile) (ft)} \times \text{Catchment Area (sq ft)}$$

Where:

$$\text{Catchment Area} = (\text{Impervious Area} \times 0.9) + (\text{Pervious Area} \times 0.1)$$

3.5. **PROJECT IMPACT ANALYSIS**

3.5.1. **CONSTRUCTION**

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 Construction General Permit. In accordance with the requirements of the permit, the Project Applicants 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 Figure 10 for typical SWPPP BMPs to be implemented during construction of the Project.
As discussed below, the Project is expected to require dewatering during construction. Dewatering operations are practices that discharge non-stormwater, such as ground water, 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 pumps and filtration would be utilized in compliance with the NPDES permit. The temporary system would comply with all relevant NPDES requirements related to construction and discharges from dewatering operations.

Due to the presence of the abandoned oil wells within the Project, contaminated groundwater may be encountered when performing basement and foundation excavations. For dewatering at the Project, the groundwater will have to be chemically analyzed in order to determine the appropriate treatment and/or disposal methods.

With the implementation of site-specific BMPs included as part of the SWPPP, the Project would reduce or eliminate the discharge of potential pollutants from the stormwater runoff. In addition, the Project Applicant would be required to comply with County grading permit regulations, which require necessary measures, plans (including a wet weather erosion control plan if construction occurs during the rainy season), and inspection to reduce sedimentation and erosion. Therefore, with compliance with NPDES requirements, and County grading regulations, construction of the Project would not result in discharge that would violate any water quality standard or waste discharge requirements, or otherwise substantially degrade water quality. Furthermore, construction of the Project would not result in discharges that would cause regulatory standards to be violated in Ballona Creek. Therefore, temporary construction-related impacts on surface water quality would be less than significant.

### 3.5.2. Operation

The Project will not increase concentrations of the items listed as constituents of concern for the Ballona Creek Watershed.

Site 1 and Site 3 will implement BMPs for managing stormwater runoff in accordance with the current County LID Standards Manual. Site 2 will implement BMP’s for managing stormwater runoff in accordance with City of Los Angeles LID Standards.

Based on poor soils conditions mentioned in the geotechnical report\textsuperscript{14,15,16}, infiltration is deemed infeasible for the Project. Therefore capture and use would be the next priority level BMP to consider.

As shown in Figure 11, the estimated mitigated volume for Site 1 and Site 3 are 7,845 cubic feet (58,685 gallons) and 1,542 cubic feet (11,535 gallons), respectively. In order to satisfy the County requirements for capture and use for Site 1 and Site 3, the volume retained would be used within 96 hours after the rain event. If the County updates their Low Impact Design policy to allow for longer hold times, then capture and use would still be feasible, and the Project would consider longer holding durations.

The estimated mitigated volume for Site 2 is 3,078 cubic feet (23,212 gallons). In order to satisfy the City requirements for capture and use for Site 2, the volume retained would need to be emptied at least once during the 7-month rain season (October-April).

A cistern would be designed to hold the required volume, and the retained stormwater would be distributed to approved uses on the property such as cooling tower makeup, toilet flushing, or irrigation subject to Los Angeles County Health Department approval. There are multiple options for the system used to hold the collected stormwater. The two most common options include a waterproof cast in place concrete room (similar to a fire tank room), and a large diameter pipe.

Although dimensions for a waterproof room may vary, the tank for Site 1, Site 2 and Site 3 could be 10’x20’x40’, 10’x15’x21’, and 10’x11’x15’, respectfully. Additionally, there are multiple pipe sizes that can be used to store the collected stormwater, but assuming an 8-foot diameter pipe would result in approximately 156 linear feet of pipe for Site 1, approximately 62 linear feet of pipe for Site 2, and approximately 31 linear feet of pipe for Site 3.

Refer to Figure 12 for locations which have been identified as adequate to accommodate a cistern for Site 1, Site 2, and Site 3.

If it is determined that capture and use is not feasible, then the next priority level for both the County and City would be biofiltration. The estimated mitigated volume for Site 1, Site 2, and Site 3 are 11,773 cubic feet (88,028 gallons), 4,655 cubic feet (34,818 gallons), and 2,314 cubic feet (17,303 gallons), respectively. In order to satisfy both the County and City requirements, the mitigated volumes must be collected and piped to biofiltration planters before discharging to the public infrastructure.

The County’s requirement for biofiltration planters is that they are open bottom allowing for incidental infiltration. However, biofiltration planters can be located on structure if the plans are reviewed and approved by the State Water Resources Control Board. Based

\[\text{References}\]


on geotechnical recommendations for Site 1, open bottom biofiltration is infeasible. Therefore, Site 1 would be subject to review and approval from the State Water Resources Control Board. Additionally, Site 3 will require a closed bottom biofiltration planter due to the building limits extending to the property line. Therefore, Site 3 will also be subject to review and approval from the State Water Resources Control Board.

For Site 2, the City has no preference on whether the biofiltration planters are closed or open bottom.

As a result of implementing LID BMPs, there will be no operational impacts on surface water quality.

3.5.3. Cumulative Impact Analysis

Future growth in the Ballona Creek Watershed would be subject to NPDES requirements relating to water quality for both construction and operation. These requirements are implemented through the MS4 permit and LID regulations established by the permittees, including the County, and are designed to improve regional water quality over time. With application of these regulations to future new development in the urbanized area over time, future land use changes or development would not adversely affect regional surface water quality. As noted above, the Project does not have an adverse impact on water quality, and would improve the quality of on-site flows due to the introduction of new BMPs that would collect, treat, and discharge runoff from the Project Site (most of which is not treated before being discharged under existing conditions). Accordingly, through compliance with all applicable laws, rules and regulations, cumulative impacts to surface water quality would be less than significant.

4. GROUNDWATER

4.1. Regulatory Framework

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

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

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

4.2.1. GROUNDWATER LEVEL

4.2.1.1. REGIONAL

Groundwater use for domestic water supply is a beneficial use of groundwater basins in Los Angeles County. The central area of the City of Los Angeles, which includes the Project sites, overlies the Los Angeles Coastal Plain Groundwater Basin. The Los Angeles Coastal Plain Basin is comprised of the Hollywood, Santa Monica, Central, and West Coast Subbasins.

Groundwater flow in the Los Angeles Coastal Plain Groundwater 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 fresh water along specific seawater barriers to prevent the intrusion of salt water.

4.2.1.2. LOCAL

Within the Los Angeles Coastal Plain Groundwater Basin, the Project Sites specifically overlies the Central Subbasin (also referred to as “the Central Basin”). The Project Sites are located toward the western portion of the Central Basin. The Central Basin is bounded on the north by a surface divide called the La Brea high, and on the northeast and east by emergent less permeable Tertiary rocks of the Elysian, Repetto, Merced and Puente Hills. The southeast boundary between the Central Basin and Orange County Groundwater Basin roughly follows Coyote Creek, which is a regional drainage province boundary. The southwest boundary is formed by the Newport Inglewood fault system and the associated folded rocks of the Newport Inglewood uplift.17

Groundwater in the Central Basin is naturally replenished from surface inflow through Whittier Narrows. Percolation in the Los Angeles Forebay Area is restricted due to urbanization of the area. Imported and recycled water is also used for artificial recharge at the Rio Hondo and San Gabriel River spreading grounds. There are problems with saltwater intrusions in locations where river systems have eroded through the Newport

Inglewood uplift. The Central Basin “Allowed Pumping Allocation” (“APA”) was set at 217,367 acre-feet-per-year (AFY).  

Two LADWP facilities provide groundwater supplies in the Central Basin: the Manhattan Wells and the 99th Street Wells. The active Manhattan Wells were installed between 1928 and 1974, and have a production capacity of 16.9 cubic feet per second (cfs). Wells at the 99th Street location were installed between 1974 and 2002, and have a production capacity of 7.4 cfs. 

4.2.1.3. ON-SITE

The Project is developed with existing buildings and hardscape area with approximately 100% impervious surfaces. Due to the primarily impervious condition of the Project, there is minimal groundwater recharge potential in the existing condition. The discussion below is based on review of site specific geotechnical explorations conducted as part of Geotechnical Assessment(s) for Site 1, Site 2, and Site 3 conducted by Geotechnologies, Inc., dated November 2016, Revised August 15, 2017.

A previous investigation conducted near the subject site encountered groundwater at depths between 28 and 30 feet below grade. It is the opinion of Geotechnologies Inc. that the current groundwater level at the site should be anticipated to be similar to the water levels observed by the previous investigation. According to groundwater data provided in the Seismic Hazard Zone Report of the Hollywood 7 ½ - Minute Quadrangle, the historic-high groundwater level for the site was on the order of 20 feet below the ground surface (CDMG, 1998, Revised 2006). 

Fluctuation in the level of groundwater would be expected to occur over time due to variations in rainfall, temperature, and other factors. Fluctuations also may occur in the vicinity of the site. 

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As further described in the above mentioned Preliminary Geotechnical Assessment(s), bedrock of the Puente Formation was observed at depth ranging from between 28 and 46 feet below grade. Thus the groundwater observed is perched on top of the bedrock and comprises a distinct unit from those aquifers that comprise the Central Basin.

Furthermore there are no groundwater production wells or public water supply wells within one mile of the Project.\(^{23}\)

### 4.2.2. GROUNDWATER QUALITY

#### 4.2.2.1. 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 LA RWQCB. According to LA RWQCB’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.\(^{24}\)

#### 4.2.2.2. LOCAL

As stated above, the Project specifically overlies the Central Basin. Based upon LA RWQCB’s Basin Plan, constituents of concern listed for the Central Basin include Boron, Chloride, Sulfate, TDS, and Nitrate.\(^{24}\)

#### 4.2.2.3. ON-SITE

Though it is possible for surface water borne contaminants to percolate into groundwater and affect groundwater quality, as the Project is primarily impervious in the existing condition, no appreciable infiltration of potential contaminants described above is expected to occur. Additionally, the good housekeeping practices described above and compliance with all existing hazardous waste regulations further reduce this potential. Therefore, groundwater quality is not impacted by existing activities at the Project.

Other types of risk such as underground storage tanks have a greater potential to impact groundwater. Based upon the Draft Phase I Environmental Site Assessments (ESA)s

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performed by Tetra Tech dated November 30, 2016, there are no underground storage tanks at the Project.

Project Site 1, Site 2, and Site 3 are located within the Los Angeles City Oil/Gas Field. Several oil wells exist within Site 1 and Site 2, previously operated by Ruhland Oil Co. According to historical records from the California Division of Oil, Gas, and Geothermal Resources (CADOGGR) reviewed as part of the Phase I ESAs, the oil wells were drilled on-site in approximately 1890. The status of the wells is currently listed as buried. Nine oil wells are present within Site 1, three wells are present on Site 2, and no wells are present on Site 3. No additional information (such as construction details, production records, abandonment records) was found. Due to the presence of the oil wells with no abandonment documentation, petroleum impacted groundwater is expected beneath the Project Sites. Considering that no documentation is available regarding the abandonment of the oil wells, the oils wells would be required to go through current standards to ensure proper abandonment for the Project.

4.3. **SIGNIFICANCE THRESHOLDS**

4.3.1. **GROUNDWATER LEVEL**

With respect to groundwater level, the CEQA Guidelines inquire whether the Project would:

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or lowering of the local groundwater table;

4.3.2. **GROUNDWATER QUALITY**

With respect to groundwater quality, the CEQA Guidelines inquire whether the Project would:

- Violate any water quality standard or waste discharge requirements; or

- Otherwise substantially degrade water quality.

---

25 Phase I Environmental Site Assessment report titled “Commercial Property 510, 526, and 532 South Vermont Avenue and 523 Shatto Place, Los Angeles, California 90020 Project No. T36444”, by Tetra Tech, dated November 30, 2016.

26 Phase I Environmental Site Assessment report titled “Commercial Property 550 South Vermont Avenue and 3175 West 6th Street, Los Angeles, California 90020 Project No. T36444”, by Tetra Tech, dated November 30, 2016.

27 Phase I Environmental Site Assessment report titled “Commercial Property 433 South Vermont Avenue, Los Angeles, California 90020 Project No. T36444”, by Tetra Tech, dated November 30, 2016.
4.4. METHODOLOGY

4.4.1. GROUNDWATER LEVEL

The State’s CEQA Guidelines require a review of the Project, environmental setting, significance thresholds, and comparison with the screening criteria as stated above.

4.4.2. GROUNDWATER QUALITY

The State’s CEQA Guidelines require a review of the Project, environmental setting, significance thresholds, and comparison with the screening criteria as stated above.

4.5. PROJECT IMPACT ANALYSIS

4.5.1. CONSTRUCTION

4.5.1.1. GROUNDWATER LEVEL

The proposed high-rise office structure, proposed within Site 1, is anticipated to be built over eight story parking structure. In addition, a new twelve-story parking structure (ten levels above grade and two levels below grade) would be constructed. The depth of the subterranean levels is anticipated to be on the order of 20 feet in depth below the existing site grade. Considering the depth of the fill previously observed near the site, the structure will likely require foundation support from a deep foundation system, consisting of drilled cast-in-place friction piles.\(^{28}\)

The proposed mixed-use structure, proposed within Site 2, is anticipated to be built over 1.5 subterranean levels. The depth of the subterranean level is anticipated to be on the order of 20 feet in depth below the existing site grade. Due to the unknown depth of fill in Site 2, deep foundation support may be necessary.\(^{29}\)

The proposed structure, proposed within Site 3, is anticipated to be built over three subterranean parking levels. The depth of the subterranean level is anticipated to be on the order of 30 feet in depth below the existing site grade.\(^{30}\)

As stated above, the historic high groundwater level of 20 feet will be considered during designing the underground portion of the Project. Thus, due to the potential depth of the


construction activities and the historic high groundwater level, dewatering operations are expected and appropriate compliance and containment measures would be implemented to avoid impacts associated with potential groundwater discharges. Due to the operation of temporary dewatering systems local groundwater hydrology in the immediate vicinity of the Project is minimally affected. The purpose of dewatering operations is for the protection of both existing and proposed building structures. As the groundwater pumping is limited to the top 10-15 feet of the groundwater table (based on the historic high groundwater level) regional impacts to groundwater flow and level are not considered to be significant. Therefore, the Project would result in less than significant impacts related to groundwater level and would not substantially deplete groundwater supplies in a manner that would result in a net deficit in aquifer volume or lowering of the local groundwater table.

4.5.1.2. **GROUNDWATER QUALITY**

The Project does not include the installation or operation of water wells, or any extraction or recharge system that is in the vicinity of the coast, an area of known groundwater contamination or seawater intrusion, a municipal supply well or spreading ground facility. The Project does not include surface or subsurface application or introduction of potential contaminants or waste materials during construction or operation. The Project is not anticipated to result in releases or spills of contaminants that could reach a groundwater recharge area or spreading ground or otherwise reach groundwater through percolation. Therefore, the Project’s potential impact on groundwater quality is less than significant.

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. In addition, 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 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. Provided adherence to the appropriate compliance and containment measures, the Project would result in less than significant impacts related to groundwater quality.
4.5.2. Operation

4.5.2.1. Groundwater Level

Regarding groundwater recharge, the entire Project is primarily impervious in the existing condition. There is minimal groundwater recharge potential on the Project in the existing condition. The Project will develop hardscape and structures that cover the majority of the project footprint with impervious surfaces. Also, the pervious surfaces (such as landscaping) on the Project will drain into a controlled and managed drainage system that discharges into the storm drain system and not into the ground. Therefore, the Project’s potential impact on groundwater recharge is less than significant.

The subterranean levels of the Project are to be designed such that they are able to 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. Therefore the Project’s potential impact during operation on groundwater level is less than significant.

4.5.2.2. Groundwater Quality

The Project does not include the installation or operation of water wells, or any extraction or recharge system that is in the vicinity of the coast, an area of known groundwater contamination or seawater intrusion, a municipal supply well or spreading ground facility. The Project does not include surface or subsurface application or introduction of potential contaminants or waste materials during construction or operation. The Project is not anticipated to result in releases or spills of contaminants that could reach a groundwater recharge area or spreading ground or otherwise reach groundwater through percolation. Therefore, the Project’s potential impact on groundwater quality is 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. Provided adherence to the appropriate compliance and containment measures, the Project would result in less than significant impacts related to groundwater quality.
4.5.3. CUMULATIVE IMPACT ANALYSIS

4.5.3.1. GROUNDWATER LEVEL

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. As mentioned above, the purpose of dewatering operations is for the protection of both existing and proposed building structures and temporary groundwater pumping is limited to the top 10-15 feet of the groundwater table (based on the historic high groundwater level). 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 require 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.

4.5.3.2. 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 LA RWQCB 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.
5. 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 level, or groundwater quality.
FIGURE 2
PROPOSED DRAINAGE PATTERNS

DATE: 11/17/16

LEGEND:

STORM DRAIN SYSTEM 1
STORM DRAIN SYSTEM 2
DIRECTION OF FLOW

NOT TO SCALE
## Peak Flow Hydrologic Analysis

File location: P:/2015/115405 Vermont Corridor/ENGR/EIR Support/Exhibits/Vermont Corridor - Site 1 - Vermont Avenue - Existing Drainage.pdf  
Version: HydroCalc 0.3.0-beta

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**Figure 3: Existing Hydrology Calculations**

Hydrograph (Vermont Corridor: Site 1 - Vermont Avenue - Existing Drainage)
Peak Flow Hydrologic Analysis

File location: P:/2015/115405 Vermont Corridor/ENGR/EIR Support/Exhibits/Vermont Corridor - Site 1 - Shatto Place - Existing Drainage.pdf
Version: HydroCalc 0.3.0-beta

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| Output Results                     |                                               |
| Modeled (50-yr) Rainfall Depth (in)| 5.8                                           |
| Peak Intensity (in/hr)             | 3.4604                                        |
| Undeveloped Runoff Coefficient (Cu)| 0.9462                                       |
| Developed Runoff Coefficient (Cd)  | 0.9005                                        |
| Time of Concentration (min)        | 5.0                                           |
| Clear Peak Flow Rate (cfs)         | 2.4834                                        |
| Burned Peak Flow Rate (cfs)        | 2.4834                                        |
| 24-Hr Clear Runoff Volume (ac-ft)  | 0.3411                                        |
| 24-Hr Clear Runoff Volume (cu-ft)  | 14857.705                                     |

Figure 3: Existing Hydrology Calculations

![Hydrograph](image-url)

Hydrograph (Vermont Corridor: Site 1 - Shatto Place - Existing Drainage)
Peak Flow Hydrologic Analysis

Input Parameters

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Output Results

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Figure 3: Existing Hydrology Calculations
## Peak Flow Hydrologic Analysis

File location: P:/2015/115405 Vermont Corridor/ENGR/EIR Support/Exhibits/Vermont Corridor - Site 3- Existing Drainage.pdf
Version: HydroCalc 0.3.0-beta

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Figure 3: Existing Hydrology Calculations

![Hydrograph](image)
## Peak Flow Hydrologic Analysis

File location: P:/2015/115405 Vermont Corridor/ENGR/EIR Support/Exhibits/Vermont Corridor - Site 1 - Vermont Avenue - Proposed Drainage.pdf
Version: HydroCalc 0.3.0-beta

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**Figure 4: Proposed Hydrology Calculations**

![Hydrograph](Image)
Peak Flow Hydrologic Analysis

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Output Results

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Figure 4: Proposed Hydrology Calculations

Hydrograph (Vermont Corridor: Site 1 - Shatto Place - Proposed Drainage)
### Peak Flow Hydrologic Analysis

File location: P:/2015/115405 Vermont Corridor/ENGR/EIR Support/Exhibits/Vermont Corridor - Site 2 - Proposed Drainage.pdf

Version: HydroCalc 0.3.0-beta

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![Figure 4: Proposed Hydrology Calculations](image-url)
## Peak Flow Hydrologic Analysis

File location: P:/2015/115405 Vermont Corridor/ENGR/EIR Support/Exhibits/Vermont Corridor - Site 3 - Proposed Drainage.pdf  
Version: HydroCalc 0.3.0-beta

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**Figure 4: Proposed Hydrology Calculations**
Figure 6: Ballona Creek Watershed Map
Figure 7: FEMA Floodplain Map

PROJECT SITE

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

PANEL 1610 OF 2350
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
GLENDALE, CITY OF 065020 1610 F
LOS ANGELES, CITY OF 060157 1610 F

MAP NUMBER
06037C1610F
EFFECTIVE DATE
SEPTEMBER 26, 2008

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

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov.
SAFETY ELEMENT EXHIBIT G
Inundation & Tsunami Hazard Areas
In the City of Los Angeles

- Flood Control Basin
- Potential Inundation Areas
- Areas Potentially Impacted by a Tsunami

Boundaries of Inundation Areas from Specific Flood Control Basins

Figure 8: Dam Inundation Map
Figure 2-15. Los Angeles Coastal Groundwater Basins.
**Figure 10: Typical SWPPP BMPs**

### Description and Purpose

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

### Suitable Applications

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

### Limitations

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

### Implementation

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

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

---

**Targeted Constituents**

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

**Potential Alternatives**

None

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**Categories**

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<td>Waste Management and Materials Pollution Control</td>
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**Legend:**

- ✓ Primary Objective
- ✗ Secondary Objective
**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 on-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
Figure 10: Typical SWPPP BMPs

Water Conservation Practices

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Legend:

☑ Primary Objective
☒ Secondary Objective

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.

Targeted Constituents

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

Potential Alternatives

None

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CASQA

California Stormwater Quality Association

January 2011
California Stormwater BMP Handbook
Construction
www.casqa.org

1 of 2
Dewatering Operations

### 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
**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.
Figure 10: Typical SWPPP BMPs

Vehicle and Equipment Cleaning

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:

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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Pile Driving Operations

Figure 10: Typical SWPPP BMPs

Description and Purpose
The construction and retrofit of bridges and retaining walls often include crining 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.

Potential Alternatives
None

CASQA

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Concrete Curing

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

Figure 10: Typical SWPPP BMPs

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**

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**Legend:**
- ✓ Primary Objective
- ✗ Secondary Objective

**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

Figure 10: Typical SWPPP BMPs

**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.

**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

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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.

Categories
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Potential Alternatives
None

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Sandbag Barrier

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.

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

Legend:
✔️ Primary Category
✘ Secondary Category

Targeted Constituents
Sediment
Nutrients
Trash
Metals
Bacteria
Oil and Grease
Organics

Potential Alternatives
SE-1 Silt Fence
SE-5 Fiber Rolls
SE-6 Gravel Bag Berm
SE-12 Manufactured Linear Sediment Controls
SE-14 Biofilter Bags

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Figure 10: Typical SWPPP BMPs

**Storm Drain Inlet Protection**

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- ✓ Primary Category
- ✗ Secondary Category

**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
Active Treatment Systems

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

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.

Legend:
- ✔ Primary Objective
- ✗ Secondary Objective

Categories

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</tr>
<tr>
<td>WM</td>
<td>Waste Management and Materials Pollution Control</td>
</tr>
</tbody>
</table>

Targeted Constituents

- Sediment (✔)
- Nutrients
- Trash
- Metals
- Bacteria
- Oil and Grease
- Organics

Potential Alternatives

None

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**Figure 10: Typical SWPPP BMPs**

**Entrance/Outlet Tire Wash**

![Diagram of an entrance/ outlet tire wash](image)

### 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

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### Potential Alternatives

- TC-1 Stabilized Construction Entrance/Exit

---

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---

**CASQA**

California Stormwater Quality Association

January 2011 California Stormwater BMP Handbook

Construction
www.casqa.org
Wind Erosion Control

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:

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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CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

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

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Legend:
- Primary Category
- Secondary Category

Targeted Constituents

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

Potential Alternatives

None

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Material Use

**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**

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**Potential Alternatives**
None

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

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Legend:
☑ Primary Category
☒ Secondary Category

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

Potential Alternatives
None

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Description and Purpose
Prevent or reduce the discharge of pollutants to 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

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Solid Waste Management

**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

**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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Figure 10: Typical SWPPP BMPs

Contaminated Soil Management

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

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

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

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

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

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

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

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

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

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

Categories

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Legend:
- Primary Category
- Secondary Category

Targeted Constituents

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

Potential Alternatives

None

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Figure 10: Typical SWPPP BMPs

Sanitary/Septic Waste Management

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**

**Figure 10: Typical SWPPP BMPs**

---

**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

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**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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CASQA

California Stormwater Quality Association®
### SITE 1

#### Peak Flow Hydrologic Analysis

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#### Output Results

- Modeled (85th percentile storm) Rainfall Depth (in): 1.0
- Peak Intensity (in/hr): 0.4307
- Undeveloped Runoff Coefficient (Cu): 0.1
- Developed Runoff Coefficient (Cd): 0.86
- Time of Concentration (min): 10.0
- Clear Peak Flow Rate (cfs): 0.9937
- Burned Peak Flow Rate (cfs): 0.9937
- 24-Hr Clear Runoff Volume (ac-ft): 0.1801
- 24-Hr Clear Runoff Volume (cu-ft): 7845.2739

### SITE 2

#### Peak Flow Hydrologic Analysis

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#### Output Results

- Modeled (85th percentile storm) Rainfall Depth (in): 1.0
- Peak Intensity (in/hr): 0.4307
- Undeveloped Runoff Coefficient (Cu): 0.1
- Developed Runoff Coefficient (Cd): 0.86
- Time of Concentration (min): 10.0
- Clear Peak Flow Rate (cfs): 0.3682
- Burned Peak Flow Rate (cfs): 0.3682
- 24-Hr Clear Runoff Volume (ac-ft): 0.0706
- 24-Hr Clear Runoff Volume (cu-ft): 9077.4279

### SITE 3

#### Peak Flow Hydrologic Analysis

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#### Output Results

- Modeled (85th percentile storm) Rainfall Depth (in): 1.0
- Peak Intensity (in/hr): 0.4307
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- Developed Runoff Coefficient (Cd): 0.86
- Time of Concentration (min): 10.0
- Clear Peak Flow Rate (cfs): 0.1845
- Burned Peak Flow Rate (cfs): 0.1845
- 24-Hr Clear Runoff Volume (ac-ft): 0.0354
- 24-Hr Clear Runoff Volume (cu-ft): 1541.8099
Potential Zone for Rainwater Cistern within Structure

Site 2 Proposed Site Plan

Source: Steinberg, 2016.
FIGURE 12
Site 3 Proposed Site Plan
Source: Y & M Architects, October 2016.

Potential Zone for Rainwater Cistern On Structure