



City of Fullerton

**County of Orange/Santa Ana Region
Priority Project
Water Quality Management Plan
(WQMP)
Preliminary**

Project Name:

**1223 S. STATE COLLEGE BOULEVARD
1223 S. State College Boulevard
Fullerton, CA 92834**

Prepared for:

**Goodman
18201 Von Karman Ave., Suite 1170
Irvine, CA 92612**

Prepared by:

**Jacob Vandervis P.E.
Tait & Associates, Inc.
701 N. Parkcenter Dr.
Santa Ana, CA 92705
714-560-8200**

Prepared 8/09/2021

**Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project**

Project Owner's Certification			
Planning Application No. (If applicable)		Grading Permit No.	
Tract/Parcel Map and Lot(s) No.		Building Permit No.	
Address of Project Site and APN (If no address, specify Tract/Parcel Map and Lot Numbers)		1223 S. State College Blvd. APN:073-120-27	

This Water Quality Management Plan (WQMP) has been prepared for Goodman by Tait & Associates, Inc. The WQMP is intended to comply with the requirements of the County of Orange NPDES Stormwater Program requiring the preparation of the plan.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan, including the ongoing operation and maintenance of all best management practices (BMPs), and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Owner: Alan Cockburn			
Title	Corporate Development Specialist, Vice President		
Company	GLC Fullerton LLC		
Address	18201 Von Karman Ave., Suite 1170, Irvine, CA 92612		
Email	Alan.Cockburn@goodman.com		
Telephone #	(949)407-0100		
I understand my responsibility to implement the provisions of this WQMP including the ongoing operation and maintenance of the best management practices (BMPs) described herein.			
Owner Signature		Date	

**Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project**

Preparer (Engineer): Jacob Vandervis			
Title	Chief Operation Officer	PE Registration #	46301
Company	Tait & Associates, Inc		
Address	701 N. Parkcenter Dr. Santa Ana, CA 92705		
Email	jvandervis@tait.com		
Telephone #	714-560-8200 ext. 677		
I hereby certify that this Water Quality Management Plan is in compliance with, and meets the requirements set forth in, Order No. R8-2009-0030/NPDES No. CAS618030, of the Santa Ana Regional Water Quality Control Board.			
Preparer Signature		Date	
Place Stamp Here			

Contents

Page No.

Section I	Permit(s) and Water Quality Conditions of Approval or Issuance	1
Section II	Project Description	3
Section III	Site Description	17
Section IV	Best Management Practices (BMPs)	22
Section V	Inspection/Maintenance Responsibility for BMPs	48
Section VI	BMP Exhibit (Site Plan)	54
Section VII	Educational Materials	55

Attachments

Attachment A	Educational Materials
Attachment B	Infiltration Feasibility Worksheet, Summary of Harvested Water Demand and Feasibility Worksheet, Existing Hydrology Map, Proposed Hydrology Map, Calculations, Applicable BMP Fact Sheets, Contech Detention System Information, Storm Gate Details, Modular Wetlands Unit Information, OldCastle FloGard Details
Attachment C	Supporting Maps & Exhibits
Attachment D	Long Term Agreements for Implementation and Maintenance (Operation and Maintenance Plan)
Attachment E	Conditions of Approval
Attachment F	Geotracker, Soils Plume Map, Geotechnical Report
Attachment G	Watershed Map, County Drainage Maps, Impaired Water Bodies List, California Department of Public Health Regulations Related to Recycled Water
Attachment H	Master Covenant & Agreement
Attachment I	Plumbing & Storm Drain Plans

Section I Permit(s) and Water Quality Conditions of Approval or Issuance

Project Information	
Permit/ Application No. (If applicable)	Grading or Building Permit No. (If applicable)
Address of Project Site (or Tract Map and Lot Number if no address) and APN	1223 S. State College Boulevard 073-120-27
Water Quality Conditions of Approval or Issuance	
Water Quality Conditions of Approval or Issuance applied to this project. (Please list verbatim.)	
Conceptual WQMP	
Was a Conceptual Water Quality Management Plan previously approved for this project?	
Watershed-Based Plan Conditions	
Provide applicable conditions from watershed - based plans including WIHMPs and TMDLS.	<u>Kimberly Storm Channel</u> - No TMDLs <u>Fullerton Creek Channel</u> - No TMDLs

**Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project**

	<p><u>Coyote Creek:</u> TMDL: Ammonia, Copper Dissolved, Diazinon, Indicator Bacteria, Lead, Toxicity, pH, Heavy Metals (Technical TMDL¹)</p> <p><u>San Gabriel River Reach 1:</u> TMDL: Coliform Bacteria, pH, Heavy Metals (Technical TMDL¹)</p> <p><u>San Gabriel River Estuary:</u> TMDL: Copper, Dioxin, Nickle, Oxygen, Dissolved</p> <p>WIHMPs = “A model WIHMP has been developed for the Coyote-Creek-San Gabriel River watershed and has been submitted to the Executive Officer for approval, but has not yet been approved”.</p> <p>¹This TMDL has been adopted for Coyote Cree/San Gabriel River by the Los Angeles Regional Water Quality Control Board (Region 4): However, it applies to the areas of Orange County that drain to Coyote Creek and San Gabriel River</p>
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Section II Project Description

II.1 Project Description

Description of Proposed Project				
Development Category (From Model WQMP, Table 7.11-2; or -3):	Category 6: Parking lots 5,000 square feet or more including associated drive aisle, and potentially exposed to urban stormwater runoff.			
Project Area (ft ²): 55,757 SF or 1.28 Ac	Number of Dwelling Units: N.A.		SIC Code: 7521	
Project Area	Pervious		Impervious	
	Area (acres or sq ft)	Percentage	Area (acres or sq ft)	Percentage
Pre-Project Conditions	882 SF or 0.02 Ac	2%	54,875 SF or 1.27 Ac	98%
Post-Project Conditions	4356 SF or 0.1 Ac	8%	51404 SF or 1.27 Ac	92%
Drainage Patterns/Connections	<p><u>On-site Existing Drainage Patterns/Connections:</u></p> <p>The existing project site is 1.28 acres, and it comprises of 2 drainage areas: A₁, which is 0.59 acres, and A₂, which is 0.69 acres. For A₁ drainage, water flows northerly and then easterly via a concrete ribbon gutter to outfall 1 (184.02 Elevation) located at the property line boundary on South State College Boulevard. For A₂ drainage, water flows southerly and then easterly via a concrete ribbon gutter to outfall 2 (184.17 Elevation) located at the property line boundary on South State College Boulevard. For both outfalls 1 and 2 water will flow southerly down South State College Boulevard to the intersection of South State College Boulevard and Orangethorpe Avenue. From there all flows will move westerly via gutter flow to the intersection of Orangethorpe Avenue and Acacia Avenue. Stormwater will then move north on Acacia Avenue to Kimberly Avenue. Flow will enter Kimberly Storm Channel via a catch basin on the Southeast corner of Kimberly Avenue and Acacia Avenue.</p>			

	<p><u>See Attachment G for the existing storm drain and Attachment B which includes the existing hydrology map.</u></p> <p><u>On-site Proposed Drainage Patterns/Connections:</u></p> <p>The proposed project site is 1.28 acres and the proposed drainage patterns will direct water flow generally from the Southeast (184.50 FS) to the Northwest direction (182.29 FS). Water will enter a proposed catch basin on the Northwest corner of the project site. All flows will be conveyed via storm drainpipe to Kimberly storm drain channel as described in the Goodman Logistics Center Fullerton Hydrology report, 2001 E Orangethorpe Ave, dated March 18th 2020 prepared by Tait & Associates.</p> <p>A copy of the project proposed hydrology map is included in attachment B of this report.</p> <p><u>Proposed BMPs:</u></p> <p>BMP - A</p> <p>The entire 1.28 acres will drain to a proposed Biofiltration BMP located on the Goodman Logistic Center site. A Modular wetland system will be used to treat the entire DCV volume.</p>
<p>Narrative Project Description: (Use as much space as necessary.)</p>	<p><u>Community Name:</u> City of Fullerton</p> <p><u>Facility Locations & Sizes:</u></p> <ul style="list-style-type: none">• Proposed parking lot located at 1223 S. State College Blvd. <p><u>Building Use & Activities Conducted:</u></p> <ul style="list-style-type: none">• N/A <p><u>Materials and Products:</u></p> <ul style="list-style-type: none">• The materials or products are not known at this time. <p><u>Waste Generated:</u></p>

- The anticipated waste from the site will be general trash and debris etc.

Paved Areas:

Total AC area of the site consists of 51404 SF or 1.27 Ac.

Landscape Areas:

There is a small landscape area along the right of way of approx. 0.1 acres

Outdoor Material Storage:

No outdoor storage is proposed at this time.

Food Preparation, cooking, eating areas:

No food cooking will occur on site.

Routinely conducted outdoor activities:

Parking.

Existing Site: Currently the site consists of one building and parking. One large building occupies most of the site with driveway and parking around the building.

Land Use:

Parking Lot

II.2 Potential Stormwater Pollutants

Pollutants of Concern			
Pollutant	Check One for each: E=Expected to be of concern N=Not Expected to be of concern		Additional Information and Comments
Suspended-Solid/ Sediment	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	<ul style="list-style-type: none"> consist of soils or other surficial materials that are eroded and then transported or deposited by wind, water, or gravity. Excessive sedimentation can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth. Sediments in runoff also transport other pollutants that adhere to them, including trace metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and phosphorus. The largest source of suspended solids / sediment is typically erosion from disturbed soils.
Nutrients	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	<ul style="list-style-type: none"> includes the macro-nutrients nitrogen and phosphorus. They commonly exist in the form of mineral salts dissolved or suspended in water and as particulate organic matter transported by stormwater. Excessive discharge of nutrients to water bodies and streams can cause eutrophication, including excessive aquatic algae and plant growth, loss of dissolved oxygen, release of toxins in sediment, and significant swings in hydrogen ion concentration (pH). Primary sources of nutrients in urban runoff are fertilizers, trash and debris, and eroded soils. Urban areas with improperly managed landscapes can be substantial sources. Expected as a pollutant of concern due to tributary by uncovered parking areas
Heavy Metals	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	<ul style="list-style-type: none"> Including certain metals that can be toxic to aquatic life if concentrations become high enough to stress natural processes. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and are also raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. Copper and zinc are typically associated with building materials, including galvanized

Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project

			metal and ornamental copper, and automotive products, including tires and brake pads. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns regarding the potential for release of metals to the environment have already led to restricted metal usage in certain applications, for example lead additives in gasoline. The primary source of metals in urban stormwater is typically commercially available metal products and automobiles.
Pathogens (Bacteria/Virus)	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	<ul style="list-style-type: none"> includes bacteria and viruses, which are ubiquitous microorganisms that thrive under a range of environmental conditions. Water containing excessive pathogenic bacteria and viruses can create a harmful environment for humans and aquatic life. The source of pathogenic bacteria and viruses is typically the transport of animal or human fecal wastes from the watershed, but pathogenic organisms do occur in the natural environment.
Pesticides	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	<p>See Toxic Organic Compounds</p> <p>Expected as a pollutant of concern due to tributary by uncovered parking areas.</p>
Oil and Grease	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	<ul style="list-style-type: none"> Characterized as high-molecular weight organic compounds. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality. Introduction of these pollutants to water bodies may occur due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids.
Toxic Organic Compounds	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	<ul style="list-style-type: none"> Includes organic compounds (pesticides, solvents, hydrocarbons) which at toxic concentrations constitute a hazard to humans and aquatic organisms. Stormwater coming into contact with organic compounds can transport excessive levels of organics to receiving waters. Dirt, grease, and grime retained in cleaning fluid or rinse water may also absorb levels of organic compounds that are harmful or hazardous to aquatic life. Sources of organic compounds include landscape maintenance areas, vehicle maintenance areas, waste handling areas, and potentially most other urban areas.
Trash and Debris	E <input checked="" type="checkbox"/>	N <input type="checkbox"/>	<ul style="list-style-type: none"> Includes trash, such as paper, plastic, and various waste materials, that can typically be found throughout the urban landscape, and debris which includes waste products of natural

Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project

			origin which are not naturally discharged to water bodies such as landscaping waste, woody debris, etc. The presence of trash and debris may have a significant impact on the recreational value of a water body and upon the health of aquatic habitat.
--	--	--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

II.3 Hydrologic Conditions of Concern

No - Show map

Yes - Describe applicable hydrologic conditions of concern below. *Refer to Section 2.2.3 in the Technical Guidance Document (TGD).*

Per the North Orange County Hydromodification Susceptibility Map provided in Attachment C, the project site is not located in a Potential Area of Erosion, Habitat, & Physical Structure Susceptibility (See TGD Appendix C Map XVI.3) Kimberly Storm Channel Creek, Fullerton Creek Channel, Coyote Creek, and the San Gabriel River are stabilized. Therefore no HCOC conditions are required for this project.

The results for the 2yr 24hr storm event are as follows:

	Runoff Volume Ac-Ft	Time of Concentration
Pre-Development	0.43	10.465
Post-Development	0.43	10.13
Delta HCOC	0%	3.2%

II.4 Post Development Drainage Characteristics

On-site Proposed Drainage Patterns/Connections:

The proposed project site is 1.28 acres and the proposed drainage patterns will direct water flow generally from the Southeast (184.50 FS) to the Northwest direction (182.29 FS). Water will enter a proposed catch basin on the Northwest corner of the project site. All flows will be conveyed via storm drainpipe to Kimberly storm drain channel as described in the Goodman Logistics Center Fullerton Hydrology report, 2001 E Orangethorpe Ave, dated March 18th 2020 prepared by Tait & Associates.

Off-site Existing Drainage Patterns/Connections: The proposed project is contributing to public storm drain laterals that convey runoff to an existing concrete channel that runs north of Kimberly Avenue., (Kimberly Storm Channel, A03S05) which joins the Fullerton Creek Channel and leads west. Fullerton Creek Channel then joins Coyote Creek which joins the San Gabriel River and ultimately the Pacific Ocean.

See Attachment G for the existing storm drain.

II.5 Property Ownership/Management

Ownership:

Goodman

- A property owners association or homeowners association will not be formed for this project.
- No infrastructure will be transferred to public agency.

Long Term Maintenance:

Goodman will provide long term maintenance of all BMP's for this project.

Section III Site Description

III.1 Physical Setting

Name of Planned Community/Planning Area (if applicable)	1223 State College Boulevard
Location/ Address	The project site is bounded to the north, the west and south by private property and by the east by South State College Blvd.
	1223 S. State College Boulevard Fullerton, CA 92834
General Plan Land Use Designation	Parking
Zoning	Existing: M-P Manufacturing Park & M-G Manufacturing General Proposed: M-G Manufacturing General
Acreage of Project Site	1.28
Predominant Soil Type	The project site location resides within the hydrology soil group B.

III.2 Site Characteristics

Site Characteristics	
Precipitation Zone	The rainfall zone for the project has a design capture storm depth of 0.90" based on the Rainfall zones map on the TGD figure XVI. See Attachment C.
Topography	Topography of the project site is relatively flat with a gentle slope from the west to east and ground surface elevations ranging from ±185 to ±184 feet above mean sea level.
Drainage Patterns/Connections	See Section II.1 for the description of the existing drainage patterns, connections and how it ties into adjacent areas. See Section II.4 for the description of the proposed drainage patterns, connections and how it ties into adjacent areas.
Soil Type, Geology, and Infiltration Properties	The project site location resides within the hydrology soil group B. Group B soils are typically silt loams and loams. They have a moderate infiltration rate when thoroughly wetted and consist chiefly of moderately deep to deep and moderately well to well drained soils with moderately fine to moderately coarse texture.
Hydrogeologic (Groundwater) Conditions	Per the Geotechnical report, groundwater was not encountered to depths of 15 to 30+/- feet. Per the Technical Guidance Document, the groundwater table appears to be between 30 to 50 feet. See Attachment C.
Geotechnical Conditions (relevant to infiltration)	The project site location resides within the hydrology soil group B. Group B soils are typically silt loams and loams. They have a moderate infiltration rate when thoroughly wetted and consist chiefly of moderately deep to deep and moderately well to well drained soils with moderately fine to moderately coarse texture.
Off-Site Drainage	The offsite drainage pattern, from the storm drain lines in Kimberly Ave., leads to the west north of Kimberly Ave. via a reinforced concrete channel (Kimberly Storm Channel, A03S05) which joins the Fullerton Creek Channel and leads west. Fullerton Creek Channel then joins Coyote Creek which joins the San Gabriel River and ultimately the Pacific Ocean.

**Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project**

<p>Utility and Infrastructure Information</p>	<p>Project includes on-site parking lots with lighting. On-site infrastructures will have no impact on proposed BMP's.</p>
-----------------------------------------------	----------------------------------------------------------------------------------------------------------------------------

III.3 Watershed Description

<p>Receiving Waters</p>	<p><u>Kimberly Storm Channel</u> <u>Fullerton Creek Channel</u> <u>Coyote Creek:</u> <u>San Gabriel River Reach 1:</u> <u>San Gabriel River Estuary:</u></p>
<p>303(d) Listed Impairments</p>	<p><u>Kimberly Storm Channel</u>- No Impairments <u>Fullerton Creek Channel</u>- No Impairments <u>Coyote Creek:</u> Ammonia, Copper Dissolved, Diazinon, Indicator Bacteria, Lead, Toxicity, pH <u>San Gabriel River Reach 1:</u> Coliform Bacteria, pH <u>San Gabriel River Estuary:</u> Copper, Dioxin, Nickle, Oxygen, Dissolved</p>
<p>Applicable TMDLs</p>	<p><u>Kimberly Storm Channel</u>- No TMDLs <u>Fullerton Creek Channel</u>- No TMDLs <u>Coyote Creek:</u> TMDL: Ammonia, Copper Dissolved, Diazinon, Indicator Bacteria,</p>

**Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project**

	<p>Lead, Toxicity, pH, Heavy Metals (Technical TMDL¹)</p> <p><u>San Gabriel River Reach 1:</u></p> <p>TMDL: Coliform Bacteria, pH, Heavy Metals (Technical TMDL¹)</p> <p><u>San Gabriel River Estuary:</u></p> <p>TMDL: Copper, Dioxin, Nickle, Oxygen, Dissolved</p> <p>This TMDL has been adopted for Coyote Cree/San Gabriel River by the Los Angeles Regional Water Quality Control Board (Region 4): However, it applies to the areas of Orange County that drain to Coyote Creek and San Gabriel River</p>
<p>Pollutants of Concern for the Project</p>	<p>Suspended-Solid/ Sediment, Nutrients, Indicator Bacteria (pathogens/viruses), Pesticides, Oil and Grease, Toxic Organic Compounds, Metals, Trash and Debris, Toxicity</p>
<p>Environmentally Sensitive and Special Biological Significant Areas</p>	<p>Per the OC Watershed ESA map, the County contains three ESA's: Newport Beach Marine Life Refuge, Irvine Coast Marine Life Refuge, and Heisler Park Ecological Reserve. This project is not located within the three ESA's. See Attachment C for the ESA list and maps.</p>

Section IV Best Management Practices (BMPs)

IV. 1 Project Performance Criteria

<p>(NOC Permit Area only) Is there an approved WHIMP or equivalent for the project area that includes more stringent LID feasibility criteria or if there are opportunities identified for implementing LID on regional or sub-regional basis?</p>	<p>YES <input type="checkbox"/></p>	<p>NO <input checked="" type="checkbox"/></p>
<p>If yes, describe WHIMP feasibility criteria or regional/sub-regional LID opportunities.</p>	<p>There are currently no applicable approved WHIMP's within the watershed for this project.</p>	

<h3>Project Performance Criteria</h3>	
<p>If HCOC exists, list applicable hydromodification control performance criteria (Section 7.II-2.4.2.2 in MWQMP)</p>	<p>In the North Orange County permit area, HCOCs are considered to exist if any streams located downstream from the project are determined to be potentially susceptible to hydromodification impacts <u>and</u> either of the following conditions exists:</p> <ul style="list-style-type: none"> • Post-development runoff volume for the 2-yr, 24-hr storm exceeds the pre-development runoff volume for the 2-yr, 24-hr storm by more than 5 percent Or • Time of concentration of post-development runoff for the 2-yr, 24-hr storm event exceeds the time of concentration of the pre-development condition for the 2-yr, 24-hr storm event by more than 5 percent. Or • The project site is not located in a Potential Area of Erosion, Habitat, & Physical Structure Susceptibility (See TGD Appendix C Map XVI.3)

**Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project**

	<p>Per the North Orange County Hydromodification Susceptibility Map provided in Attachment C, the project site is not located in a Potential Area of Erosion, Habitat, & Physical Structure Susceptibility (See TGD Appendix C Map XVI.3) Kimberly Storm Channel Creek, Fullerton Creek Channel, Coyote Creek, and the San Gabriel River are stabilized. Additionally, the project will not increase the time of concentration beyond 5% of existing conditions or increase the runoff volume. Therefore no HCOC conditions are required for this project.</p>
<p>List applicable LID performance criteria (Section 7.II-2.4.3 from MWQMP)</p>	<p>Modular Wetland system Biofiltration BMP</p>
<p>List applicable treatment control BMP performance criteria (Section 7.II-3.2.2 from MWQMP)</p>	<p>A Proprietary Biofiltration BMP “Modular Wetland System” is proposed to be used for this project. The DCV will be stored in the underground Storage system (basin C) that will convey flows via storm drain to the proposed MWS system before being treated and discharged. Calculations are to ensure that the Goodman Logistics Center MWS and detention basin C have adequate capacity are included in Attachment B. Proprietary treatment BMP locations are shown in Section VI, WQMP Plot Plan.</p>
<p>Calculate LID design storm capture volume for Project.</p>	<p><u>Project Information:</u> d=0.90” (See the “Rainfall Zones” Map in Attachment C) See the following pages for calculations. The calculations have been broken down by Drainage Management Areas (DMA’s).</p>

Worksheet B: Simple Design Capture Volume Sizing Method (DMA A-1)

Step 1: Determine the design capture storm depth used for calculating volume				
1	Enter design capture storm depth from Figure III.1, d (inches) See Appendix XVI.1. Rainfall Zones Map	$d=$	0.90	inches
2	Enter the effect of provided HSCs, d_{HSC} (inches) (Worksheet A)	$d_{HSC}=$	N/A	inches
3	Calculate the remainder of the design capture storm depth, $d_{remainder}$ (inches) (Line 1 – Line 2)	$d_{remainder}=$	0.90	inches
Step 2: Calculate the DCV				
1	Enter Project area tributary to BMP (s), A (acres)	$A=$	1.28	acres
2	Enter Project Imperviousness, imp (unitless)	$imp=$	0.92	
3	Calculate runoff coefficient, $C= (0.75 \times imp) + 0.15$	$C=$	0.84	
4	Calculate runoff volume, $V_{design}= (C \times d_{remainder} \times A \times 43560 \times (1/12))$	$V_{design}=$	3,519	cu-ft
Step 3: Design BMPs to ensure full retention of the DCV				
Step 3a: Determine design infiltration rate				
1	Enter measured infiltration rate, $K_{measured}$ (in/hr) (Appendix VII)	$K_{measured}=$	N.A	In/hr
2	Enter combined safety factor from Worksheet H, S_{final} (unitless)	$S_{final}=$	N.A	
3	Calculate design infiltration rate, $K_{design} = K_{measured} / S_{final}$	$K_{design}=$	N.A	In/hr
Step 3b: Determine minimum BMP footprint				
4	Enter drawdown time, T (max 48 hours)	$T=$	N.A	Hours
5	Calculate max retention depth that can be drawn down within the drawdown time (feet), $D_{max} = K_{design} \times T \times (1/12)$	$D_{max}=$	N.A	feet
6	Calculate minimum area required for BMP (sq-ft), $A_{min} = V_{design} / d_{max}$	$A_{min}=$	N.A	sq-ft

IV.2. Site Design and Drainage

The proposed project site is 1.28 acres and the proposed drainage patterns will direct water flow generally from the Southeast (184.50 FS) to the Northwest direction (182.29 FS). Water will enter a proposed catch basin on the Northwest corner of the project site. All flows will be conveyed via storm drainpipe to Kimberly storm drain channel as described in the Goodman Logistics Center Fullerton Hydrology report, 2001 E Orangethorpe Ave, dated March 18th 2020 prepared by Tait & Associates.

A copy of the project proposed hydrology map is included in **attachment B** of this report.

LID BMPs and Treatment Control BMPs Hierarchy

Infiltration BMPs:

Underground infiltration **will not be utilized** for this project per Table VIII.1 from the TGD, the project is located in a contamination plume (North Basin Groundwater Protection Project) See **Attachment C**; therefore, infiltration is prohibited.

Harvest and Reuse BMPs:

Rainwater harvest cannot be utilized for this project.

Dual plumbed recycled water systems are not accepted by the California State Health Department (See section 60313.General requirements, **Appendix G** for a copy of the "Regulations Related to Recycled Water"). "No person other than a recycled water agency shall deliver recycled water to a dual plumbed facility".

Rainwater harvest for irrigation reuse is not feasible for this project due to the landscape area required. The minimum irrigation area required is 1.29 acres, and the proposed irrigation area for the project is 0.0 acres. See **Appendix B** Worksheet J: Summary of Harvested Water Demand and Feasibility.

Bio-treatment & Evapotranspiration BMPs:

This project will utilize volume based bio-filtration for the entire 1.28 acres.

Treatment Control BMPs:

Treatment control type BMP's will not be used for the project.

IV.3 LID BMP Selection and Project Conformance Analysis

IV.3.1 Hydrologic Source Controls (HSCs)

HSCs not required.

Hydrologic source controls will not be proposed for the project. The site BMP's will meet the DCV with LID BMP's.

Name	Included?
Localized on-lot infiltration	<input type="checkbox"/>
Impervious area dispersion (e.g. roof top disconnection)	<input type="checkbox"/>
Street trees (canopy interception)	<input type="checkbox"/>
Residential rain barrels (not actively managed)	<input type="checkbox"/>
Green roofs/Brown roofs	<input type="checkbox"/>
Blue roofs	<input type="checkbox"/>
Impervious area reduction (e.g. permeable pavers, site design)	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

IV.3.2 Infiltration BMPs

Underground infiltration will be not be utilized for this project.

Name	Included?
Bioretention without underdrains	<input type="checkbox"/>
Rain gardens	<input type="checkbox"/>
Porous landscaping	<input type="checkbox"/>
Infiltration planters	<input type="checkbox"/>
Retention swales	<input type="checkbox"/>
Infiltration trenches	<input type="checkbox"/>
Infiltration basins	<input type="checkbox"/>
Drywells	<input type="checkbox"/>
Subsurface infiltration galleries	<input type="checkbox"/>
French drains	<input type="checkbox"/>
Permeable asphalt	<input type="checkbox"/>
Permeable concrete	<input type="checkbox"/>
Permeable concrete pavers	<input type="checkbox"/>
Other: Underground Infiltration	<input type="checkbox"/>
Other:	<input type="checkbox"/>

Infiltration BMPs:

This project will not utilize an Infiltration -treatment BMP as the project is located next to a groundwater contamination plume

IV.3.3 Evapotranspiration, Rainwater Harvesting BMPs

Name	Included?
All HSCs; <i>See Section IV.3.1</i>	<input type="checkbox"/>
Surface-based infiltration BMPs	<input type="checkbox"/>
Biotreatment BMPs	<input type="checkbox"/>
Above-ground cisterns and basins	<input type="checkbox"/>
Underground detention	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

Harvest and Reuse BMPs:

Rainwater harvest will not be utilized as the entire DCV will be treated using other BMP types

IV.3.4 Biotreatment BMPs

Name	Included?
Bioretention with underdrains	<input type="checkbox"/>
Stormwater planter boxes with underdrains	<input type="checkbox"/>
Rain gardens with underdrains	<input type="checkbox"/>
Constructed wetlands	<input type="checkbox"/>
Vegetated swales	<input type="checkbox"/>
Vegetated filter strips	<input type="checkbox"/>
Proprietary vegetated biotreatment systems	<input checked="" type="checkbox"/>
Wet extended detention basin	<input type="checkbox"/>
Dry extended detention basins	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

This project will utilize a biotreatment BMP as described below:

BMP A

BMP Type: Modular Wetland System

DCV: 3800 CF

Model No.: MWS -L-8-16-8'-9''-V-HC and high-volume chamber storage to treat the DCV (48hr drawdown)

Outfall ID: Outfall 1

Treating DMAs: A-1

IV.3.5 Hydromodification Control BMPs

Per the North Orange County Hydromodification Susceptibility Map provided in Attachment C, the project site is not located in a Potential Area of Erosion, Habitat, & Physical Structure Susceptibility (See TGD Appendix C Map XVI.3) Kimberly Storm Channel Creek, Fullerton Creek Channel, Coyote Creek, and the San Gabriel River are stabilized.

Per Section 2.2.3.1 in the TGD, the calculations in Attachment B show that the post-development runoff volume for the 2-yr, 24-hr storm event does **not** exceed the pre-development runoff volume for the 2-yr, 24-hr storm event by more than 5 percent. The time of concentration for the post-development 2-yr, 24-hr storm event does **NOT increase** from the time of concentration of the pre-development 2-yr, 24-hr storm event by more than 5 percent.

Hydromodification Control BMPs	
BMP Name	BMP Description
N/A	N/A

IV.3.6 Regional/Sub-Regional LID BMPs

Regional/Sub Regional LID BMPs are not applicable for the project.

Regional/Sub-Regional LID BMPs

IV.3.7 Treatment Control BMPs

This project does not propose the use of treatment control BMPs.

Treatment Control BMPs	
BMP Name	BMP Description

IV.3.8 Non-structural Source Control BMPs

Non-Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
N1	Education for Property Owners, Tenants and Occupants	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N2	Activity Restrictions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N3	Common Area Landscape Management	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N4	BMP Maintenance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N5	Title 22 CCR Compliance (How development will comply)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N6	Local Industrial Permit Compliance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N7	Spill Contingency Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N8	Underground Storage Tank Compliance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This project does not contain underground storage tanks.
N9	Hazardous Materials Disclosure Compliance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N10	Uniform Fire Code Implementation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N11	Common Area Litter Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N12	Employee Training	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N13	Housekeeping of Loading Docks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N14	Common Area Catch Basin Inspection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N15	Street Sweeping Private Streets and Parking Lots	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N16	Retail Gasoline Outlets	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This is not a retail gasoline outlet project.

N1- Education for property Owners, Tenants and occupants & N-12 Employee Training

The property owner shall prepare a training manuals for all existing and future employees. The manual shall include information regarding proper practices that contribute to the protection of the stormwater quality. Training shall be provided upon hire of new associates. A copies of the training manuals shall remain in the building at all times for employees to use as needed. The manual shall include all Educational Material included on **Attachment A** of this report. Additional educational material may be found in the following website :

<http://www.ocwatershed.com/PublicEd/resources/business-brochures.html>

N2- Activity Restrictions

The property owner shall ensure that the rules and guidelines as determined by the project conditions of approval or other policies are followed at all times once the project is operational. Prohibited activities for the project that promoted water quality includes:

Prohibit discharges of fertilizer, pesticides, or animal wastes to streets or storm drains.

Prohibit blowing or sweeping of debris (leaf litter, grass clippings, litter, etc.) into streets or storm drains.

Requirement to keep dumpster lids closed at all times.

Prohibit vehicle washing, maintenance, or repair on the premises or restrict those activities to designated areas. (No vehicle maintenance, washing or repair is or are proposed on site)

N3- Common Area Landscape Management

Specific practices are followed for landscape maintenance as identified on the landscape specifications. Ongoing maintenance is conducted to minimize erosion and over-irrigation, conserve water and reduce pesticide and fertilizer applications.

All maintenance must be consistent with the City of Fullerton requirements. Proper maintenance practices should help reduce and/or eliminate pollution from pesticides, nutrients, trash/debris and sediments. The project common area landscape maintenance should be consistent with the following documents included in **Attachment A**:

- Tips for Landscape and Gardening
- Building and Ground Maintenance Guidelines
- Housekeeping practices
- Landscape maintenance

N4- BMP Maintenance

BMP maintenance, implementation schedules and responsible parties are included with each specific BMP narrative in section V.

N5- Title 22 CCR compliance

Hazardous waste shall be managed properly through compliance with applicable title 22 regulations.

Storage and transportation of hazardous materials shall be per the title 22 of the California Code of Regulations and the Health and Safety Code.

N6- Local Water Quality Permit Compliance

The Permittees, under the Water Quality Ordinance, may issue permits to ensure clean stormwater discharges from the site are compliant. At this time the City of Fullerton does not have a specific industrial Water Quality Permit.

N7- Spill Contingency Plan

The building operator shall prepare a Spill Contingency Plan. The plan shall describe how the employees will prepare for and respond to spill of hazardous materials. The plan shall describe the stockpiling of cleanup materials, how to notify the responsible agencies, how to dispose of cleanup materials, the documentation of the spill of hazardous material events.

See **Attachment A** for additional information on plan preparation:

IC17 Spill Prevention and Cleanup

SC-11 Spill Prevention, Control and Cleanup

N9- Hazardous Material Disclosure Compliance

The owner is responsible for obtaining the required permits for the use and transportation of hazardous materials. Permits may be required from the County of Orange Health Department, City of Fullerton and other local authorities.

N10- Uniform Fire Code Implementation

The owner is responsible for complying with the Orange County Fire Department requirements regarding proper management of hazardous materials and emergency response plans. An inventory of hazardous materials shall be maintained on-site and an emergency response plans shall be established.

N11-Common area litter control

The Owner will be required to implement trash management and litter control procedures in the common areas aimed at reducing pollution of drainage water. The Owner may contract with their landscape maintenance firm to provide this service with regularly scheduled maintenance, which should consist of litter patrol, emptying of trash receptacles in common areas, and noting trash disposal violations and reporting the violations to the Owner for investigation.

See **Attachment A** for additional information:

IC3 Building Maintenance

FP-4 Sidewalk, Plaza, and Fountain Maintenance and Cleaning

SC-41 Building and Grounds Maintenance

SC-60 Housekeeping Practices

SC-71 Plaza and Sidewalk Cleaning

N13-Housekeeping of Loading Docks

Refer to “Outdoor Loading/Unloading” in **Attachment A** for procedures, training and other considerations.

N14-Common area catch basin inspection

The Owner must ensure that the on-site drain inlets, grates, and drainpipes will be periodically inspected visually. Cleaning should take place in the late summer/early fall prior to the start of the rainy season. If necessary, clean, repair, or replace any drainage facility prior to the start of each rainy season (no later than October 15 of each year). Also, refer to “Drainage System Maintenance” and “Drainage Facility Operation and Maintenance” in **Attachment A**.

N15-Street Sweeping Private Streets and Parking Lots

The Owner must sweep outdoor lots regularly (minimum monthly) or as needed to maintain parking lot surface without trash, debris, or other removable solids, and prior to the storm season (no later than October 15 each year). Sweeping shall be done with a vacuum-type sweeper. Under no circumstances are outdoor areas/lots to be rinsed or washed with water unless said rinse/wash water is collected and disposed of properly (i.e. into the sewer).

See **Attachment A** for additional information:

IC15 Parking and Storage Area Maintenance

FF-9 Parking Lot Maintenance

SC-43 Parking/Storage Area Maintenance

IV.3.9 Structural Source Control BMPs

Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
S1	Provide storm drain system stenciling and signage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S2	Design and construct outdoor material storage areas to reduce pollution introduction	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This project does not propose the outdoor storage of hazardous materials.
S3	Design and construct trash and waste storage areas to reduce pollution introduction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The proposed project does not include any landscaped areas
S5	Protect slopes and channels and provide energy dissipation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This project does not contain slopes or channel of significance to require the use of energy dissipation devices.
	Incorporate requirements applicable to individual priority project categories (from SDRWQCB NPDES Permit)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable to this project.
S6	Dock areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The proposed project does not include any docks
S7	Maintenance bays	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This project does not contain maintenance bays.
S8	Vehicle wash areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No vehicle wash areas proposed
S9	Outdoor processing areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This project does not contain outdoor processing areas.
S10	Equipment wash areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This project does not contain equipment wash areas.
S11	Fueling areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This project does not contain fueling areas.
S12	Hillside landscaping	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This project is not located on a hillside.

**Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project**

S13	Wash water control for food preparation areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This project does not contain food preparation areas.
S14	Community car wash racks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	This project does not contain community car wash racks.

S1-Provide storm drain system stenciling and signage

All catch basins/inlets/outlets on site must be marked using the City’s “No Dumping – Drains to Ocean” curb marker or stenciled. An approved stencil shall be used to paint this message on the top of curb directly above the inlet, and on one side of the curb face. Labeling for catch basins is to be inspected regularly and maintained so as to be reasonably legible at all times. The inspection and maintenance is to be performed by the Owner. This stencil is to alert the public/employees to the destination of pollutants discharged into the storm water.

See CASQA Stormwater Handbook BMP Fact Sheet SD-13 ([Attachment A](#)) for additional information.

S3-Design and construct trash and waste storage areas to reduce pollution introduction

The owner shall post signs on trash enclosure gates that state “Keep Dumpster Lids Closed.” The Owner will monitor dumpster usage such that dumpsters are not overfilled and the dumpster lids can close completely. The Owner shall increase the trash pickup schedule as necessary to prevent dumpsters from overflowing. The Owner will observe and damage to the trash enclosure wall and any discharge from the trash storage area.

Trash storage areas shall be designed to reduce pollutant introduction. All trash container areas shall meet the following requirements:

1. Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent off-site transport of trash; and
2. Provide solid roof or awning to prevent direct precipitation.

Connection of trash area drains to the municipal storm drain system is prohibited.

Potential conflicts with fire code and garbage hauling activities should be considered in implementing this source control.

See CASQA Stormwater Handbook Section 3.2.9 and BMP Fact Sheet SD-32 ([Attachment A](#)) for additional information.

IV.4 Alternative Compliance Plan (If Applicable)

IV.4.1 Water Quality Credits

**Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project**

Description of Proposed Project				
Project Types that Qualify for Water Quality Credits (Select all that apply):				
<input type="checkbox"/> Redevelopment projects that reduce the overall impervious footprint of the project site.	<input type="checkbox"/> Brownfield redevelopment, meaning redevelopment, expansion, or reuse of real property which may be complicated by the presence or potential presence of hazardous substances, pollutants or contaminants, and which have the potential to contribute to adverse ground or surface WQ if not redeveloped.	<input type="checkbox"/> Higher density development projects which include two distinct categories (credits can only be taken for one category): those with more than seven units per acre of development (lower credit allowance); vertical density developments, for example, those with a Floor to Area Ratio (FAR) of 2 or those having more than 18 units per acre (greater credit allowance).		
<input type="checkbox"/> Mixed use development, such as a combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that can demonstrate environmental benefits that would not be realized through single use projects (e.g. reduced vehicle trip traffic with the potential to reduce sources of water or air pollution).	<input type="checkbox"/> Transit-oriented developments, such as a mixed use residential or commercial area designed to maximize access to public transportation; similar to above criterion, but where the development center is within one half mile of a mass transit center (e.g. bus, rail, light rail or commuter train station). Such projects would not be able to take credit for both categories, but may have greater credit assigned		<input type="checkbox"/> Redevelopment projects in an established historic district, historic preservation area, or similar significant city area including core City Center areas (to be defined through mapping).	
<input type="checkbox"/> Developments with dedication of undeveloped portions to parks, preservation areas and other previous uses.	<input type="checkbox"/> Developments in a city center area.	<input type="checkbox"/> Developments in historic districts or historic preservation areas.	<input type="checkbox"/> Live-work developments, a variety of developments designed to support residential and vocational needs together – similar to criteria to mixed use development; would not be able to take credit for both categories.	<input type="checkbox"/> In-fill projects, the conversion of empty lots and other underused spaces into more beneficially used spaces, such as residential or commercial areas.
Calculation of Water Quality Credits (if applicable)	Not Applicable			

IV.4.2 Alternative Compliance Plan Information

Not Applicable

Section V Inspection/Maintenance Responsibility for BMPs

The responsible party of inspection and Maintenance for the plan will be the project owner. The “Owners” as referred below is GLC Fullerton LLC and their information is listed below:

GLC Fullerton LLC
18201 Von Karman Ave., Suite 1170
Irvine, CA 92612

The owner is aware of the maintenance responsibilities of the proposed BMP’s. A funding mechanism will be established to maintain the BMP’s at the frequency stated in the WQMP.

The owner will be responsible for long term funding for the inspection and maintenance of the proposed BMP’s.

BMP Inspection/Maintenance			
BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N1. Education for Property Owners, Tenants and Occupants	Owner	The owner shall prepare a training manual along with the Operations and Maintenance Manual for all existing and future employees. The manual shall include information regarding proper practices that contribute to the protection of the stormwater quality. Training shall be provided upon hire of new associates. A copy of the training manual shall remain in the building at all times for employees to use as needed. The manual shall include all Educational Material included Attachment A of this report. Additional education material may be found in the following website : http://www.ocwatershed.com/PublicEd/resources/business-brochures.html	Quarterly. Training shall be provided upon hire and regular intervals thereafter.

Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project

N2. Activity Restrictions	Owner	<p>The property owner shall ensure that the rules and guidelines as determined on the project conditions of approval or other policies are followed at all times once the project is operations.</p> <p>Prohibited activities for the project that promoted water quality includes:</p> <p>Prohibit discharges of fertilizer, pesticides, or animal wastes to streets or storm drains.</p> <p>Prohibit blowing or sweeping of debris (leaf litter, grass clippings, litter, etc.) into streets or storm drains.</p> <p>Requirement to keep dumpster lids closed at all times.</p> <p>Prohibit vehicle washing, maintenance, or repair on the premises on-site.</p>	Ongoing
N4. BMP Maintenance	Owner	All proposed BMP's shall be regularly maintained.	Ongoing
N5. Title 22 CCR Compliance	Owner	<p>Hazardous waste shall be managed properly through compliance with applicable title 22 regulations.</p> <p>Storage and transportation of hazardous materials shall be per the title 22of the California Code of Regulations and the Health and Safety Code</p>	Every time handling of hazardous materials is required
N7. Spill Contingency Plan	Owner	<p>The owner shall develop a spill contingency plan. Owner shall ensure adequate spill/leak prevention measures are stored on-site and employees are made aware of their location. Owner shall ensure adequate training on spill response procedures, cleanup procedures, and reporting. This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills. Refer to Attachment A SC-11 for additional information on</p>	Yearly Training of Employees & Every time handling of hazardous materials is required

Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project

		Inspection/Maintenance procedures and activities.	
N10. Uniform Fire Code Implementation	Owner	The owner is responsible for complying with the Orange County Fire Department requirements regarding proper management of hazardous materials and emergency response plans. An inventory of hazardous materials should be maintained on-site and an emergency response plans should be established.	Procedures shall be established prior to building occupancy.
N11. Common Area Litter Control	Owner	The Owner will be required to implement trash management and litter control procedures in the common areas aimed at reducing plution of drainage water. The Owner may contract with their landscape maintenace firm to provide this service with regularly scheduled maintenance, which should consist of litter patrol, emptying of trash receptacles in common areas, and noting trash disposal violations and reporting the violations to the Owner for investigation	Ongoing
N12. Employee Training	Owner	The owner shall prepare a training manual for all existing and future employees. The manual shall include information regarding proper practices that contribute to the protection of the stormwater quality. Training shall be provided upon hire of new associates. A copy of the training manual shall remain in the building at all times for employees to use as needed. The manual shall include all Educational Material included on Attachment A of this report. Additional education material may be found in the following website : http://www.ocwatershed.com/Public	Quarterly. Training shall be provided upon hire and regular intervals thereafter.

Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project

		Ed/resources/business-brochures.html	
N14. Common Area Catch Basin Inspection	Owner	The owner must ensure that the on-site inlet and drain pipe will be periodically inspected visually. Cleaning should take place in the late summer/early fall prior to the start of the rainy season. If necessary, clean, repair, or replace any drainage facility prior to the start of each rainy season (no later than October 15 of each year).	Monthly -Before and after predicted storm events
N15. Street Sweeping Private Streets and Parking Lots	Owner	The Owner must sweep outdoor lots regularly (minimum monthly), or as needed to maintain parking lot surface without trash, debris, or other removable solids, and prior to the storm season (no later than October 15 each year). Sweeping shall be done with a vacuum-type sweeper. Under no circumstances are outdoor areas/lots to be rinsed or washed with water unless said rinse/wash water is collected and disposed of properly (i.e. into the sewer).	Monthly

BMP Inspection/Maintenance			
BMP	Responsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
S1. Provide Storm Drain System Stenciling and Signage	Owner	All catch basins/inlets/outlets/parkway drains on site must be marked using the City's "No Dumping - Drains to Ocean" curb marker or stenciled using an approved stencil to paint this message on the top of curb directly above the inlet, and on one side of the curb face. Labeling for catch basins & parkway drains is to be inspected regularly and maintained so as to be reasonably legible at all times. The inspection and maintenance is to be performed by the Owner. This stencil is to alert the public/employees to the destination of pollutants discharged into the storm water.	Annually
Proprietary Biotreatment BMP (Modular Wetland system)	Owner	Refer to the manufacturer's maintenance specifications included in Attachment D	Refer to the manufacturer's maintenance specifications included in Attachment D
Proprietary Stormwater Storage System (vault)	Owner	Refer to the manufacturer's maintenance specifications included in Attachment D	Refer to the manufacturer's maintenance specifications included in Attachment D
Enviropod Catch Basin Media Filter Inserts	Owner	Refer to the manufacturer's maintenance specifications included in Attachment D	Refer to the manufacturer's maintenance specifications included in Attachment D

Section VI BMP Exhibit (Site Plan)

VI.1 BMP Exhibit (Site Plan)

- See following page

VI.2 Submittal and Recordation of Water Quality Management Plan

Following approval of the Final Project-Specific WQMP, three copies of the approved WQMP (including BMP Exhibit, Operations and Maintenance (O&M) Plan, and Appendices) shall be submitted. In addition, these documents shall be submitted in a PDF format.

Each approved WQMP (including BMP Exhibit, Operations and Maintenance (O&M) Plan, and Appendices) shall be recorded in the Orange County Clerk-Recorder's Office, prior to close-out of grading and/or building permit. Educational Materials are not required to be included.

Section VII Educational Materials

Refer to the Orange County Stormwater Program (ocwatersheds.com) for a library of materials available. Please only attach the educational materials specifically applicable to this project. Other materials specific to the project may be included as well and must be attached.

Education Materials			
Residential Material (http://www.ocwatersheds.com)	Check If Applicable	Business Material (http://www.ocwatersheds.com)	Check If Applicable
The Ocean Begins at Your Front Door	<input type="checkbox"/>	Tips for the Automotive Industry	<input type="checkbox"/>
Tips for Car Wash Fund-raisers	<input type="checkbox"/>	Tips for Using Concrete and Mortar	<input type="checkbox"/>
Tips for the Home Mechanic	<input type="checkbox"/>	Tips for the Food Service Industry	<input type="checkbox"/>
Homeowners Guide for Sustainable Water Use	<input type="checkbox"/>	Proper Maintenance Practices for Your Business	<input checked="" type="checkbox"/>
Household Tips	<input type="checkbox"/>	Other Material	Check If Attached
Proper Disposal of Household Hazardous Waste	<input type="checkbox"/>		
Recycle at Your Local Used Oil Collection Center (North County)	<input type="checkbox"/>	Tips for Protecting Your Watershed	<input checked="" type="checkbox"/>
Recycle at Your Local Used Oil Collection Center (Central County)	<input type="checkbox"/>	SD-10 Site Design & Landscape Planning (NO LANDSCAPING PROPOSED)	<input type="checkbox"/>
Recycle at Your Local Used Oil Collection Center (South County)	<input type="checkbox"/>	SD-11 Roof Runoff Controls (NO BUILDINGS PROPOSED)	<input type="checkbox"/>
Tips for Maintaining a Septic Tank System	<input type="checkbox"/>	SD-12 Efficient Irrigation (NO LANDSCAPING PROPOSED)	<input type="checkbox"/>
Responsible Pest Control	<input type="checkbox"/>	SD-13 Storm Drain Signage	<input checked="" type="checkbox"/>
Sewer Spill	<input type="checkbox"/>	SD-32 Trash Storage Areas	<input checked="" type="checkbox"/>
Tips for the Home Improvement Projects	<input type="checkbox"/>	IC2 Animal Handling Areas (NO ANIMAL HANDELING PROPOSED)	<input type="checkbox"/>
Tips for Horse Care	<input type="checkbox"/>	IC3 Building Maintenance (NO BUILDINGS PROPOSED)	<input type="checkbox"/>
Tips for Landscaping and Gardening	<input checked="" type="checkbox"/>	IC7 Landscape Maintenance (NO LANDSCAPE PROPOSED)	<input type="checkbox"/>
Tips for Pet Care	<input type="checkbox"/>	IC15 Parking and Storage Area Maintenance	<input checked="" type="checkbox"/>
Tips for Pool Maintenance	<input type="checkbox"/>	IC17 Spill Prevention and Cleanup	<input checked="" type="checkbox"/>
Tips for Residential Pool, Landscape and Hardscape Drains	<input type="checkbox"/>		<input type="checkbox"/>
Tips for Projects Using Paint	<input type="checkbox"/>	FP-2 Landscape Maintenance (NO	<input type="checkbox"/>

**Priority Project Water Quality Management Plan (WQMP)
Fullerton Warehouse Facility Project**

		LANDSCAPE PROPOSED)	
		FP-4 Sidewalk, Plaza, and Fountain Maintenance and Cleaning (NO SIDEWALK PROPOSED)	<input type="checkbox"/>
		FP-5 Solid Waste Handling	<input checked="" type="checkbox"/>
		FF-9 Parking Lot Maintenance	<input checked="" type="checkbox"/>
		DF-1 Drainage Facility Operation and Maintenance	<input checked="" type="checkbox"/>
		SC-10 Non-Stormwater Discharges	<input checked="" type="checkbox"/>
		SC-11 Spill Prevention, Control and Cleanup	<input checked="" type="checkbox"/>
		SC-34 Waste Handling and Disposal	<input checked="" type="checkbox"/>
		SC-41 Building and Grounds Maintenance (NO BUILDINGS PROPOSED)	<input type="checkbox"/>
		SC-43 Parking/Storage Area Maintenance	<input checked="" type="checkbox"/>
		SC-60 Housekeeping Practices	<input checked="" type="checkbox"/>
		SC-71 Plaza and Sidewalk Cleaning	<input checked="" type="checkbox"/>
		SC-73 Landscape Maintenance (NO LANDSCAPE PROPOSED)	<input type="checkbox"/>
		SC-74 Drainage System Maintenance	<input checked="" type="checkbox"/>
		SD-31 Maintenance Bays & Docks (NO DOCKS PROPOSED)	<input type="checkbox"/>

ATTACHMENT A
EDUCATIONAL MATERIALS



SOLID WASTE HANDLING

It is important to control litter to eliminate trash and other materials in storm water runoff. Waste reduction is a major component of waste management and should be encouraged through training and public outreach. Management of waste once it is collected may involve reuse, recycling, or proper disposal. Specific solid waste handling activities may include one or more of the following:

1. Solid Waste Collection
2. Waste Reduction and Recycling
3. Hazardous Waste Collection
4. Litter Control

Reduce by purchasing only the amount needed.
Reuse products when possible.
Recycle leftover products that are recyclable, and dispose of other wastes safely.

POLLUTION PREVENTION:

Pollution prevention measures have been considered and incorporated in the model procedures. Implementation of these measures may be more effective and reduce or eliminate the need to implement other more complicated or costly procedures. Possible pollution prevention measures for solid waste handling include:

- Reuse products when possible.
- Recycle leftover products that are recyclable.
- Once per year, educate municipal staff on pollution prevention measures.

MODEL PROCEDURES:

1. Solid Waste Collection

- ✓ Implement procedures, where applicable, to collect, transport, and dispose of solid waste at appropriate disposal facilities in accordance with applicable federal, state, and local laws and regulations. Optional disposal options include the reuse and recycling of appropriate materials (see following sections).

- ✓ Include properly designed trash storage areas.
- ✓ Regularly inspect solid waste containers for structural damage. Repair or replace damaged containers as necessary.
- ✓ Secure solid waste containers; containers must be closed tightly when not in use.
- ✓ Do not fill waste containers with washout water or any other liquid.
- ✓ Remove all debris from containers prior to cleaning with water. Only clean out containers in a designated area that drains to a washrack that is connected to a sanitary sewer.
- ✓ Minimize spillage/leaking from solid waste containers. For larger solid waste containers (especially compactors) that utilize a hydraulic fluid pump system, regularly inspect and replace faulty pumps or hoses to minimize the potential of releases and spills.
- ✓ Ensure that only appropriate solid wastes are disposed of. Certain wastes such as hazardous wastes, appliances, fluorescent bulbs, pesticides, etc. may not be disposed of in solid waste containers.

Also see Emergency Spill Response procedure sheet.

2. Waste Reduction and Recycling

Although many types of waste can be recycled, recycling options for each waste type may be limited. All gasoline, antifreeze, waste oil, and lead-acid batteries can be recycled. Latex and oil-based paint can be reused, as well as recycled. Materials that cannot be reused or recycled should be disposed of properly.

- ✓ Provide containers for the collection and storage of recyclable materials.
- ✓ Do not mix liquid wastes, this can cause chemical reactions or make recycling impossible and complicate disposal.
- ✓ Recycle used motor oil. Municipalities are required to have a used oil recycling element within their integrated waste management plan.

CalRecycle has a Recycling Hotline, (800) RECYCLE, that provides information and recycling locations for used oil.

3. Hazardous Waste Collection

Household hazardous wastes (HHW) are defined as waste materials which are typically found in homes or similar sources, which exhibit characteristics such as: corrosivity, ignitability, reactivity, and/or toxicity, or are listed as hazardous materials by EPA.

List of most common HHW products:

Drain opener
 Oven cleaners
 Wood and metal cleaners and polishes
 Paint Thinners
 Automotive oil and fuel additives
 Adhesives
 Grease and rust solvents Batteries
 Herbicides
 Paint strippers and removers Pesticides
 Fungicides/wood preservatives
 Starter fluids
 Carburetor and fuel injection cleaners

✓ Follow proper storage and disposal measures for hazardous waste materials as identified on packaging or Material Safety Data Sheets.

✓ Emergencies related to hazardous waste should be reported to 911

OPTIONAL:

- Identify and promote use of non-hazardous alternatives.
- Promote household hazardous waste (HHW) reuse and recycling.

4. Litter Control

✓ Enforce anti-litter laws.

✓ Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.

✓ Clean out and cover litter receptacles frequently to prevent overflow.

✓ Increase litter control for events generating substantial quantities of litter.

OPTIONAL:

- Post “No Littering” signs
- Place trash receptacles at transit stops and maintain as necessary.
- Participate in and/or organize additional clean-up programs (e.g., “Coastal Clean Up Day”, “Pride Days”, “Volunteer Connection Days”).

REFERENCES:

Bay Area Stormwater Management Agencies Association. 1996. *Pollution From Surface Cleaning*.

California Storm Water Best Management Practice Handbooks. Municipal Best Management Practice Handbook. Prepared by Camp Dresser & McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

Environmental Protection Agency (EPA). *Pollution Prevention and Good Housekeeping for Municipal Operations Storm Water. Pet Waste Collection.* Office of Wastewater Management. Online:

http://www.epa.gov/npdes/menuofbmps/poll_3.htm

Harvard University. 2002. Solid Waste Container Best Management Practices – Fact Sheet On-Line Resources – Environmental Health and Safety.

IC10. OUTDOOR LOADING/UNLOADING OF MATERIALS

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner¹. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	
Metals	x
Bacteria	
Oil & Grease	x
Organics & Toxicants	x
Pesticides	x
Oxygen Demanding	

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Park vehicles and conduct loading/unloading only in designated loading/unloading areas so that spills or leaks can be contained.
- Clean loading/unloading areas regularly to remove potential sources of pollutants.
- Reduce exposure of materials to rain.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections.
- Inspect equipment regularly.
- If possible, conduct loading and unloading in dry weather.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

- 1. Properly design loading/unloading areas to prevent storm water runoff, runoff of spills, etc.**
 - Grade and/or berm the area to prevent runoff.
 - Position roof downspouts to direct stormwater away from the area.
 - Grade and/or berm the loading/unloading area to a drain that is connected to a dead-end.
 - The area where truck transfers take place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
 - Avoid placing loading/unloading areas near storm drains.
- 2. Park vehicles and conduct loading/unloading only in designated loading/unloading areas so that spills or leaks can be contained.**
- 3. Clean loading/unloading areas regularly to remove potential sources of pollutants.** This includes outside areas that are regularly covered by containers or other materials.
- 4. Reduce exposure of materials to rain.**
 - Cover the loading/unloading areas.
 - If a cover is unfeasible, use overhangs, or seals or door skirts to enclose areas.
- 5. Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections.**

¹ EPA " Preliminary Data Summary of Urban Stormwater Best Management Practices"

6. Inspect equipment regularly

- Designate a responsible party to check under delivery vehicles for leaking fluids, spilled materials, debris, or other foreign materials.
- Check loading/unloading equipment regularly for leaks.

7. If possible, conduct loading and unloading in dry weather.

Training

- 1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.**
- 2. Train employees on proper spill containment and cleanup.**
 - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
 - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
 - Fact sheet IC17 discusses Spill Prevention and Control in detail.
- 3. Train employees on the proper techniques used during liquid transfers to avoid leaks and spills.**
- 4. Train forklift operators on the proper loading and unloading procedures.**
- 5. Establish a regular training schedule, train all new employees, and conduct annual refresher training.**
- 6. Use a training log or similar method to document training.**

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003.
www.cabmphandbooks.com

California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser & McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Stormwater Management Manual for Western Washington. Volume IV Source Control BMPs. Prepared by Washington State Department of Ecology Water Quality Program. Publication No. 99-14. August 2001.

For additional information contact:

County of Orange/ OC Watersheds

Main: (714) 955-0600

24 hr Water Pollution Hotline: 1-877-89-SPILL

or visit our website at www.ocwatersheds.com

IC15. PARKING AND STORAGE AREA MAINTENANCE

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner¹. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	x
Bacteria	x
Oil & Grease	x
Organics & Toxicants	x
Pesticides	x
Oxygen Demanding	x

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Conduct regular cleaning.
- Properly collect and dispose of wash water.
- Keep the parking and storage areas clean and orderly.
- Use absorbent materials and properly dispose of them when cleaning heavy oily deposits.
- When conducting surface repair work cover materials and clean paintbrushes and tools appropriately.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Conduct regular cleaning.

- Sweeping or vacuuming the parking facility is encouraged over other methods.
- Sweep all parking lots at least once before the onset of the wet season.
- Establish frequency of sweeping based on usage and field observations of waste accumulation.

2. Properly collect and dispose of wash water.

- Block the storm drain or contain runoff.
- Wash water should be collected and pumped to the sanitary sewer or discharged to a pervious surface, do not allow wash water to enter storm drains. Refer to fact sheet **IC24 Wastewater Disposal** for guidance on appropriate methods for disposal of wash water to the sanitary sewer.
- Dispose of parking lot sweeping debris and dirt at a landfill.

3. Consider use of source treatment BMPs to treat runoff.

- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.

¹ EPA " Preliminary Data Summary of Urban Stormwater Best Management Practices"

4. **Keep the parking and storage areas clean and orderly.**
 - Clean out and cover litter receptacles frequently to prevent spillage.
 - Remove debris in a timely fashion.OPTIONAL:
 - Post “No Littering” signs.
5. **When cleaning heavy oily deposits:**
 - If possible, clean oily spots with absorbent materials.
 - Do not allow discharges to the storm drain.
 - Appropriately dispose of spilled materials and absorbents.
6. **When conducting surface repair work:**
 - Pre-heat, transfer or load hot bituminous material away from storm drain inlets.
 - Conduct surface repair work during dry weather to prevent contamination from contacting stormwater runoff.
 - Cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and clean any debris for proper disposal.
 - To avoid runoff, use only as much water as necessary for dust control.
 - Use drip pans or absorbent material to catch drips from paving equipment that is not in use. Dispose of collected material and absorbents properly.
7. **Conduct inspections on a regular basis.**
 - Designate personnel to conduct inspections of the parking facilities and stormwater conveyance systems associated with them.
 - Inspect cleaning equipment/sweepers for leaks on a regular basis.
8. **Keep accurate maintenance logs to evaluate materials removed/stored and improvements made.**
9. **Arrange rooftop drains to prevent drainage directly onto paved surfaces.**

Training

1. **Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.**
2. **Train employees on proper spill containment and cleanup.**
 - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
 - Ensure that employees are familiar with the site’s spill control plan and/or proper spill cleanup procedures.
 - Fact sheet IC17 discusses Spill Prevention and Control in detail.
3. **Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.**
4. **Establish a regular training schedule, train all new employees, and conduct annual refresher training.**
5. **Use a training log or similar method to document training.**

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read “No Dumping Drains to Ocean”.

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003.
www.cabmphandbooks.com

California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser & McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. King County Surface Water Management. July 1995. On-line: <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Stormwater Management Manual for Western Washington. Volume IV Source Control BMPs. Prepared by Washington State Department of Ecology Water Quality Program. Publication No. 99-14. August 2001.

For additional information contact:

County of Orange/ OC Watersheds

Main: (714) 955-0600

24 hr Water Pollution Hotline: 1-877-89-SPILL

or visit our website at www.ocwatersheds.com

IC17. SPILL PREVENTION AND CLEANUP

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner¹. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	x
Bacteria	x
Oil & Grease	x
Organics & Toxicants	x
Pesticides	x
Oxygen Demanding	x

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

Spill Prevention

1. **Develop procedures to prevent/mitigate spills to storm drain systems.**
Standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
2. **Post “No Dumping” signs with a phone number for reporting illegal dumping and disposal.**
3. **Conduct routine cleaning, inspections, and maintenance**
 - Sweep and clean storage areas consistently at a designated frequency (e.g. weekly, monthly). **DO NOT** hose down areas to storm drains.
 - Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Reuse, recycle, or properly dispose of any collected liquids or soiled absorbent materials.
 - Check tanks (and any containment sumps) frequently for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

MINIMUM BEST MANAGEMENT PRACTICES Pollution Prevention/Good Housekeeping

- Develop procedures to prevent/mitigate spills to storm drain systems.
- Post “No Dumping” signs with a phone number for reporting illegal dumping and disposal.
- Conduct routine cleaning, inspections, and maintenance.
- Properly store and handle chemical materials.
- Protect materials stored outside from stormwater runoff.
- Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- Identify key spill response personnel.
- Clean up leaks and spills immediately.
- Report and track spills.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

¹ EPA "Preliminary Data Summary of Urban Stormwater Best Management Practices"

- Check for external corrosion of material containers, structural failures, spills and overfills due to operator error, failure of piping system, etc.
 - Inspect tank foundations, connections, coatings, and tank walls and piping system.
- 4. Properly store and handle chemical materials.**
- Designate a secure material storage area that is paved with Portland cement concrete, free of cracks and gaps, and impervious in order to contain leaks and spills.
 - Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containers.
 - Keep chemicals in their original containers, if feasible.
 - Keep containers well labeled according to their contents (e.g., solvent, gasoline).
 - Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
 - Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
- 5. Utilize secondary containment systems for liquid materials.**
- Surround storage tanks with a berm or other secondary containment system.
 - Slope the area inside the berm to a drain.
 - Drain liquids to the sanitary sewer if available. **DO NOT** discharge wash water to sanitary sewer until contacting the local sewer authority to find out if pretreatment is required
 - Pass accumulated stormwater in petroleum storage areas through an oil/water separator.
 - Use catch basin filtration inserts.
- 6. Protect materials stored outside from stormwater runoff.** Construct a berm around the perimeter of the material storage area to prevent the runoff of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the material.
- 7. Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.**

Spill Control and Cleanup Activities

- 8. Identify key spill response personnel.**
- 9. Adopt the Orange County Hazardous Materials Area Plan or an equivalent plan, which includes a set of planned responses to hazardous materials emergencies. The plan should include:**
- Description of the facility, owner and address, activities and chemicals present
 - Facility map
 - Notification and evacuation procedures
 - Cleanup instructions
 - Identification of responsible departments
- 10. Clean up leaks and spills immediately.**
- Place a stockpile of spill cleanup materials where they will be readily accessible (e.g. near storage and maintenance areas).
 - Utilize dry cleaning methods to clean up spills to minimize the use of water. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste. Physical methods for the cleanup of dry chemicals include the use brooms, shovels, sweepers, or plows.
 - Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
 - Clean up chemical materials with absorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
 - For larger spills, a private spill cleanup company or Hazmat team may be necessary.

11. Reporting

1. **Report spills that pose an immediate threat to human health or the environment to local agencies, such as the fire department, and the Regional Water Quality Control Board.**
2. **Establish a system for tracking incidents. The system should be designed to identify the following:**
 - Types and quantities (in some cases) of wastes
 - Patterns in time of occurrence (time of day/night, month, or year)
 - Mode of dumping (abandoned containers, “midnight dumping” from moving vehicles, direct dumping of materials, accidents/spills)
 - Responsible parties
3. **Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).**

Training

1. **Educate employees about spill prevention and cleanup.**
 - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
 - Educate employees on aboveground storage tank requirements.
 - Train all employees upon hiring and conduct annual refresher training.
2. **Train employees responsible for aboveground storage tanks and liquid transfers on the Spill Prevention Control and Countermeasure Plan.**

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read “No Dumping Drains to Ocean”.

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003.
www.cabmphandbooks.com

California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser & McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Stormwater Management Manual for Western Washington. Volume IV Source Control BMPs. Prepared by Washington State Department of Ecology Water Quality Program. Publication No. 99-14. August 2001.

For additional information contact:

County of Orange/ OC Watersheds

Main: (714) 955-0600

24 hr Water Pollution Hotline: 1-877-89-SPILL

or visit our website at www.ocwatersheds.com



Preventing water pollution at your commercial/industrial site

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many landscape and building maintenance activities can lead to water pollution if you're not careful. Paint, chemicals, plant clippings and other materials can be blown or washed into storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour soap or fertilizers into the ocean, so why would you let them enter the storm drains? Follow these easy tips to help prevent water pollution.

Some types of industrial facilities are required to obtain coverage under the State General Industrial Permit. For more information visit: www.swrcb.ca.gov/stormwater/industrial.html

For more information, please call the

Orange County Stormwater Program
at 1-877-89-SPILL (1-877-897-7455)

or visit

www.ocwatersheds.com

To report a spill, call the

Orange County 24-Hour Water Pollution Problem Reporting Hotline

at 1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.



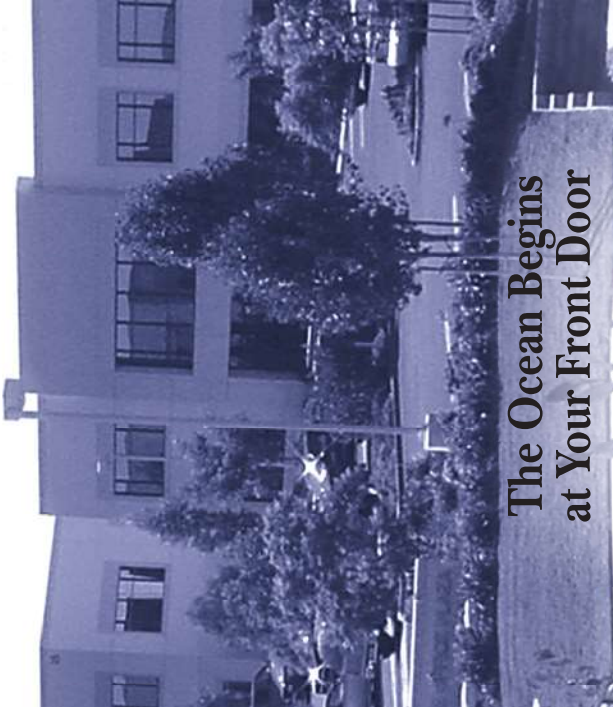
RECYCLE
USED OIL



Printed on Recycled Paper

Help Prevent Ocean Pollution:

Proper Maintenance Practices for Your Business



The Ocean Begins at Your Front Door



Proper Maintenance Practices for your Business

Landscape Maintenance

- Compost grass clippings, leaves, sticks and other vegetation, or dispose of it at a permitted landfill or in green waste containers. Do not dispose of these materials in the street, gutter or storm drain.
- Irrigate slowly and inspect the system for leaks, overspraying and runoff. Adjust automatic timers to avoid overwatering.
- Follow label directions for the use and disposal of fertilizers and pesticides.
- Do not apply pesticides or fertilizers if rain is expected within 48 hours or if wind speeds are above 5 mph.
- Do not spray pesticides within 100 feet of waterways.
- Fertilizers should be worked into the soil rather than dumped onto the surface.
- If fertilizer is spilled on the pavement or sidewalk, sweep it up immediately and place it back in the container.

Building Maintenance

- Never allow wastewater, sweepings or sediment to enter the storm drain.
- Sweep up dry spills and use cat litter, towels or similar materials to absorb wet spills. Dispose of it in the trash.
- If you wash your building, sidewalk or parking lot, you **must** contain the water. Use a shop vac to collect the water and contact your city or sanitation agency for proper disposal information. Do not let water enter the street, gutter or storm drain.
- Use drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of materials in the trash.
- Use a ground cloth or oversized tub for mixing paint and cleaning tools.
- Use a damp mop or broom to clean floors.
- Cover dumpsters to keep insects, animals, rainwater and sand from entering. Keep the area around the dumpster clear of trash and debris. Do not overfill the dumpster.

- Call your trash hauler to replace leaking dumpsters.

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or near a storm drain. Even materials that seem harmless such as latex paint or biodegradable cleaners can damage the environment.

**NEVER DISPOSE
OF ANYTHING
IN THE STORM
DRAIN.**

- Recycle paints, solvents and other materials. For more information about recycling and collection centers, visit www.oclandfills.com.
- Store materials indoors or under cover and away from storm drains.
- Use a construction and demolition recycling company to recycle lumber, paper, cardboard, metals, masonry, carpet, plastic, pipes, drywall, rocks, dirt, and green waste. For a listing of construction and demolition recycling locations in your area, visit www.ciwmb.ca.gov/recycle.
- Properly label materials. Familiarize employees with Material Safety Data Sheets.



The Ocean Begins at Your Front Door



PROJECT
Possution
PREVENTION

Follow these simple steps to help reduce water pollution:

Household Activities

- Do not rinse spills with water. Use dry cleanup methods such as applying cat litter or another absorbent material, sweep and dispose of in the trash. Take items such as used or excess batteries, oven cleaners, automotive fluids, painting products and cathode ray tubes, like TVs and computer monitors, to a Household Hazardous Waste Collection Center (HHWCC).
- For a HHWCC near you call (714) 834-6752 or visit www.oclandfills.com.

- Do not hose down your driveway, sidewalk or patio to the street, gutter or storm drain. Sweep up debris and dispose of it in the trash.

Automotive

- Take your vehicle to a commercial car wash whenever possible. If you wash your vehicle at home, choose soaps, cleaners, or detergents labeled non-toxic, phosphate-free or biodegradable. Vegetable and citrus-based products are typically safest for the environment.
- Do not allow washwater from vehicle washing to drain into the street, gutter or storm drain. Excess washwater should be disposed of in the sanitary sewer (through a sink or toilet) or onto an absorbent surface like your lawn.
- Monitor your vehicles for leaks and place a pan under leaks. Keep your vehicles well maintained to stop and prevent leaks.
- Never pour oil or antifreeze in the street, gutter or storm drain. Recycle these substances at a service station, a waste oil collection center or used oil recycling center. For the nearest Used Oil Collection Center call 1-800-CLEANUP or visit www.1800cleanup.org.

Pool Maintenance

- Pool and spa water must be dechlorinated and free of excess acid, alkali or color to be allowed in the street, gutter or storm drain.
- When it is not raining, drain dechlorinated pool and spa water directly into the sanitary sewer.
- Some cities may have ordinances that do not allow pool water to be disposed of in the storm drain. Check with your city.

Landscape and Gardening

- Do not over-water. Water your lawn and garden by hand to control the amount of water you use or set irrigation systems to reflect seasonal water needs. If water flows off your yard onto your driveway or sidewalk, your system is over-watering. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of waste by composting, hauling it to a permitted landfill, or as green waste through your city's recycling program.
- Follow directions on pesticides and fertilizer, (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Take unwanted pesticides to a HHWCC to be recycled. For locations and hours of HHWCC, call (714) 834-6752 or visit www.oclandfills.com.

Trash

- Place trash and litter that cannot be recycled in securely covered trash cans.
- Whenever possible, buy recycled products.
- Remember: Reduce, Reuse, Recycle.

Pet Care

- Always pick up after your pet. Flush waste down the toilet or dispose of it in the trash. Pet waste, if left outdoors, can wash into the street, gutter or storm drain.
- If possible, bathe your pets indoors. If you must bathe your pet outside, wash it on your lawn or another absorbent/permeable surface to keep the washwater from entering the street, gutter or storm drain.
- Follow directions for use of pet care products and dispose of any unused products at a HHWCC.

Common Pollutants

Home Maintenance

- Detergents, cleaners and solvents
- Oil and latex paint
- Swimming pool chemicals
- Outdoor trash and litter

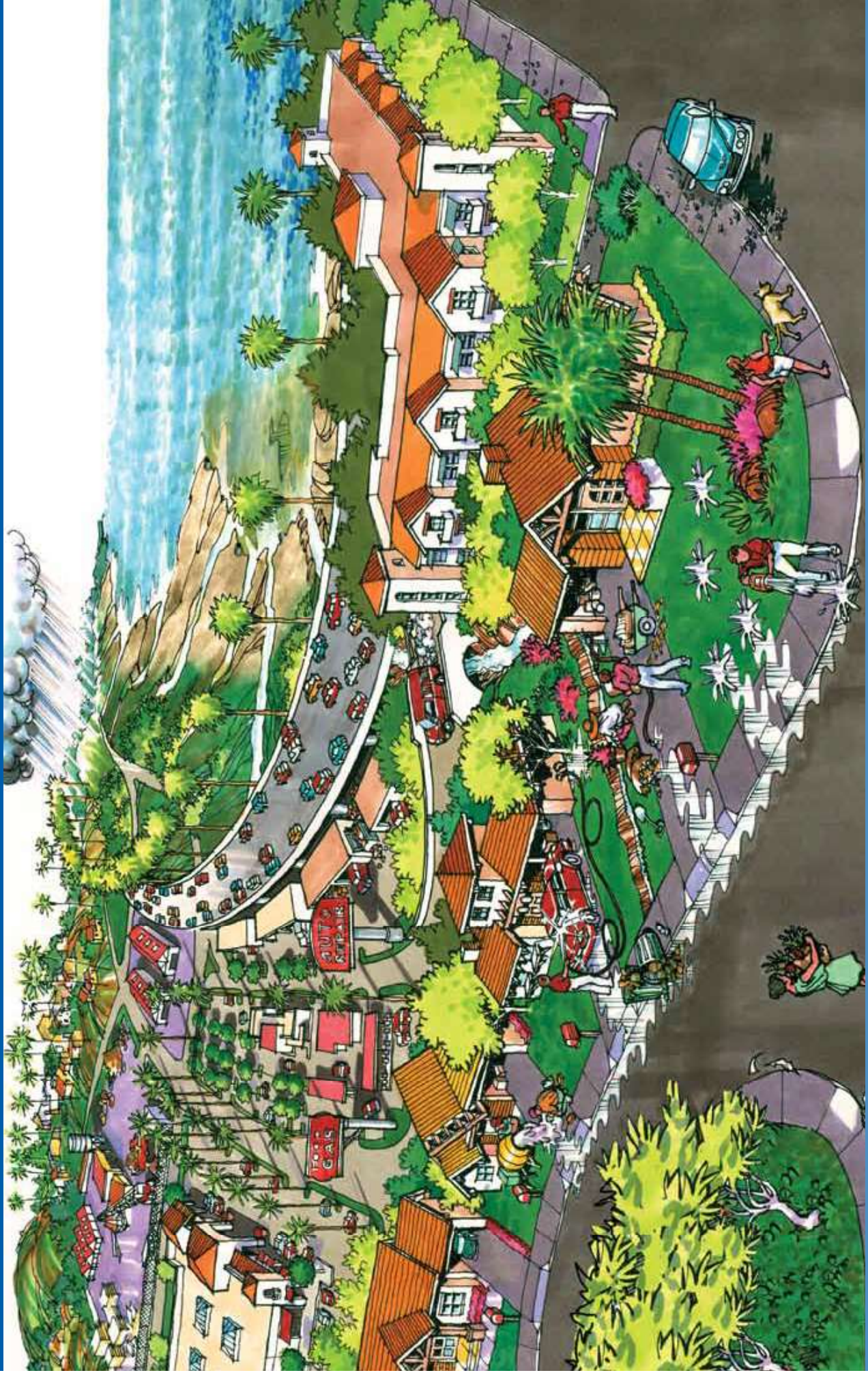
Lawn and Garden

- Pet and animal waste
- Pesticides
- Clippings, leaves and soil
- Fertilizer

Automobile

- Oil and grease
- Radiator fluids and antifreeze
- Cleaning chemicals
- Brake pad dust

The Ocean Begins at Your Front Door



Never allow pollutants to enter the street, gutter or storm drain!

Did You Know?

- Most people believe that the largest source of water pollution in urban areas comes from specific sources such as factories and sewage treatment plants. In fact, the largest source of water pollution comes from city streets, neighborhoods, construction sites and parking lots. This type of pollution is sometimes called “non-point source” pollution.
- There are two types of non-point source pollution: stormwater and urban runoff pollution.
- Stormwater runoff results from rainfall. When rainstorms cause large volumes of water to rinse the urban landscape, picking up pollutants along the way.
- Urban runoff can happen any time of the year when excessive water use from irrigation, vehicle washing and other sources carries trash, lawn clippings and other urban pollutants into storm drains.

Where Does It Go?

- Anything we use outside homes, vehicles and businesses – like motor oil, paint, pesticides, fertilizers and cleaners – can be blown or washed into storm drains.
- A little water from a garden hose or rain can also send materials into storm drains.
- Storm drains are separate from our sanitary sewer systems; unlike water in sanitary sewers (from sinks or toilets), water in storm drains is not treated before entering our waterways.

Sources of Non-Point Source Pollution

- Automotive leaks and spills.
- Improper disposal of used oil and other engine fluids.
- Metals found in vehicle exhaust, weathered paint, rust, metal plating and tires.
- Pesticides and fertilizers from lawns, gardens and farms.
- Improper disposal of cleaners, paint and paint removers.
- Soil erosion and dust debris from landscape and construction activities.
- Litter, lawn clippings, animal waste, and other organic matter.
- Oil stains on parking lots and paved surfaces.



The Effect on the Ocean



Non-point source pollution can have a serious impact on water quality in Orange County. Pollutants from the storm drain system can harm marine life as well as coastal and wetland habitats. They can also degrade recreation areas such as beaches, harbors and bays.

Stormwater quality management programs have been developed throughout Orange County to educate and encourage the public to protect water quality, monitor runoff in the storm drain system, investigate illegal dumping and maintain storm drains.

Support from Orange County residents and businesses is needed to improve water quality and reduce urban runoff pollution. Proper use and disposal of materials will help stop pollution before it reaches the storm drain and the ocean.



For More Information

Orange County Stormwater Program

California Environmental Protection Agency

www.calepa.ca.gov

- **Air Resources Board**
www.arb.ca.gov
- **Department of Pesticide Regulation**
www.cdpr.ca.gov
- **Department of Toxic Substances Control**
www.dtsc.ca.gov
- **Integrated Waste Management Board**
www.ciwmb.ca.gov
- **Office of Environmental Health Hazard Assessment**
www.oehha.ca.gov
- **State Water Resources Control Board**
www.waterboards.ca.gov

Earth 911 - Community-Specific Environmental Information 1-800-cleanup or visit www.1800cleanup.org

Health Care Agency's Ocean and Bay Water Closure and Posting Hotline
(714) 433-6400 or visit www.ocbeachinfo.com

Integrated Waste Management Dept. of Orange County (714) 834-6752 or visit www.oclandfills.com for information on household hazardous waste collection centers, recycling centers and solid waste collection

O.C. Agriculture Commissioner
(714) 447-7100 or visit www.ocagcomm.com

Stormwater Best Management Practice Handbook
Visit www.cabmphandbooks.com

UC Master Gardener Hotline
(714) 708-1646 or visit www.uccemg.com

The Orange County Stormwater Program has created and moderates an electronic mailing list to facilitate communications, take questions and exchange ideas among its users about issues and topics related to stormwater and urban runoff and the implementation of program elements. To join the list, please send an email to ocstormwaterinfo-join@list.ocwatersheds.com

Aliso Viejo	(949)	425-2535
Anaheim Public Works Operations	(714)	765-6860
Brea Engineering	(714)	990-7666
Buena Park Public Works	(714)	562-3655
Costa Mesa Public Services	(714)	754-5323
Cypress Public Works	(714)	229-6740
Dana Point Public Works	(949)	248-3584
Fountain Valley Public Works	(714)	593-4441
Fullerton Engineering Dept.	(714)	738-6853
Garden Grove Public Works	(714)	741-5956
Huntington Beach Public Works	(714)	536-5431
Irvine Public Works	(949)	724-6315
La Habra Public Services	(562)	905-9792
La Palma Public Works	(714)	690-3310
Laguna Beach Water Quality	(949)	497-0378
Laguna Hills Public Services	(949)	707-2650
Laguna Niguel Public Works	(949)	362-4337
Laguna Woods Public Works	(949)	639-0500
Lake Forest Public Works	(949)	461-3480
Los Alamitos Community Dev.	(562)	431-3538
Mission Viejo Public Works	(949)	470-3056
Newport Beach, Code & Water		
Quality Enforcement	(949)	644-3215
Orange Public Works	(714)	532-6480
Placentia Public Works	(714)	993-8245
Rancho Santa Margarita	(949)	635-1800
San Clemente Environmental Programs	(949)	361-6143
San Juan Capistrano Engineering	(949)	234-4413
Santa Ana Public Works	(714)	647-3380
Seal Beach Engineering	(562)	431-2527 x317
Stanton Public Works	(714)	379-9222 x204
Tustin Public Works/Engineering	(714)	573-3150
Villa Park Engineering	(714)	998-1500
Westminster Public Works/Engineering	(714)	898-3311 x446
Yorba Linda Engineering	(714)	961-7138
Orange County Stormwater Program	(877)	897-7455
Orange County 24-Hour		
Water Pollution Problem Reporting Hotline		
1-877-89-SPILL (1-877-897-7455)		

On-line Water Pollution Problem Reporting Form
www.ocwatersheds.com



Printed on Recycled Paper

Help Prevent Ocean Pollution:

Tips For Protecting Your Watershed

Clean beaches and healthy creeks, rivers, bays and

ocean are important to Orange County. However, if we are not careful, our daily activities can lead directly to water pollution problems. Water that drains through your watershed can pick up pollutants which are then transported to our waterways and beautiful ocean.

You can prevent water pollution by taking personal action and by working with members of your watershed community to prevent urban runoff from entering your waterway.



For more information,
please call the
Orange County Stormwater Program
at **1.877.89.SPILL**
or visit
www.ocwatersheds.com

To report a spill,
call the
**Orange County 24-Hour
Water Pollution Problem
Reporting Hotline**
at **1.877.89.SPILL**.

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help protect your watershed. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



Printed on Recycled Paper

WHAT STARTS HERE



COULD TRAVEL HERE



WHICH FLOWS
THROUGH HERE



AND ENDS UP HERE



The Ocean Begins
at Your Front Door



Tips for Protecting Your Watershed

My Watershed. Our Ocean.

Water + shed, *noun*: A region of land within which water flows down into a specified water body, such as a river, lake, sea, or ocean; a drainage basin or catchment basin.

Orange County is comprised of 11 major watersheds into which most of our water flows, connecting all of Orange County to the Pacific Ocean.



As water from rain (stormwater) or sprinklers and hoses (urban runoff) runs down your driveway and into your neighborhood streets, sidewalks and gutters, it flows into storm drains that lead to waterways within your watershed. The waterways from other cities merge as they make their way through our watersheds until all the runoff water in Orange County meets at the Pacific Ocean. The water that reaches our ocean is not pure. As it flows through the watershed, it picks up pollutants such as litter, cigarette butts, fertilizer, pesticides, pet waste, motor oil and lawn clippings. Unlike water that enters the sewer (from sinks and toilets), water that enters the storm drain is not treated before it flows, ultimately, to the ocean.



Water quality can be improved by “Adopting Your Watershed.” Through this effort, we are challenging citizens and

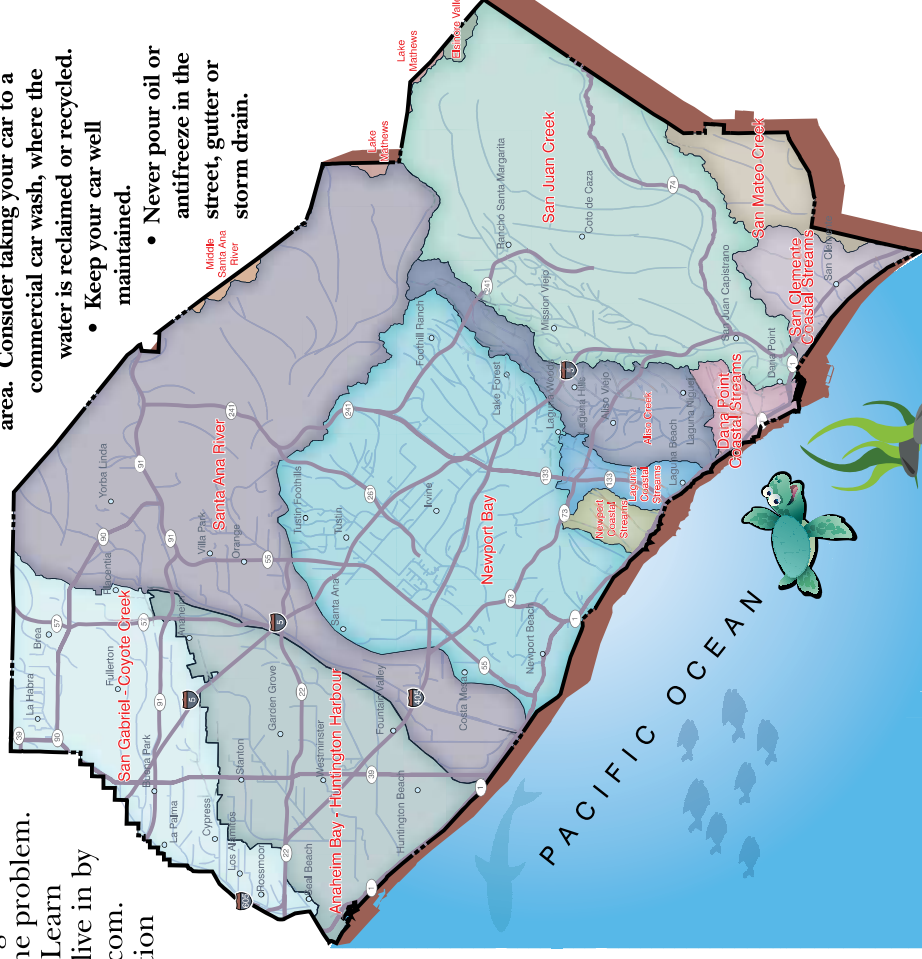
organizations to join the Orange County Stormwater Program and others who are working to protect and restore our creeks, rivers, bays and ocean.

There are many opportunities to get involved:

- Appreciate your watershed - explore the creeks, trails and ocean and make observations about its conditions. If you see anything abnormal (such as dead fish, oil spills, leaking barrels, and other pollution) contact the Orange County 24-hour water pollution problem reporting hotline at 1.877.89.SPILL to report the problem.
- Research your watershed. Learn about what watershed you live in by visiting www.ocwatersheds.com.
- Find a watershed organization in your community and volunteer to help. If there are no active groups, consider starting your own.
- Visit EPA's Adopt Your Watershed's Catalog of Watershed Groups at www.epa.gov/adopt to locate groups in your community.
- Organize or join in a creek, river, bay or ocean cleanup event such as Coastal & Inner Coastal Cleanup Day that takes place the 3rd Saturday of every September. For more information visit www.coast4u.org.

Follow these simple tips to protect the water quality of your watershed:

- Sweep up debris and dispose of it in the trash. Do not hose down driveways or sidewalks into the street or gutter.
- Use dry cleanup methods such as cat litter to absorb spills and sweep up residue.
- Set your irrigation systems to reflect seasonal water needs or use weather-based controllers. Inspect for runoff regularly.
- Cover trashcans securely.
- Take hazardous waste to a household hazardous waste collection center. (For example, paint, batteries and petroleum products)
- Pick up after your pet.
- Follow application and disposal directions for pesticides and fertilizers.
- If you wash your car at home, wash it on your lawn or divert the runoff onto a landscaped area. Consider taking your car to a commercial car wash, where the water is reclaimed or recycled.
 - Keep your car well maintained.
 - Never pour oil or antifreeze in the street, gutter or storm drain.



ATTACHMENT B

- INFILTRATION FEASIBILITY WORKSHEET,
- SUMMARY OF HARVESTED WATER DEMAND AND FEASIBILITY WORKSHEET,
- EXISTING HYDROLOGY MAP
- PROPOSED HYDROLOGY MAP
- DMA MATRIX & DCV EXCEL TABLE CALCULATIONS
 - Excel Matrix
 - 85th Percentile Rainfall Zones (XVI-1)
 - DCV Worksheets for Capture Efficiency Method
 - Worksheets C & D
- APPLICABLE BMP FACT SHEETS
- INFILTRATION SYSTEM INFORMATION
- STORM GATE DETAIL
- OLDCASTLE FLOGARD DETAILS

Table 2.7: Infiltration BMP Feasibility Worksheet

	Infeasibility Criteria	Yes	No
1	Would Infiltration BMPs pose significant risk for groundwater related concerns? Refer to Appendix VIII (Worksheet I) for guidance on groundwater-related infiltration feasibility criteria.	X	
<p>Provide basis:</p> <p>Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
2	<p>Would Infiltration BMPs pose significant risk of increasing risk of geotechnical hazards that cannot be mitigated to an acceptable level? (Yes if the answer to any of the following questions is yes, as established by a geotechnical expert):</p> <ul style="list-style-type: none"> • The BMP can only be located less than 50 feet away from slopes steeper than 15 percent • The BMP can only be located less than eight feet from building foundations or an alternative setback. • A study prepared by a geotechnical professional or an available watershed study substantiates that stormwater infiltration would potentially result in significantly increased risks of geotechnical hazards that cannot be mitigated to an acceptable level. 		X
<p>Provide basis:</p> <p>Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
3	Would infiltration of the DCV from drainage area violate downstream water rights?		X
<p>Provide basis:</p> <p>Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			

Table 2.7: Infiltration BMP Feasibility Worksheet (continued)

	<i>Partial Infeasibility Criteria</i>	Yes	No
4	Is proposed infiltration facility located on HSG D soils or the site geotechnical investigation identifies presence of soil characteristics which support categorization as D soils?		X
Provide basis: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
5	Is measured infiltration rate below proposed facility less than 0.3 inches per hour? This calculation shall be based on the methods described in Appendix VII .		X
Provide basis: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
6	Would reduction of over predeveloped conditions cause impairments to downstream beneficial uses, such as change of seasonality of ephemeral washes or increased discharge of contaminated groundwater to surface waters?		X
Provide citation to applicable study and summarize findings relative to the amount of infiltration that is permissible: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
7	Would an increase in infiltration over predeveloped conditions cause impairments to downstream beneficial uses, such as change of seasonality of ephemeral washes or increased discharge of contaminated groundwater to surface waters?		X
Provide citation to applicable study and summarize findings relative to the amount of infiltration that is permissible: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Table 2.7: Infiltration BMP Feasibility Worksheet (continued)

Infiltration Screening Results (check box corresponding to result):		
8	<p>Is there substantial evidence that infiltration from the project would result in a significant increase in I&I to the sanitary sewer that cannot be sufficiently mitigated? (See Appendix XVII)</p> <p>Provide narrative discussion and supporting evidence:</p> <p>Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>	No, I & I has not been analyzed for this project at this time.
9	<p>If any answer from row 1-3 is yes: infiltration of any volume is not feasible within the DMA or equivalent.</p> <p>Provide basis: Project is located next to a groundwater contamination plume</p> <p>Summarize findings of infeasibility screening</p>	X
10	<p>If any answer from row 4-7 is yes, infiltration is permissible but is not presumed to be feasible for the entire DCV. Criteria for designing biotreatment BMPs to achieve the maximum feasible infiltration and ET shall apply.</p> <p>Provide basis:</p> <p>Summarize findings of infeasibility screening</p>	
11	<p>If all answers to rows 1 through 11 are no, infiltration of the full DCV is potentially feasible, BMPs must be designed to infiltrate the full DCV to the maximum extent practicable.</p>	

■

Worksheet H: Factor of Safety and Design Infiltration Rate and Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) $p = w \times v$
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Tributary area size	0.25		
		Level of pretreatment/ expected sediment loads	0.25		
		Redundancy	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor, $S_{Total} = S_A \times S_B$					
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					
Supporting Data					
Briefly describe infiltration test and provide reference to test forms: N.A. AS INFILTRATION BMPS WILL NOT BE USED					

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Table VII.4: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Tributary area size	Greater than 10 acres.	Greater than 2 acres but less than 10 acres.	2 acres or less.
Level of pretreatment/ expected influent sediment loads	Pretreatment from gross solids removal devices only, such as hydrodynamic separators, racks and screens AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pretreatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be relatively low (e.g., low traffic, mild slopes, disconnected impervious areas, etc.).	Excellent pretreatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops.
Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

VII.4.1. Site Suitability Considerations

Suitability assessment related considerations include ([Table VII.3](#)):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent of fines can greatly influence the potential for clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally) as determined from site investigations are more difficult to estimate average properties for resulting in a higher level of uncertainty associated with initial estimates.
- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Table VII.3: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods (see explanation below)	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Texture Class	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<5 ft below facility bottom	5-10 ft below facility bottom	>10 below facility bottom

Localized infiltration testing refers to methods such as the double ring infiltrometer test (ASTM D3385-88) which measure infiltration rates over an area less than 10 sq-ft, may include lateral

Table X.8: Minimum Irrigated Area for Potential Partial Capture Feasibility

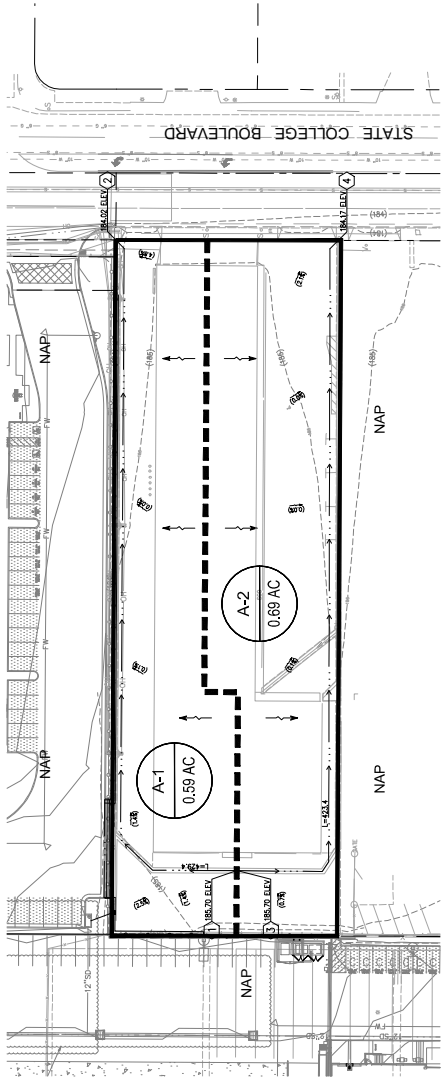
General Landscape Type	Conservation Design: $K_L = 0.35$			Active Turf Areas: $K_L = 0.7$		
	<i>Closest ET Station</i>	<i>Irvine</i>	<i>Santa Ana</i>	<i>Laguna</i>	<i>Irvine</i>	<i>Santa Ana</i>
Design Capture Storm Depth, inches	Minimum Required Irrigated Area per Tributary Impervious Acre for Potential Partial Capture, ac/ac					
0.60	0.66	0.68	0.72	0.33	0.34	0.36
0.65	0.72	0.73	0.78	0.36	0.37	0.39
0.70	0.77	0.79	0.84	0.39	0.39	0.42
0.75	0.83	0.84	0.90	0.41	0.42	0.45
0.80	0.88	0.90	0.96	0.44	0.45	0.48
0.85	0.93	0.95	1.02	0.47	0.48	0.51
0.90	0.99	1.01	1.08	0.49	0.51	0.54
0.95	1.04	1.07	1.14	0.52	0.53	0.57
1.00	1.10	1.12	1.20	0.55	0.56	0.60

Worksheet J: Summary of Harvested Water Demand and Feasibility

1	What demands for harvested water exist in the tributary area (check all that apply):		
2	Toilet and urinal flushing		<input type="checkbox"/>
3	Landscape irrigation		<input checked="" type="checkbox"/>
4	Other: _____		<input type="checkbox"/>
5	What is the design capture storm depth? (Figure III.1)	d	0.90 inches
6	What is the project size?	A	1.28 ac
7	What is the acreage of impervious area?	IA	1.28 ac
For projects with multiple types of demand (toilet flushing, indoor demand, and/or other demand)			
8	What is the minimum use required for partial capture? (Table X.6)		N.A. gpd
9	What is the project estimated wet season total daily use?		N.A. gpd
10	Is partial capture potentially feasible? (Line 9 > Line 8?)		N.A.
For projects with only toilet flushing demand			
11	What is the minimum TUTIA for partial capture? (Table X.7)		N.A.
12	What is the project estimated TUTIA?		N.A.

Worksheet J: Summary of Harvested Water Demand and Feasibility

13	Is partial capture potentially feasible? (Line 12 > Line 11?)	N.A.	
For projects with only irrigation demand			
14	What is the minimum irrigation area required based on conservation landscape design? (Table X.8)	1.29	ac
15	What is the proposed project irrigated area? (multiply conservation landscaping by 1; multiply active turf by 2)	0.0	ac
16	Is partial capture potentially feasible? (Line 15 > Line 14?)	NO	
<p>Provide supporting assumptions and citations for controlling demand calculation: Line 14: KL x Line 7 Line 14: 1.28 x 1.01= 1.29 Line 15: Landscape Area = 00 Line 15 < Line 14 Therefore, re-use for irrigation is not feasible.</p>			



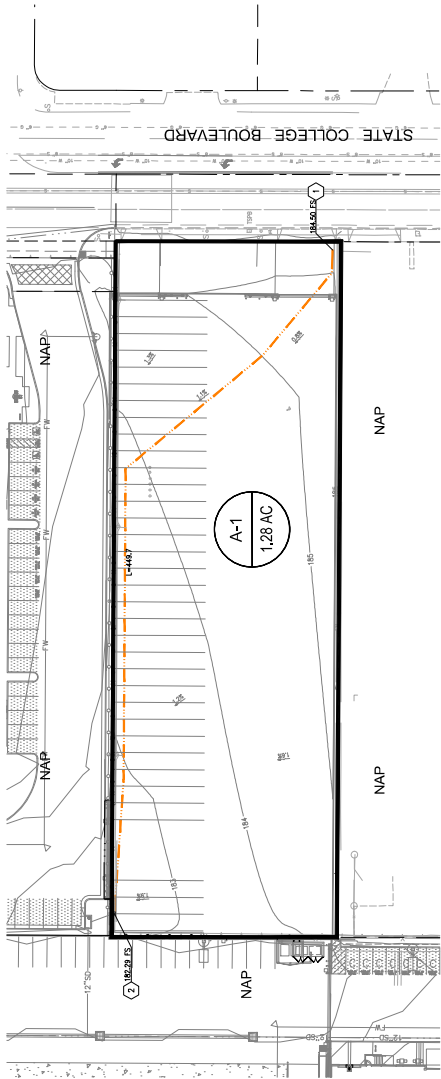
LEGEND

- EXISTING CENTERLINE
- EXISTING SURFACE
- PROPOSED GRADE
- INLET
- FLOW LINE
- EXISTING SLOPE
- EXISTING STORM DRAIN
- AREA BOUNDARY
- SUB-AREA BOUNDARY
- NODE
- AREA D
- AREA (AC)

ABBREVIATIONS

- EX
- PG
- BT
- ASSUMES ROOF RAINFALL IS 2% FOR HYDROLOGIC MODELING PURPOSES





LEGEND

- PROPOSED CENTROID
- FLOW LINE
- SURFACE DIRECTION OF FLOW
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN ≤ 12"
- PROPOSED STORM DRAIN > 12"
- STORM DRAIN PIPE FLOW
- AREA BOUNDARY
- SUB-AREA BOUNDARY
- NOTE
- AREA ID
- AREA (AC)

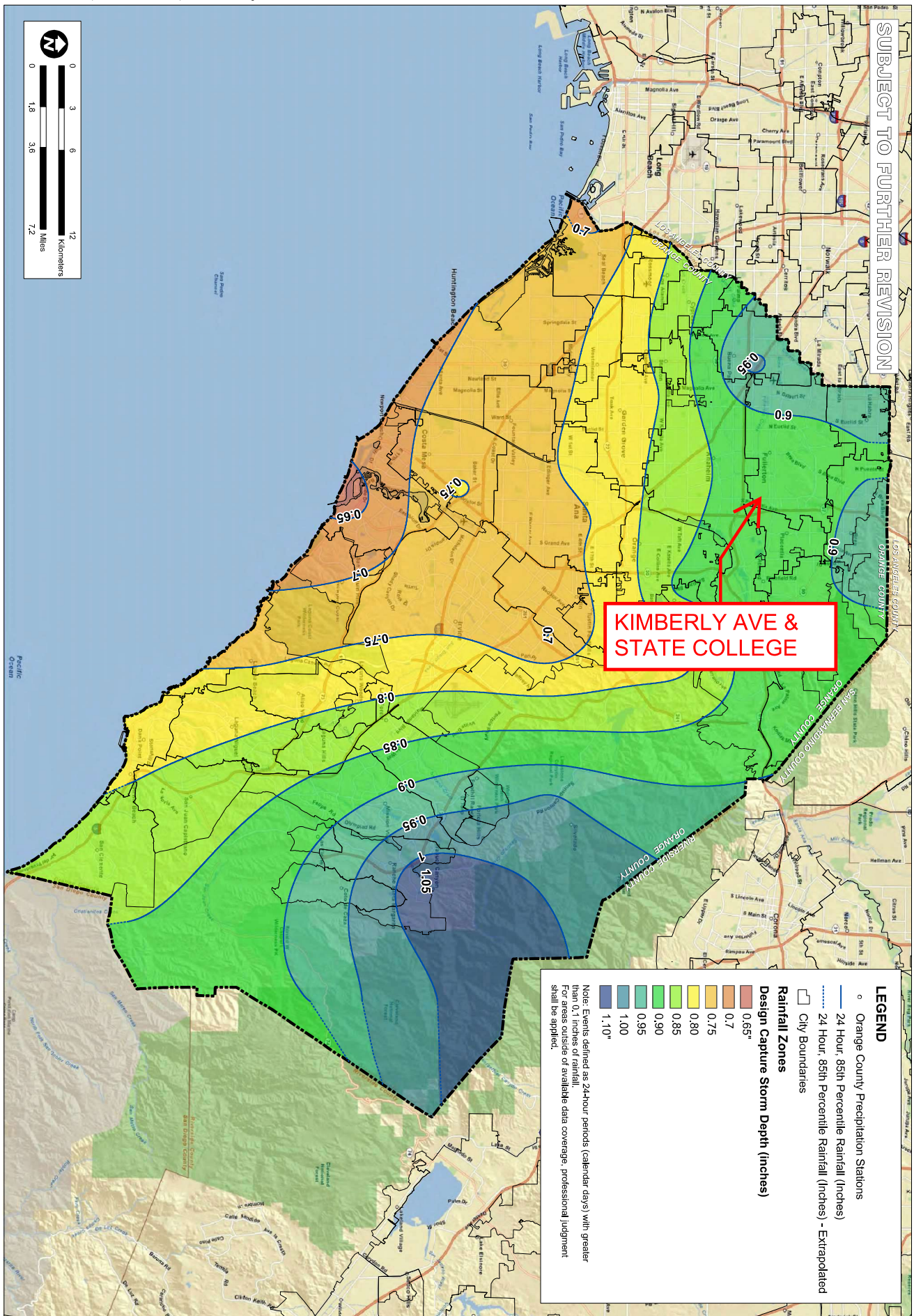
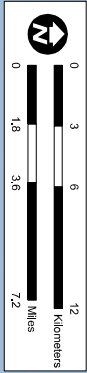
ABBREVIATIONS

- IC FINISHED GRADE
- PF PROPOSED FLOOR ELEVATION
- PE PROPOSED EXISTING FLOOR ELEVATION
- CF CONCRET FINISH
- MB MODULAR BUILDING SYSTEM

North Arrow

SCALE 1" = 30'

SUBJECT TO FURTHER REVISION



KIMBERLY AVE &
STATE COLLEGE

LEGEND

- Orange County Precipitation Stations
- 24 Hour, 85th Percentile Rainfall (Inches)
- 24 Hour, 85th Percentile Rainfall (Inches) - Extrapolated
- City Boundaries

Rainfall Zones

Design Capture Storm Depth (Inches)

- 0.65"
- 0.7
- 0.75
- 0.80
- 0.85
- 0.90
- 0.95
- 1.00
- 1.10"

Note: Events defined as 24-hour periods (calendar days) with greater than 0.1 inches of rainfall. For areas outside of available data coverage, professional judgment shall be applied.

FIGURE
XVI-1



SCALE	1" = 1.8 miles
DESIGNED	TH
DRAWING	TH
CHECKED	BMP
DATE	04/22/10
JOB NO.	9526-E

**ORANGE COUNTY
TECHNICAL GUIDANCE
DOCUMENT**

ORANGE CO. CA

TITLE
RAINFALL ZONES