City of El Paso de Robles
2013-2014 ANNUAL REPORT (Electronic Submittal)

General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer Systems (General Permit)

WDID: 3 40MS03019

City of El Paso de Robles
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Paso Robles, Ca 93446

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TABLE OF CONTENTS

2013-2014 Annual Report (SMARTS Submittal) ..... 1 – 14

CBSM Summary 2012 – 2014 ..... 15 – 17

MS4 Joint Effort: Report Tracking (SMARTS Submittal) ..... 18 – 21

Education and Outreach Accomplishments ..... 22 – 23

Post-Construction Interim LID Projects ..... 24 – 27

Post-Construction Requirements Annual Report (SMARTS Submittal) ..... 28 – 31

Post-Construction Requirement Form ..... 32 – 37

Performance Requirement No. 1: Technical Guidance ..... 38 – 87

Performance Requirement No. 1: PCR Template ..... 88 – 98

2013-2014

Phase II Small MS4 Annual - Report

REPORTING PERIOD:07/01/2013 - 06/30/2014

WDID No: 3 40M2000012

Permittee Information

CITY OF PASO ROBLES

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1000 SPRING STREET

PASO ROBL CA 93446

Phase II Small MS4 Annual - Report - 2013-2014

Questions & Answers

Q No.	Text	DropDown Answer	CheckBoxAnswer	DescriptiveAnswer	Date Answer	Number Answer
	GENERAL					
1	Per Section E.1., did you continue to implement your previously approved storm water management plan? If 'No', please provide a brief explanation in the comments section. (Years 1 - 5) (Please note: This question is for renewal permittees only. If you are a new permittee, please select 'NA')	Yes				
2	If you relied on another entity (co-permittee or SIE) to implement one or more of the permit requirements did the co-permittee or SIE meet the permit requirements that were implemented on your behalf? (Years 1 - 5) If 'Yes', please attach a copy of the agreement that you may have with the other entity. If 'No', please provide a brief explanation.	NA				
	PROGRAM MANAGEMENT					
3	Reviewed and/or revised any relevant ordinances or other regulatory mechanisms, or adopted any new ordinances or regulatory mechanisms to obtain adequate legal authority as specified by Section E.6.a.(ii)(a-j)? (pgs. 20-22, Year 2) If 'No', please provide a brief explanation in the comments section.	N/A				
4	Certified legal authority, as specified by section E.6.b.? (page 22, Year 2) If 'Yes", attach required statement signed by an authorized signatory certifying adequate legal authority to comply with all Order requirements. (E.6.b.(ii)(a-e), page 22). (Year 2) If "No", please provide a brief explanation.	N/A				
5	Developed and began implementation of Enforcement Response Plan as specified by Section E.6.c.(ii)(a-f)? (pgs. 22-24, Year 3) If 'No', please provide a brief explanation.	N/A				
	EDUCATION AND OUTREACH					
6	Selected one or more of the Public Education and Outreach options? (E.7.a, page 25.) (Year 1) If yes, which option was selected to comply with section E.7.? Provide answer in comments section. (Year 1) For countywide/regional collaborative option selection, upload required attachment: agreement confirming collaboration with other MS4s. (Year 1)	Yes		The City is fulfilling outreach and education requirements within our jurisidiction.		
7	Developed and began implementation of storm water public education and outreach program as specified by section E.7.a.(ii)(a - m)? (pgs. 25-27, Year 2) If 'No', please provide a brief explanation.	N/A				

8	Developed and implemented a public education strategy that established education tasks based on water quality problems, target audiences and anticipated task effectiveness? (E.7.a.(ii)a, page26) (Year 2) If 'No', please provide a brief explanation.					
9	Developed and implemented a training program for all staff who, as part of their normal job responsibilities, may be notified of, come into contact with, or otherwise observe an illicit discharge or illegal connection to the storm drain system, as specified by section E.7.b.1.(ii)(a-g), page 27) (Year 3) If 'NA', please provide a brief explanation.					
10	Provided construction outreach and education training for staff implementing construction site storm water runoff control program, as specified by section E.7.b.2.a(ii)(a-c), page 28 (Year 2) If 'NA', please provide a brief explanation.					
11	Developed and distributed educational materials to construction site operators, as specified by section E.7.b.2(b)(ii)(a-d), pgs. 28 - 29) (Year 3) If 'NA', please provide a brief explanation.					
12	Updated existing storm water website, as necessary, to include information on appropriate selection, installation, implementation and maintenance of BMPs? (E.7.b.2.(b)(ii)(d), page 29) (Year 3) If 'No', please provide a brief explanation.					
13	Trained employees on how to incorporate pollution prevention/good housekeeping techniques into Permittee operations, as specified by section E.7.b.3.(ii)(a-d), page 30 (Year 2) If 'NA', please provide a brief explanation.					
	PUBLIC INVOLVEMENT AND PARTICIPATION PROGRAM					
14	Involved the public in the development and implementation of activities related to the program, as specified by section E.8.(ii)(a-e)? (Year 2) If 'No', please provide a brief explanation.					
	ILLICIT DISCHARGE DETECTION AND ELIMINATION					
15	Created and maintained outfall map? (E.9.a., page 31) (Year 2) If 'No', please provide a brief explanation.					
16	Included in the outfall map, location of all outfalls that are operated by the Permittee within the urbanized area, drainage areas, and land use(s) contributing to those outfalls that are operated by the Permittee, and that discharge within the Permittee's jurisdiction to a receiving water? (E.9.a(ii)(a), page 31) (Year 2) If 'No', please provide a brief explanation.					

17	Included in the outfall map, the location (and name, where known to the Permittee) of all water bodies receiving direct discharges from those outfall pipes? (E.9.a(ii)(b), page 31) (Year 2) If 'No', please provide a brief explanation.					
18	Included in the outfall map, priority areas, as specified in E.9.a.(ii)(c)(1-8), pages 31 -32. (Year 2) If 'No', please provide a brief explanation.					
19	Included in the outfall map, field sampling stations? (E.9.a(ii)(d), page 32) (Year 2) If 'No', please provide a brief explanation.					
20	Included in the outfall map, the permit boundary? (E.9.a(ii)(e), page 32) (Year 2) If 'No', please provide a brief explanation.					
21	Maintained inventory of all industrial/commercial facilities/sources within the Permittee's jurisdiction (regardless of ownership) that could discharge storm water pollutants to the MS4? (E.9.b., page 32) (Year 2) If 'No', please provide a brief explanation.					
22	Included in the inventory, the facility name, address, nature of business/activity, physical location of storm drain receiving discharge, name of receiving water and if the facility/source is tributary to a Clean Water Act Section 303(d) listed water body segment or water body segment subject to a TMDL? (E.9.b(ii)(a), page 32) (Year 2) If 'No', please provide a brief explanation.					
23	Included in the inventory: vehicle salvage yards, metal and other recycled materials collection facilities, waste transfer facilities, vehicle mechanical repair, maintenance or cleaning; building trade central facilities or yards; corporation yards; landscape nurseries and greenhouses; building material retailers and storage; plastic manufacturers; other facilities designated by the Permittee or Regional Water Board to have reasonable potential to contribute to pollution of storm water runoff? (E.9.b(ii)(b), page 33) (Year 2) If 'No', please provide a brief explanation.					
24	Determined if facilities that are required to be covered under the Statewide Industrial General Permit (IGP) have done so and notified Regional Water Board of any non-filers? (E.9.b(ii)(c), page 33) (Year 2) Attached copies of the notification of non-filers to the Regional Water Board (E.9.b(ii)(c)page 33) (Year 2) If 'No', please provide a brief explanation.					
25	Updated the inventory annually? (E.9.b(ii)(d), page 33) (Year 2) If 'No', please provide a brief explanation.					

26	Developed and implemented procedures to proactively identify illicit discharges originating from priority areas identified in Section E.9.a.(ii)(c), at least once over the length of the permit term. OR, established a self-certification program where Permittees require reports from authorized parties demonstrating the prevention and elimination of illicit discharges at their facilities in priority areas at least once over the length of the permit term? (E.9.b(ii)(e), page 33) (Year 2) If 'No', please provide a brief explanation.					
27	Conducted field sampling of any outfalls that were flowing or ponding when it had been more than 72 hours after the last rain event (i.e., were suspected of illicit discharges) during outfall mapping inventory (under section E.9.a., page 31)? (E.9.c., page 34) (Year 2) If 'No', please provide a brief explanation.					
28	Conducted monitoring for the parameters listed in Table 1 (page 34), or for parameters selected by Permittee based on local knowledge of pollutants of concern? (E.9.c(ii)(a), page 34) (Year 2) If tailored parameter action levels, attach justification and modifications to parameters If 'No', please provide a brief explanation.					
29	Verified that indicator parameter action levels in Table 2 (page 35), or tailored parameter action levels were not exceeded? (E.9.c.(ii)(b), page 35) (Year 2) If tailored parameter action levels, attach justification and modifications to parameter action levels. If 'No', please provide a brief explanation.					
30	Conducted follow-up investigations per Section E.9.d. if the action level concentrations were exceeded? (E.9.c(ii)(c), page 35) (Year 2) If 'No', please provide a brief explanation.					
31	Developed written procedures for conducting investigations into the source of all suspected illicit discharges? (E.9.d.ii(a-e), page 36) (Year 2) If 'No', please provide a brief explanation.					
32	Investigated within 24 hours, non-storm water discharges suspected of being sanitary sewage and/or significantly contaminated? (E.9.d.(ii)(a), page 36) (Year 2) If 'No', please provide a brief explanation.					
33	Prioritized investigations of suspected sanitary sewage and/or significantly contaminated discharges over investigations of non-storm water discharges suspected of being cooling water, wash water, or natural flows? (E.9.d.(ii)(b), page 36) (Year 2) If 'No', please provide a brief explanation.					
34	Reported immediately the occurrence of any flows believed to be an immediate threat to human health or the environment to local Health Department? (E.9.d.(ii)(c), page 36? (Year 2) If 'No', please provide a brief explanation.					

35	Determined and documented through investigations the source of all non-storm water discharges? (E.9.d.(ii)(d), page 36) (Year 2) If 'No', please provide a brief explanation.					
36	Implemented corrective actions to eliminate illicit discharges as specified in section E.9.d.(ii)(e), page 36. (Year 2) If 'No', please provide a brief explanation.	N/A				
37	Developed and implemented a spill response plan? (E.9.e., page 36) (Year 1) If 'No', please provide a brief explanation.	Yes				
	CONSTRUCTION SITE STORM WATER RUNOFF CONTROL PROGRAM					
38	Developed an enforceable construction site storm water runoff control ordinance for all projects that disturb less than one acre of soil? (E.10., page 37) (Year 2) If 'No', please provide a brief explanation.	N/A				
39	Created, maintained, and continuously updated an inventory of all projects subject to local construction site storm water runoff control ordinance according to the minimum requirements listed in section E.10.a(ii)(a-h) ? (E.10.a., page 37) (Year 1) If 'No', please provide a brief explanation.	Yes				
40	Developed procedures that include the minimum requirements listed in section E.10.b(ii)(a-e) to review and approve construction plan documents? (i.e., erosion and sediment control plans). (E.10.b., page 38) (Year 1) If 'No', please provide a brief explanation.	Yes				
41	Used legal authority to implement procedures for inspecting public and private construction projects and conducted enforcement as necessary? (E.10.c, page 39). (Year 2) If 'No', please provide a brief explanation.	N/A				
42	Conducted inspections, at a minimum, at priority construction sites prior to land disturbance, during active construction and following active construction? (E.10.c.(ii), page 39) (Year 2) If 'No', please provide a brief explanation.	N/A				
43	Included in inspection, an assessment of compliance with the Permittee's construction site storm water control ordinance and other applicable ordinances? (E.10.c., page 39) (Year 2) If 'No', please provide a brief explanation.	N/A				
44	Active site inspections included inspections of BMP maintenance, BMP effectiveness and verification of no pollutant of concern discharge? (E.10.c.(ii), page 39) (Year 2) If 'No', please provide a brief explanation.	N/A				

45	Based inspection prioritization criteria on project threat to water quality (includes soil erosion potential, site slope, project size and type, sensitivity of receiving water bodies, proximity to receiving water bodies, non-storm water discharges, projects more than one acre that are not subject to the CGP and past record of non-compliance)? (E.10.c.(ii), page 39) (Year 2) If 'No', please provide a brief explanation.					
	POLLUTION PREVENTION/GOOD HOUSEKEEPING FOR PERMITTEE OPERATIONS PROGRAM					
46	Developed and maintained an inventory of Permittee-owned or operated facilities within your jurisdiction that are a threat to water quality, as specified in E.11.a(ii), page 40. (Year 2) If 'No', please provide a brief explanation.					
47	Developed and submitted a map that identifies the location of inventoried Permittee-owned/operated facilities, storm drainage system corresponding to the each of the facilities and the receiving water, facility name and management including contact information? (E.11.b., page 41) (Year 2) If 'No', please provide a brief explanation.					
48	Developed and implemented SWPPPs for hotspots as specified in section E.11.d.(ii)(a-c), page 42-43)? (Year 4) If 'No', please provide a brief explanation.					
49	Conducted quarterly visual inspection of hotspots and hotspot discharge locations? (E.11.e.(ii)(a and c), page 43) (Year 5) If 'No', please provide a brief explanation.					
50	Conducted annual comprehensive hotspot inspection? (E.11.e(ii)(b), page 43) (Year 5) If 'No', please provide a brief explanation.					
51	Inspected each inventoried facility that is not a hotspot once during permit term? (E.11.e(ii)(d), page 44) (Year 5) If 'No', please provide a brief explanation.					
52	Implemented procedures to assess and prioritize maintenance of storm drain system infrastructure and assigned a high priority to each catch basin meeting any of the criteria listed in section E.11.f(ii)(1-5), page 44? (Year 2) If 'No', please provide a brief explanation.					
53	Began maintenance of storm drain systems according to the procedures and priorities developed according to section E.11.g.(ii)(a-e), page 45? (Year 3) If 'No', please provide a brief explanation.					
54	Developed and implemented a strategy to inspect storm drain systems, based on the priorities assigned in section E.11.f.(ii), page 44. (E.11.g.(ii)(a), page 45). (Year 3) If 'No', please provide a brief explanation.	N/A				

55	Developed and implemented a schedule to clean high priority catch basins and other systems? (E.11.g.(ii)(b), page 45) (Year 3) If 'No', please provide a brief explanation.	N/A				
56	Ensured that each catch basin in high foot traffic areas includes a legible storm water awareness message? (E.11.g.(ii)(c), page 45) (Year 3) If 'No', please provide a brief explanation.	N/A				
57	Reviewed and maintained high priority facilities and removed trash and debris from high priority areas prior to the rainy season? (E.11.g.(ii)(d), page 45). (Year 3) If 'No', please provide a brief explanation.	N/A				
58	Developed and maintained a procedure to dewater and dispose of materials extracted from catch basins that ensures that water removed during the catch basin cleaning process and waste material will not reenter the MS4? (E.11.g.(ii)(e), page 45). (Year 3) If 'No', please provide a brief explanation.	N/A				
59	Developed program to assess O&M activities for potential to discharge pollutants and inspected all O&M BMPs quarterly as specified in section E.11.h.(ii)(a-d), page 45-46? (Year 3) If 'No', please provide a brief explanation.	N/A				
60	Developed and implemented a program that includes activities listed in section E.11.h.ii(a)(1-8), page 46, to assess O & M activities and subsequently developed applicable BMPs? (E.11.h(ii)(a), page 46) (Year 3) If 'No', please provide a brief explanation.	N/A				
61	Identified all materials that could be discharged from each of these O&M activities, and which materials contain pollutants? (E.11.h(ii)(b), page 46) (Year 3) If 'No', please provide a brief explanation.	N/A				
62	Developed and identified a set of BMPs that, when applied during Permittee O&M activities, will reduce pollutants in storm water and non-storm water discharges? (E.11.h(ii)(c), page 46) (Year 3) If 'No', please provide a brief explanation.	N/A				
63	Evaluated all BMPs implemented during O&M activities quarterly? (E.11.h(ii)(d), page 46) (Year 3) If 'No', please provide a brief explanation.	N/A				
64	Developed and implemented a process for incorporating water quality and habitat enhancement into new and rehabilitated flood management projects? (E.11.i, page 46-47) (Year 3) If 'No', please provide a brief explanation.	N/A				
65	Implemented a landscape design and maintenance program to reduce the amount of water, pesticides, herbicides and fertilizers used by Permittee? (E.11.j., page 47) (Year 2) If 'No', please provide a brief explanation.	N/A				

66	Evaluated pesticides, herbicides and fertilizers used and application activities performed and identified pollution prevention and source control opportunities? (E.11.j(ii)(a), page 47) (Year 2) If 'No', please provide a brief explanation.	N/A				
67	Implemented practices that reduced the discharge of pesticides, herbicides and fertilizers as specified in section E.11.j(ii)(b)(1-4), page 47-48)? (Year 2) If 'No', please provide a brief explanation.	N/A				
68	Implemented educational activities for municipal applicators and distributors? (E.11.j(ii)(b)(1), page 47) (Year 2) If 'No', please provide a brief explanation.	N/A				
69	Implemented landscape management measures that rely on non-chemical solutions, including the measures specified in section E.11.j.(ii)(b)(2)(a-i), page 47? (Year 2) If 'No', please provide a brief explanation.	N/A				
70	Collected and properly disposed of unused pesticides, herbicides and fertilizers? (E.11.j(ii)(b)(3), page 48)(Year2) If 'No', please provide a brief explanation.	N/A				
71	Minimized irrigation runoff by using an evapotranspiration-based irrigation schedule and rain sensors? (E.11.j(ii)(b)(4), page 48), (Year 2) If 'No', please provide a brief explanation.	N/A				
72	Recorded the types and amounts of pesticides, herbicides and fertilizers used in the permit area? (E.11.j(ii)(c), page 48) (Year 2) If 'No', please provide a brief explanation.	N/A				
	POST CONSTRUCTION STORMWATER MANAGEMENT PROGRAM					
73	Regulated development to comply with sections E.12.b. through E.12.l of permit? (E.12.a., page 48) (Year 2) If 'No', please provide a brief explanation.	N/A				
74	Required implementation of site design measures for all projects that create and/or replace 2,500- 5,000 square feet of impervious surface (including single family homes, that are not part of a larger plan of development)? (E.12.b., page 48-49) (Year 2) If 'No', please provide a brief explanation.	N/A				
75	Implemented standards, including measures for site design, source control, runoff reduction, storm water treatment and baseline hydromodification management, on projects that create and/or replace more than 5,000 square feet of impervious surface (Regulated Projects)? (E.12.c., pages 49 -51) (Year 2) If 'No', please provide a brief explanation.	N/A				
76	Regulated Projects implemented source control measures? (E.12.d., page 51- 52) (Year 2) If 'No', please provide a brief explanation.	N/A				

77	Regulated Projects implemented LID standards designed to reduce runoff, treat storm water, and provide baseline hydromodification management to the extent feasible, to meet the Numeric Sizing Criteria for Storm Water Retention and Treatment under section E.12.e(ii)c., page 53. (E.12.e., page 52-56)? (Year 2) If 'No', please provide a brief explanation.	N/A				
78	Developed and implemented hydromodification management procedures for Regulated Projects that created and/or replaced one acre or more of impervious surface as specified by section E.12.f? (pgs. 56 - 57, Year 3) If 'No', please provide a brief explanation.	N/A				
79	Developed and/or modified enforceable mechanisms to implement E.12.b and E.12.f. (E.12.g., page 58) (Year 3) If 'No', please provide a brief explanation.	N/A				
80	Implemented an O&M verification program for storm water treatment and baseline hydromodification structural controls measures on all Regulated Projects, as specified by section E.12.h.(ii)(a-e), page 58-60? (Year 2) If 'No', please provide a brief explanation.	N/A				
81	Inventoried and assessed the maintenance condition of structural post-construction BMPs within your jurisdiction? (E.12.i., page 60) (Year 3) If 'No', please provide a brief explanation.	N/A				
82	Developed and maintained a plan to inventory, map and determine the relative maintenance condition of structural post-construction BMPs as specified by section E.12.i(ii)(a-d), page 60-61? (Year 3) If 'No', please provide a brief explanation.	N/A				
83	Conducted an analysis of the landscape code to correct gaps and impediments impacting effective implementation of post-construction standards? (E.12.j(ii)(a), page 61) (Year 1) If 'No', please provide a brief explanation.	Yes				
84	Completed any changes to the landscape code to effectively administer post-construction requirements? (E.12.j(ii)(b), page 61) (Year 2) If 'No', please provide a brief explanation.	N/A				
85	Implemented post-construction storm water management requirements based on a watershed-process approach as specified by section E.12.k, page 62? (Years 1 - 5)	Yes				
86	Proposed alternative post-construction requirements that achieved multiple-benefits as specified by section E.12.l., page 62? (Years 1 - 5)	Yes				
	WATER QUALITY MONITORING					
87	Indicate which water quality monitoring approach applies to your jurisdiction. Check all that apply.		303(d) Monitoring			

88	If you selected TMDL Monitoring or 303(d) Monitoring, did you consult with your Regional Water Board within Year 1 of the permit to determine monitoring study design and implementation schedule? If 'No', please provide a brief explanation.	YES				
89	Indicate if you are or will be conducting water quality monitoring individually or as part of a regional program. (Years 1 and 2) If regional program, list the name of the program in the text box below.		Individually			
90	Provide a status update regarding the development (including consultation with Regional Boards, if applicable), submittal and/or approval of the monitoring study design and implementation schedule. (Year 1)			The City met with the RWQCB on May 8, 2014 and it was determined that the City does not have to conduct 303(d) monitoring.		
91	Upload the Monitoring Study Design and any available results for the monitoring option that applies to your jurisdiction. (Year 2)					
92	Provide a summary of the implementation of the water quality monitoring program and related results. (Year 3 - 5) Upload the Monitoring Study Results.					
	PROGRAM EFFECTIVENESS ASSESSMENT					
93	Developed and implemented a Program Effectiveness Assessment and Improvement Plan (PEAIP) that includes the minimum requirements listed in section E.14.a(ii)(a-f), page 70-72)? (Year 2) If 'No', please provide a brief explanation. If 'Yes', upload required PEAIP as attachment.	N/A				
94	Provide a description of implementation of the Program Effectiveness and Implementation Plan, a summary of data obtained through effectiveness assessment measures and the short and long-term progress of the storm water program and an analysis of the data as described on page 72 of the permit. Upload as an attachment. (Years 3 - 5)					
95	Identified and summarized BMP and/or program modification identified in priority program areas that will be made in next permit term? (E.14.b.(ii)(a-d), page 72-73) (Year 5) If 'No', please provide a brief explanation. If 'yes', upload required PEAIP as attachment.	N/A				
	TOTAL MAXIMUM DAILY LOADS COMPLIANCE REQUIREMENTS					
96	Attached TMDL implementation status report that includes the information listed in section E.15.d(i-iv), page 74 of permit? If 'No', please provide a brief explanation.	NA				
	ADDITIONAL INFORMATION					

97	Optional: If you have any additional information, reports or attachments that you would like to provide to describe your storm water program please use the text box and/or the upload attachment button below. (Years 1 - 5)			CBSM Summary for 2013 - 2014 reporting year per the May 3, 2014 letter from the Central Coast Regional Water Quality Control Board.		

Phase II Small MS4 Annual - Report - 2013-2014

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualilfied personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that threre are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Patti Gwathmey	**Title:**	**Date: 10/08/2014**

Phase II Small MS4 Annual - Report - 2013-2014

ATTACHMENTS

Attachment Title	Description	Date Uploaded	Attachment Type	Attachment Hash	Doc Part No/Total Parts
CBSM Summary 2013-14	Summary of CBSM Activities to fulfill the CBSM requirements in the May 3, 2013 letter from the RWQCB.	2014-10-08 12:38:48.0	Report Question Attachment	a26b7539704a8ac51a94caa8ff89f3b118d3f4357719b2a17fc4e9b050bbb32	1/1

CBSM Summary
For
Traditional MS4s in San Luis Obispo County
(SLO County, Cities of San Luis Obispo, Arroyo Grande, Pismo Beach, Grover Beach, Morro Bay, Atascadero, and Paso Robles)
2012-2014

The eight traditional MS4s in the County of San Luis Obispo (Group) have agreed to do a Countywide CBSM pilot project in order to share resources and provide a consistent message throughout the County.

Pilot Program: Dog Waste

Target Audience: Dog owners of all ages

Program Slogan: SLO Scoops Poop

Draft Pilot Program:

- A public education booth was developed for educating the public on the importance of picking up dog waste.
- Literature review was done to determine barriers and how to get the public to pick up after their dogs at home and in public.
- A survey was developed to determine the barriers. Surveys are taken at various events when the booth is used and answers are tabulated.
- Each MS4 will pick a location within their jurisdiction where abandoned dog waste is an issue.

- Flags will be set out to mark abandoned dog waste in order to bring attention to the amount of abandoned dog waste.
- Signs to be placed along each pilot location to alert the public of the project and issues and concerns with not picking up dog waste.
- Website to be developed in fall of 2014.

Accomplishments in October 2012– June 30, 2014

October 18, 2012: the Group decided to look into doing a regional CBSM Program. We requested a proposal from the Upper Salinas Las Tablas Resource Conservation District (RCD).

February 21, 2013: Received the first CBSM Proposal from the RCD.

April 17, 2013: Received a revised proposal from the RCD and one from Verdin Marketing.

May 3, 2013: Letter from the RWQCB detailing the requirements for the CBSM Pilot Program.

July 18, 2013: The Group discussed possible pilot projects and chose three –Got Ants?, Dog Waste, Trash.

July 31, 2013: Three of the Group members met the RWQCB staff to discuss Verdin's CBSM Proposals. The Group was advised to pick only one topic for the pilot program.

August – November 2013: The Group discussed different options for a CBSM program and decided to explore a pilot program associated with the Green Gardener Program. Starting a Green Gardener Program was investigated and determined to be cumbersome and expensive. Other ideas such as trash and the Our Water Our World program were explored.

February 20, 2014: The Group decided to focus on dog waste as the countywide pilot program as it is a problem common to all the communities.

March 12, 2014: CBSM Workshop presented by Stephen Groner Associates at the SLO County Library. The Workshop was arranged by SLO County.

March 2014: The Dog Waste booth was created by the City of Paso Robles.

March 20, 2014: A strategic planning discussion was held at the monthly Central Coast Partners for Water Quality meeting on implementation.

April 17, 2014: Continued discussion on strategies for implementing the pilot program at the Partners meeting. The Group decided to implement the program on our own, instead of hiring a consultant.

May 15, 2014: A subcommittee of the Group met to discuss surveys, program participation, and other items such as giveaways and signage. Researched other CBSM programs on dog waste and discussed implementation methods that we could use in our County.

June 19, 2014: The Group continued the implementation discussion for the pilot program.

Events Where the Dogs have Appeared

Although the Group had not formalized the pilot program, our research on implementing a CBSM campaign indicated that we needed to survey the public to determine barriers to the desired behavior. Therefore, we began attending events and surveying the public.

March 22, 2014: The dog booth made its premiere at the Parks4Pups Dog Jog in Paso Robles. Booth was staffed by the City of Paso Robles and the County of SLO.

April 19, 2014: Shandon Community Day, staffed by County and City of Paso Robles.

April 22, 2014: Business Expo, City of Paso Robles, staffed by the City of Paso Robles and the City of SLO.

April 26, 2014: State of the Bay, Dog Fest, staffed by City of Morro Bay and County.

April 27, 2014: Earth Day at El Chorro Regional Park, staffed by County.

May 10. 2014: Outdoor Discovery Day at Lopez lake, staffed by County.

June 1, 2014: Green Light Eco Faire at St Timothy's Church Hall, staffed by City of Morro Bay

June 7, 2014: Fire Hydrant 5k: Pismo Beach, staffed by City of Pismo Beach and County.

2013-2014

Phase II Small MS4 Once - Report

REPORTING PERIOD:07/01/2013 - 03/06/2014

WDID No: 3 40M2000012

Permittee Information

CITY OF PASO ROBLES

Patti Gwathmey

pgwathmey@PRCITY.COM

1000 SPRING STREET

PASO ROBL CA 93446

Phase II Small MS4 Once - Report - 2013-2014

Questions & Answers

Q No.	Text	DropDown Answer	CheckBoxAnswer	DescriptiveAnswer	Date Answer	Number Answer
1	Did the Permittee upload a Tracking Report, for the period 3/31/11 through 3/6/14, identifying the Permittee's accomplishments in education and outreach supporting implementation of low impact development and hydromodification control for new and redevelopment projects?	yes		Tracking Report for PC Education & Outreach Accomplishments (attached)		
2	Did the Permittee upload a Tracking Report, for the period 1/1/11 to 3/6/14, identifying low impact development design principles and features incorporated into each applicable new and redevelopment project?	yes		Tracking Report for PC Interim LID Projects (attached)		

Phase II Small MS4 Once - Report - 2013-2014

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualilfied personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that threre are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Patti Gwathmey	**Title:**	**Date: 10/08/2014**

Phase II Small MS4 Once - Report - 2013-2014

ATTACHMENTS

Attachment Title	Description	Date Uploaded	Attachment Type	Attachment Hash	Doc Part No/Total Parts
Tracking for Interim LID Projects		2014-10-08 17:12:03.0	Report Question Attachment	be4db734a18c79b57b415e4d6d8810e9bc7e7bcfff3cdbb6ccabc53627b2	1/1
Tracking Report for PC Education & Outreach Accomplishments	able of PC Education and Outreach for the period from March 31, 2011 to March 6, 2014	2014-10-08 14:36:43.0	Report Question Attachment	cc73f23326129e23f5bccdf0aceff269dd19cbed768c2b2369ede862886bcd11	1/1

Education and Outreach Accomplishments Supporting Implementation of LID and Hydromodification March 31, 2011 – March 6, 2014		
2011	Web site on Post Construction expanded with interim criteria, LID reference manuals, and other LID BMPs for individual residential lots.	Developers, Architects, Engineers, Residents
04/29/11	Developed Interim LID Guidelines (trifold brochure) with the Hydromodification TAC. Placed the brochure on the City's website & handed out with all grading permits applications	Developers, Architects, Engineers, Residents
6/16/11	Complete Green Street Workshop. Paso hosted.	Municipalities, Developers, Engineers, Architects
6/24/11	Meet with Darla & Melanie to develop the Parking Lot TAM. Parking Lot Tam available at City Hall and on the web site.	City Staff
2/6/12	Discussion on LID and Zoning Code Changes with Community Development Staff	City Staff
2/16/12	RWQCB Hydromodification Criteria Workshop in Santa Maria.	City Staff
2/29/12	Center for Watershed Protection: Retrofit This Webinar. J Falkenstien, Ditas Esperanza, Patti Gwathmey	City Staff
3/15/12	Center for Watershed Protection: Advancing Local Sustainability Through Improved Storm water Management Webinar. Paso hosted, attended by County & City of SLO, Paso SW staff.	City Staff

4/18/12	Center for Watershed Protection: Build This-Retrofit Webinar. D. Esperanza, J. Falkenstien, M. Thompson, Morro Bay, County of SLO. Paso hosted	City Staff
6/20/12	Stream Restoration Webinar, City of SLO, P. Gwathmey, local condo owner.	City Staff, residents
12/12/12	Center for Watershed Protection: Customizing Your Stormwater BMP Design for Pollutants Webinar. County & City of SLO, Cal Poly, Paso. Paso Hosted	City Staff
1/9/13	LID discussion with Community Development.	City Staff
3/4/13	LID Ad Hoc Meeting. Councilman Strong, Mayor Picanco, J. Falkenstien, P. Gwathmey, S. Decarli, City Manager J. App	City Staff
3/15/13	RWQCB Post Construction Meeting with City staff	City Staff
3/26/13	The City held a workshop on LID & Post Construction Requirements at a Joint City Council and Planning Commission meeting. The public, contractors, engineers, and architects were invited. A PowerPoint presentation was given by Rick Engineering. All attendees received a copy of the 2012 approved PCRs and the LID Plant Guidance for Bio-Retention.	There were 21 attendees including 7 planning commissioners, 5 City Council Member, developers, architects, representatives from several engineering firms, and a few residents
4/23/13	The City hosted a booth at the Business Expo which is attended by residents and businesses. The City had a display on LID and handed out information on LID including the LID Plant Guidance for Bioretention, "*Slow it. Spread it. Sink it! A homeowners guide to Greening Stormwater Runoff*"	Residents and businesses.
1/9/14	PCR Workshop in Santa Maria. J. Falkenstien & P. Gwathmey.	City Staff

Interim LID Projects

PROJECT NAME	Project Address	PROJECT DESCRIPTION	Project Completed	LID Features	Impermeable surface (sq ft)	Acres
Buena Vista Apartments	Experimental Station Road west of Buena Vista Drive	142 apartment units approved by the planning commission on June 4, 2013.	No permits have been issued to date	Bio-swales, retention planters, detention basins	6.27 acres	12.5
Vernon	514 38th Street	14 unit townhouse residential subdivision	No permits have been issued to date	Open retention basin and underground retention basin	in paper file	8
Firestone Brewery	1400 Ramada Drive	Packaging Hall, keg and glass shed, loading docks, guard building, parking lot and bottling building approved by Planning Commission November 13, 2012.	Most work complete, bottling building under construction	Reconstruction of existing concrete lined storm drain channel to perforated pipe encased in rock for infiltration purposes. Removal of stormwater concrete open channel for infiltration purposes. Installation of retention basin.	1.5 acres	1.9 ac
Ayers Hotel	Northeast corner of Buena Vista Drive at Experimental Station Road	225 room resort hotel. The project was approved by City Council on July 17, 2012.	Under construction	Bio-retention swales and retention basins	7.6 acres	20 ac
Vina Robles	3700 Mill Road	60- room hotel, 10 duplex-bungalow lodging units, 3,300 seat amphitheatre and ancillary buildings. The project was approved by the Planning Commission on August 9, 2011.	Yes	Infiltration trenches and retention basins	2.0 acres	14.4 ac
IQMS	Wisteria	30,000 sf office building approved by the Planning Commission on April 24, 2012.	Yes	Bioswales and underground infiltration system.	1.5 acres	3.5 ac
Mid Valley Steel	Northeast corner of Tuley Road and Union Road	32,000 sf light industrial building approved by the Planning Commission on April 10, 2012. 4.5 acres. 33,000 sq ft bldg.	Yes	Retention basins	3.0 acres	4.5 ac
Golden Oaks/Marshal Apartment Complex	Creston Rd	5-unit apartment complex approved by the Planning Commission on February 28, 2012.	No permits have been issued to date	Retention basin proposed	17,000 sf	1.0 ac

Interim LID Projects

PROJECT NAME	Project Address	PROJECT DESCRIPTION	Project Completed	LID Features	Impermeable surface (sq ft)	Acres
Highlands Church	Oak Hill Road	7,000 sf building addition to existing church approved by the Development Review Committee on March 12, 2012.	Yes	not yet determined	~7,000 sf	3.0 ac
Santa Cruz Biotech	Dry Creek Road	This project was approved by the DRC on January 23, 2012. A new 25,000 square foot building will be built on the existing 25 acre property.	Yes	Retention Basin	1.67 ac	25 ac
Applied Technologies	Buena Vista Drive	24,000 square foot light industrial and warehouse building addition.	Yes	Retention basin	~24,000 sf	1.46 ac
Justin Winery	Wisteria Lane	86,000 sf wine processing and barrel storage facility approved by the Planning Commission on September 27, 2011.	Yes	Retention basin	~86,000 sf	18 acres
Ferguson (Tract 3034)	Creston Road	Eight lot single family residential subdivision.	Yes	Retension basin	~.75 ac	1.0 acre
Derby Wine Estates	Riverside Avenue	Redevelopment of the Almond Growers Association Building at 525 Riverside Avenue into a wine processing facility approved by the Planning Commission on February 22, 2011.	Yes	Bio-swale and retention basin	~.5 ac	1.2 ac
Paso Robles Recreational Vehicle Resort	Golden Hill Road	332 space RV park approved by the Planning Commission on February 14, 2012.	No permits have been issued to date	Bio-swales, retention planters and retention basin	in paper file	73 ac
Paso Robles Horse Park	Hughes Parkway	Horse jumping event center approved by the Planning Commission on January 24, 2012. Project includes non-permanent stables, arenas, barn, office, rv spaces and parking lot.	Project under construction	Very limited impervious surfaces self mitigated to landscape areas.	in paper file	67 ac
Furlotti Annexation	South Vine Street	Proposed annexation of 269 acres on the northwest quadrant of South Vine and Highway 46 West. Application includes development plans for three hotels, two commercial centers, limited residential,open space and agriculture.	This application has been terminated	N/A	N/A	N/A

Interim LID Projects

PROJECT NAME	Project Address	PROJECT DESCRIPTION	Project Completed	LID Features	Impermeable surface (sq ft)	Acres
Paso Robles Wastewater Treatment Plant (WWTP) Upgrade	North of Highway 46E	Reconstruction of the WWTP includes full reconstuction of all existing facilities and new new building construction.	Project under construction	Stone recharge beds, pervious pavement, bio-swales and vegetated filter strips	in paper file	12 ac
Tract 2654	South River Road	26 unit multi-family project approved by the Planning Commission on October 25, 2005.	No permits have been issued to date	Bio-retention basins planned in the S. River Road right-of-way	in paper file	2.80 ac
La Quinta Hotel Expansion	Buena Vista Drive	37 room expansion to an existing hotel approved by the Planning Commission on April 12, 2011.	The project is under construction.	Underground retention basin	.37 ac	5.1 ac
North County Christian Church	9th Street	16,500 sf paved parking lot.	Yes	Permeable pavers in the alley.	~16,500 sf	1 ac
Hogue Grips	Linne Road	20,000 sf industrial building and paving addition	Yes	Retention basin	~ 20,000 af	2 ac
Winery Row	2550 Dry Creek Road	14 small winerys on lots varying in size from 36,000 to 42,000 sf approved by the Planning Commission on August 11, 2009	No permits have been issued to date	Tract 2772 has been designed with stormwater quality biofiltration areas	~42,000 sf	7 ac
Paso Robles Athletic Club	Union Road	Clubhouse, tennis courts, swimming pool approved by Planning Commission on March 27, 2007	Under construction	Retention basins	in paper file	18 acres
Spa/Office Building	12th Street	8,900 sf two-story building approved by Planning Commission on June 10, 2008.	No permits have been issued to date	Biofiltration areas	~9,000 sf	9,500 sf
Oak Park Redevelopment Housing	Park Street from 28th Street to 34th Street	Redevelopment of the Oak Park Housing Project approved by Planning Commssion on June 1, 2010.	Under construction in phases	Pervious concrete and underground retention	in paper file	20.3 acres
Commercial-Residential redevelopment	North Spring Street	20, 500 sf of commercial space, 28 single family homes and 14 residential condominium units replaced existing auto dealership approved by the Planning Commission on July 9, 2013.	No permits have been issued to date	Bioswales and treeplanter filtration systems	~20,500 sf	2.34 acres
Oxford Suites	4th Street at Pine Street	127-room hotel approved by Planning Commission on January 14, 2014.	No permits have been issued to date	Filtration planters and underground retention	in paper file	2.5 acres
Mullahey Auto Dealership	Golden Hill Road at Tractor Way	29,900 sf show room and dealership approved by Planning Commission on January 28, 2014	No permits have been issued to date	Filtration planters and discharge to City-maintained retention basin	~29,900 sf	3.6 acres

Interim LID Projects

PROJECT NAME	Project Address	PROJECT DESCRIPTION	Project Completed	LID Features	Impermeable surface (sq ft)	Acres
Residential Care Facility	725 Pine Street	15 bed 10,000 sf residential care facility approved by Planning Commission on January 14, 2014	No permits have been issued to date	Underground retention basin	~10,000 sf	0,5 acres
Pet Hospital Building addition and parking area	825 24th Street	1,800 sf building addition, 6,000 sf parking improvement Permit issued June, 2012	Yes	Bio-retention basins	~7,800 sf	1.1 acres
Commercial Tenant Improvement	2800 Riverside Avenue	Rehabilitate existing 120,000 sf parking lot Permit issued June 2012	Yes	Vegetated swale and infiltration trench	120,000 sf	5.1 acres
Paso Robles Golf Club	1600 Country Club Drive	Cart Barn and cart path improvements Permit issued June 2012	Yes	All runoff from impervious surfaces sheet flows to landscape areas larger than the impervious surfaces	5,000 sf	107.69 ac
Mixed Use building	1213 Vine Street	4,000 sf two-story building with parking lot. Permits approved in March, 2012	No permits have been issued to date	Biofiltration Areas/Watershed Plan	5,500 sf	7,000 sf
Compressed Natural Gas Fueling Station and expansion of Paso Robles Waste yard	3529 Combine Way	62,600 sf of site development permit approved on August, 2013.	Yes	Infiltration trench below permeable pavers. All surfaces drain to terminal retention basin	40,000 sf	1.4 acres
Lubrizol Materials	3115 Propeller Drive	26,000 sf warehouse addition approved by Planning Commission on February 12, 2008.	Yes	infiltration basin	35,700 sf	4.67 acres
Steve's Gas	1441 Spring Street	Reconstruction of gas station permit approved August, 2013	No permits have been issued to date	vegetated swale and landscape filters	15,500 sf	17,500 sf

2013-2014

Phase II Small MS4 Annual - Report

REPORTING PERIOD:07/01/2013 - 06/30/2014

WDID No: 3 40M2000012

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PASO ROBL CA 93446

Phase II Small MS4 Annual - Report - 2013-2014

Questions & Answers

Q No.	Text	DropDown Answer	CheckBoxAnswer	DescriptiveAnswer	Date Answer	Number Answer
1	Did the Permittee upload the Central Coast Post-Construction Stormwater Requirements annual reporting form and all other documents required in the form? Access form here. If the form does not open, right click on the hyperlink and chose the option, 'Save Target As'. To get full utilization of the form, the form must be viewed and completed using Adobe software. Adobe Reader can be downloaded for free.	Yes		Annual Report compliance documents are uploaded per the following: 1) PCR Annual Report March 6, 2014 - June 31, 2014 2) PCR Annual Report March 6, 2014 - June 31, 2014: Performance Req No 1 Implementation (Tech Guide) 3) PCR Annual Report March 6, 2014 - June 31, 2014: Performance Req No 1 Implementation (Template)		

Phase II Small MS4 Annual - Report - 2013-2014

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualilfied personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that threre are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Patti Gwathmey	**Title:**	**Date: 10/08/2014**

Phase II Small MS4 Annual - Report - 2013-2014

ATTACHMENTS

Attachment Title	Description	Date Uploaded	Attachment Type	Attachment Hash	Doc Part No/Total Parts
PCR Annual Report March 6, 2014 - June 31, 2014: Performance Req No1 Implementation (Tech Guide)		2014-10-08 16:45:16.0	Report Question Attachment	b1a606cb0c89dc99468c7dcd95de5a489dbe42afad6eed2cee469d5466bead	1/1
PCR Annual Report March 6, 2014 - June 31, 2014: Performance Req No1 Implementation (Template)		2014-10-08 16:45:41.0	Report Question Attachment	5464a443392486bb63485ee180da351ac64d59e0a640d824fb621cb6733993	1/1
PCR Annual Report March 6, 2014 - June 31, 2014		2014-10-08 16:43:17.0	Report Question Attachment	53e42c1cdd69ef04fda2113eae31faa5c18a75559e91454bbe83d2ee2df6a	1/1

Central Coast Post-Construction Stormwater Management Requirements (PCRs)

Resolution No. R3-2013-0032
Annual Reporting Form
August 2014 Version

Due Date: By October 15, 2014 and October 15 annually thereafter, Permittees must submit this reporting form.

Instructions: Complete form electronically. Answer questions and supply requested information for the Reporting Period only. Upload completed form to Storm Water Multiple Application and Report Tracking System (SMARTS) and name the file, "*PCRs Annual Report [insert reporting period]".* Also, upload requested attachments to SMARTS using specified nomenclature.

SECTION I: GENERAL PERMITTEE INFORMATION

WDID# and Permittee Name: 3 40M2000012 - City of Paso Robles

County: San Luis Obispo

SECTION II: REPORTING PERIOD

Reporting Period: 3/6/2014 - 6/30/2014

SECTION III: COMPLETED PROJECTS

How many projects, that received occupancy completion documentation (e.g., Certificate of Occupancy) during the Reporting Period, created and/or replaced ≥ 2,500 square feet of impervious surface? 0

SECTION III: CONTINUED ...

Project categories based on created and/or replaced impervious surface area		Number of Projects in each category that received occupancy completion documentation (e.g., Certificate of Occupancy) during the Reporting Period and had an approval per PCRs Provision B.1.c
Lower Bound	**Upper Bound**	
≥ 2,500 square feet	<5,000 square feet Net Impervious Area (all projects except single-family homes) and <15,000 square feet Net Impervious Area (only single-family homes)	0
≥5,000 square feet Net Impervious Area (all projects except single-family homes) and ≥15,000 square feet Net Impervious Area (only single-family homes)	<15,000 square feet (all projects except single-family homes) and <15,000 square feet Net Impervious Area (only single-family homes)	0
≥15,000 square feet (all projects except single-family homes) and ≥15,000 square feet Net Impervious Area (only single-family homes)	<22,500 square feet	0
≥22,500 square feet	N/A	0
Total		0

SECTION IV: PROJECTS SUBJECT TO POST-CONSTRUCTION REQUIREMENTS

Performance Requirements*	**Number of Projects subject to Performance Requirements that received completion documentation during the Reporting Period**	**Number of Projects with structural Water Quality Treatment, Runoff Retention, and/or Peak Management controls**	**Number of Projects where field verification of Site Design, Water Quality Treatment, Runoff Retention, and/or Peak Management controls was completed**	**Number of Projects where field verification confirmed ALL Site Design, Water Quality Treatment, Runoff Retention, and/or Peak Management controls were implemented in accordance with PCRs**
Only No. 1	0	N/A	0	0
Only Nos. 1 and 2	0	0	0	0
Only Nos. 1, 2, and 3	0	0	0	0
Only Nos. 1, 2, 3, and 4	0	0	0	0
Total	0	0	0	0

* Only include projects once in table. For example, if a project triggers all four performance requirements, only address that project in the, “Only Nos. 1, 2, 3, and 4” row. Do not also count the project in the cells for the above three rows.

SECTION V: SPECIAL CIRCUMSTANCES AND ALTERNATIVE COMPLIANCE

Note: If the Permittee did not grant any Special Circumstances and/or Alternative Compliance for Projects that received completion documentation during the Reporting Period, skip Section V.

To add another Project, click 'Add Row'

Add Row Delete Row

	Alternative Compliance type (Select all that apply)								
Names of Projects that received completion documentation during the Reporting Period and the Permittee granted Special Circumstances and/or Alternative Compliance	Watershed or Regional Plan	Urban Sustainability Area	Highly Altered Channel Special Circumstance	Intermediate Flow Control Facility Special Circumstance	Historic Lake or Wetland Special Circumstance	Technical Infeasibility Performance Requirement No. 2	Technical Infeasibility Performance Requirement No. 3	Technical Infeasibility Performance Requirement No. 4	**If technical infeasibility is rationale for Alternative Compliance, does Project's Stormwater Control Plan adequately demonstrate basis for infeasibility?**
No projects at this time	☐	☐	☐	☐	☐	☐	☐	☐	

SECTION V: CONTINUED ...

To add another Project, click 'Add Row'

Add Row | Delete Row

Names of Projects that received completion documentation during the Reporting Period and the Permittee granted Special Circumstances and/or Alternative Compliance	Alternative Compliance type (Select all that apply)								If technical infeasibility is rationale for Alternative Compliance, does Project's Stormwater Control Plan adequately demonstrate basis for infeasibility?
	Watershed or Regional Plan	Urban Sustainability Area	Highly Altered Channel Special Circumstance	Intermediate Flow Control Facility Special Circumstance	Historic Lake or Wetland Special Circumstance	Technical Infeasibility Performance Requirement No. 2	Technical Infeasibility Performance Requirement No. 3	Technical Infeasibility Performance Requirement No. 4	
	☐	☐	☐	☐	☐	☐	☐	☐	

SECTION VI: MITIGATION PROJECTS CONSTRUCTED FOR ALTERNATIVE COMPLIANCE

Were there any mitigation projects constructed for Alternative Compliance during the Reporting Period? ○ Yes ◉ No

If yes, did the Permittee upload to SMARTS the below information?

- A summary description of mitigation projects constructed during the Reporting Period comparing the expected aggregate results of Alternative Compliance projects to the results that would otherwise have been achieved by meeting the numeric Performance Requirements on-site. The summary should quantitatively compare results. For example, if the Alternative Compliance project is mitigating for a project that could not fully meet Performance Requirement No. 3 onsite, then the summary should quantify the following: 1) onsite retention volume required by Performance Requirement No. 3, 2) volume of runoff actually retained on site, and 3) volume of runoff retained at the Alternative Compliance project site.
- For public offsite mitigation projects, a summation of total offsite mitigation funds raised to date and a description (including location, general design concept, volume of water expected to be retained, and total estimated budget) of all pending public offsite mitigation projects

SMARTS upload title: "*PCRs Annual Report [insert reporting period] – Mitigation Projects"*

SECTION VII: LONG-TERM OPERATION AND MAINTENANCE

Did the Permittee upload to SMARTS a copy (e.g., screenshot) of the structural Stormwater Control Measure Operation and Maintenance database that shows all entries from the Reporting Period (see PCRs Provision E.3)? ○ Yes ◉ No

SMARTS upload title: "*PCRs Annual Report [insert reporting period] – Long-Term Operation and Maintenance*"

SECTION VIII: ADDITIONAL UPLOADS

Did the Permittee upload to SMARTS information to demonstrate Performance Requirement No. 1 was applied to all applicable projects during the Reporting Period (including sample checklist)? ◉ Yes ○ No

SMARTS upload title: "*PCRs Annual Report [insert reporting period] – Performance Req No1 Implementation"*

STORMWATER TECHNICAL GUIDE

COMPLIANCE WITH STORMWATER POST-CONSTRUCTION REQUIREMENTS IN SANTA BARBARA COUNTY

A Low Impact Development Approach

Project Clean Water
County of Santa Barbara
Water Resources Division

Draft 16 December 2013

Funding for this project has been provided in full or in part through an agreement with the State Water Resources Control Board. The contents of this document do not necessarily reflect the view and policies of the State Water Resources Control Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

Santa Barbara County Public Works
Water Resources Division
123 E. Anapamu St.
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Includes:

- Hope Ranch
- Isla Vista
- Los Olivos
- Mission Canyon
- Mission Hills
- Montecito
- Orcutt
- Santa Ynez
- Summerland
- Toro Canyon
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The cities of Santa Barbara and Lompoc are continuing their pre-existing requirements as approved by Water Board staff.

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CENTRAL COAST REGIONAL WATER QUALITY CONTROL BOARD

Dominic Roques
roques.dominic@waterboards.ca.gov

ASSISTANCE FROM:

Dan Cloak Environmental Consulting
www.dancloak.com

PREFACE

In 1987, Congress amended the Clean Water Act to mandate controls on discharges from municipal separate storm sewer systems (MS4s). Acting under the Federal mandate and the California Water Code, California Water Boards issue National Pollutant Discharge Elimination System (NPDES) permits that require cities, towns, and counties to regulate activities which can result in pollutants entering their storm drains.

Municipalities implement comprehensive stormwater pollution-prevention programs. Municipal staff uses Best Management Practices (BMPs) when maintaining their own streets, storm drains, and municipal buildings. They inspect businesses and construction sites, enforce when pollutant discharges are found, educate the public, and monitor the storm drain system and receiving waters.

The comprehensive municipal programs have long included controls on new development projects. As conditions of municipal approvals and permits, development projects must control pollutant sources and reduce detain, retain, and treat specified amounts of runoff.

In July 2013, the Central Coast Water Board adopted Order R3-2013-0032, with new, more stringent Post-Construction Requirements (PCRs). Projects that receive their first discretionary approval after March 6, 2014—or if no discretionary approval is required, receive their first ministerial permit after that date—are subject to the PCRs, if they create or replace 2,500 square feet or more of impervious area.

The PCRs mandate that development projects use Low Impact Development (LID) to detain, retain, and treat runoff. LID incorporates and conserves on-site natural features, together with constructed hydrologic controls to more closely mimic pre-development hydrology and watershed processes.

The process of designing, checking, and building LID features and facilities into development projects can be complicated. In particular, it can be difficult to quantify the amount of runoff proposed features and facilities can detain, infiltrate, or treat and to show the LID design meets the criteria in the PCRs.

The County of Santa Barbara obtained a grant, funded by Proposition 84 and administered through the State Water Resources Control Board, to facilitate implementation of the PCRs. Grant funds enabled preparation of this *Stormwater Technical Guide*, a sizing calculator, templates, and other associated tools, as well as outreach and training for municipal staff and land development professionals.

Applicants for development approvals in the jurisdictions on the previous page should use this *Guide* when preparing Stormwater Control Plans. However, local requirements vary. Check with staff in the jurisdiction where your project is located to identify differences that may apply. A pre-application meeting is recommended for all projects subject to the PCRs.

Links

Santa Barbara County Project Clean Water http://www.sbprojectcleanwater.org/

Central Coast Regional Water Quality Control Board www.waterboards.ca.gov/centralcoast

CONTENTS

Chapter 1. About the Stormwater Requirements

1-1 What Projects Must Comply

1-2 What is Low Impact Development?

Chapter 2. The Path to Stormwater Compliance

2-1 Step 1: Pre-Application Meeting

2-2 Step 2: Follow the Guidance

2-2 Step 3: Stormwater Control Plan

2-2 Step 4: LID Facilities Operation and Maintenance Plan

2-3 Step 5: Detailed Project Design

2-3 Step 6: Construct the Project

2-3 Step 7: Transfer Maintenance Responsibility

Chapter 3. Preparing Your Stormwater Control Plan

3-1 Objectives

3-3 Step 1: Project Information

3-3 Step 2: Opportunities and Constraints

3-4 Step 3: Conceptual Site Design

3-5 Step 4: Calculations and Documentation

3-6 Step 5: Design of LID Facilities

3-6 Step 6: Source Controls

3-6 Step 7: LID Facility Maintenance

3-7 Step 8: Construction Checklist

3-7 Step 9: Certification

Chapter 4. Documenting Your LID Design

4-1 LID and Compliance with the PCRs

4-2 Step-by-Step

Chapter 5. Preparing Your LID Facilities Operation and Maintenance Plan

5-1 Introduction

5-2 Step-by-Step

Tables and Checklists

1-1 Table 1-1: Requirements at a Glance

3-2 Stormwater Control Plan Checklist

3-6 Table 3-1: Format for Tabulating Potential Pollutant Sources and Source Controls

3-7 Stormwater Construction Checklist

4-4 Table 4-1: Runoff Factors for Small Storms

4-4 Table 4-2: Format for Tabulating Self-Treating Areas

4-4 Table 4-3: Format for Tabulating Self-Retaining Areas

4-4 Table 4-4: Format for Tabulating Areas Draining to Self-Retaining Areas

4-4 Table 4-5: Format for Tabulating Areas Draining to Bioretention Facilities and calculating minimum Bioretention Facility Size

Figures, Design Sketches, and Design Criteria

1-2 Figure 1-1: Bioretention Facility

3-3 Figure 3-1: Illustration of Replaced Impervious Area

4-1 Figure 4-1: Derivation of Sizing Factor of 0.04 for Sizing Tier 2 Bioretention Facilities

4-3 Figure 4-2: Self-retaining Areas

4-10 Bioretention Facility Cross Section with Design Criteria

4-11 Bioretention Facility Plan

4-12 Porous Pavements Design Criteria

Appendices

A. Pollutant Sources and Source Control Checklist

B. Bioretention Construction Inspection Checklist

C. Technical Criteria for Non-LID Treatment Facilities

D. Instructions for Estimating Infiltration Rate via Testing [to come]

Resources

Available at *www.sbprojectcleanwater.org*

Stormwater Control Plan Template and Directions for Tier 1 Projects

Stormwater Control Plan Template for Tier 2 and Tier 3 Projects

Stormwater Control Measure Sizing Calculator

Operation and Maintenance Forms [to come]

CHAPTER 1

THE POST-CONSTRUCTION REQUIREMENTS

The California Regional Water Quality Control Board for the Central Coast Region (Water Board) adopted the Post-Construction Requirements (PCRs) in July 2013. The PCRs apply in urbanized areas, including many unincorporated census-designated places (CDPs), throughout the Central Coast Region.

This *Stormwater Technical Guide* (*Guide*) details requirements for the jurisdictions listed on the inside cover. The *Guide* is designed to ensure compliance with the PCRs, facilitate review of applications, and promote integrated Low Impact Development (LID) design. The *Guide* interprets, clarifies, and adds to the PCR requirements.

What Projects Must Comply?

Table 1-1 summarizes the minimum requirements. Development projects in Tier 2 must incorporate the requirements in Tiers 1 and 2. Projects in Tier 3 must incorporate the requirements of Tiers 1, 2, and 3.

Table 1-1. Requirements at a Glance

Type of Project	Requirements
Tier 1 Projects, including single-family homes, that create or replace 2,500 square feet or more of impervious surface.	**Implement LID Measures:** • Limit disturbance of natural drainage features. • Limit clearing, grading, and soil compaction. • Minimize impervious surfaces. • Minimize runoff by dispersing runoff to landscape or using permeable pavements
Tier 2 Projects, other than single-family homes, that create or replace 5,000 SF or more of net impervious surface*. Detached single-family homes that create or replace 15,000 SF of or more net impervious surface*.	**Tier 1 requirements, plus:** • Treat runoff with an approved and appropriately sized LID treatment system prior to discharge from the site.
Tier 3 Projects including single-family homes that create or replace 15,000 SF or more of impervious surface.	**Tier 2 requirements, plus:** • Prevent offsite discharge from events up to the 95th percentile rainfall event using Stormwater Control Measures.

* Net impervious surface equals new and replaced impervious area minus the total pre-project-to-post-project reduction in impervious area (if any).

"Low Impact Development is a stormwater management and land development strategy applied at the parcel and subdivision scale that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely mimic pre-development hydrology.

— Puget Sound Action Team, 2005

Projects that are located within the NPDES permit boundaries defined by the Central Coast Water Resources Control Board, including cities, certain institutions, and unincorporated urban areas are subject to the PCRs. See sbprojectcleanwater.org for map of permit areas within the unincorporated portions of Santa Barbara County.

The PCRs include a Tier 4 requirement: Projects that create or replace 22,500 square feet of impervious surface, post-development peak flows discharged from the site must not exceed pre-project peak flows for the 2-year through 10-year storm events. This requirement is assumed to be met if Tier 3 requirements are implemented in accordance with this *Guide*. Additional peak-flow management, based on different criteria, may be required by the local flood control agency.

All projects must also conserve natural areas, protect slopes and channels against erosion, and comply with local stream setback and tree-preservation policies as determined by local planning departments.

What is Low Impact Development?

LID design aims to mimic pre-development site hydrology as well as protect water quality. Runoff from roofs and paved areas is dispersed to landscaped areas or routed to LID facilities distributed throughout the site. These LID facilities—typically bioretention, see Figure 1-1—infiltrate most runoff. During long and intense storms, underdrains convey treated stormwater to storm drains. During exceptionally large events, overflows are safely conveyed off-site.

Some of the advantages of LID are:

- Provides effective stormwater treatment by filtering pollutants and sequestering them within soils.
- Processes pollutants through biological action in the soil, rendering some pollutants less toxic.
- Facilities can be an attractive landscape amenity.
- Quick-draining bioretention facilities do not harbor mosquitoes or other vectors.
- Maintains the natural hydrologic condition, including recharge to groundwater and contribution to stream flows.
- Requires maintenance similar to landscaped areas of similar size; no special equipment is needed.
- Above-ground, visible facilities are easy to monitor and inspect.

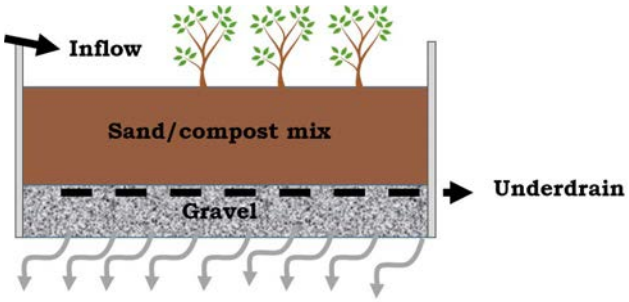


Figure 1-1. Bioretention facilities can be an attractive landscape amenity.

CHAPTER 2

THE PATH TO STORMWATER COMPLIANCE

Start Early

LID features and facilities must be integrated into the planning, design, construction, operation, and maintenance of your development project.

Your LID strategy should be an integral part of the earliest decisions about how the site will be developed. Once subdivision lot lines have been sketched, or buildings and parking have been arranged on a commercial site, the LID design may already be constrained—often unnecessarily.

At this earliest stage, also consider who will be responsible for maintaining bioretention or other LID facilities in perpetuity.

The PCRs require the local municipality to maintain a database of LID facilities and ensure the facilities are operating as designed. The site layout, drainage and LID facilities are all conditions of project approval; as such, they may not be removed or rendered ineffective without the permitting agency's approval.

In most cases, the municipality will require the property owner, by agreement, to regularly inspect the facilities, allow access for municipal inspections, and give the municipality the right to conduct remedial maintenance and recover costs if facilities are not properly maintained.

In residential subdivisions, the need to provide for maintenance of stormwater treatment facilities can affect the layout of streets and lots, decisions whether to incorporate a homeowner's association (HOA), liability, insurance, and capital considerations, and the value of the individual built lots. In addition, municipalities may require the builder provide an extended maintenance and warranty period for the facilities before turning them over to an HOA or other entity for maintenance in perpetuity. Again, it's best to start early!

"Your LID strategy should be an integral part of the earliest decisions about how the site will be developed."

Here are some of the key stormwater compliance milestones as you manage your development project:

1: Pre-Application Meeting

2: Follow this Guidance

3: Stormwater Control Plan

4: Draft Stormwater Facilities Operation and Maintenance Plan

5: Detailed Project Design

6: Construction

7: Transfer Maintenance Responsibility

1: Pre-Application Meeting

Discuss stormwater requirements for your project at a pre-application meeting with planning and development staff. Their experience with similar projects and with local procedures, requirements, and

community plans can provide invaluable insights. Current contacts are listed at the Project Clean Water website.

You should also discuss with staff the right timing for completing your Stormwater Control Plan. Often, site designs take a few iterative reviews (by staff and/or by a Design Review Committee) before a satisfactory site layout is achieved. It is important to consider site drainage and locations for bioretention facilities throughout this iterative process. However, it may make sense to delay compilation and formal submittal of your Stormwater Control Plan until the site layout is fairly well set.

2: Follow the Guide

Read this *Guide* all the way through and understand the principles and design procedures before beginning to design your project. Then, follow the steps in Chapter 3 as you lay out the site.

3: Stormwater Control Plan

Projects in Tier 1 may use the simple, abbreviated Stormwater Control Plan format and instructions in a template available on the Project Clean Water website.

For projects in Tiers 2 and 3, prepare and submit a complete Stormwater Control Plan with your application for a land use permit, or for other permits (grading or building) if planning and zoning approval is not required. The Stormwater Control Plan will demonstrate that adequate LID features and facilities can be accommodated within your site and landscape design.

Be sure the LID facilities shown on your Stormwater Control Plan Exhibit are also shown, as appropriate, on your preliminary site design, architectural design, and landscape designs.

Your Stormwater Control Plan may also be used in supporting a Negative Declaration or may be referenced in an Environmental Impact Report. In general, for most projects, implementing the techniques and criteria in this Guide will be considered to mitigate the project's potential impacts on stormwater runoff.

If your project receives planning and zoning discretionary approval, a Condition of Approval will specify the project be constructed consistent with the Stormwater Control Plan.

As described in Chapter 3, your Stormwater Control Plan will include a Construction Checklist of items to be followed up during the final design phase of your project.

Your Stormwater Control Plan must also include a statement accepting responsibility to maintain the stormwater treatment facilities until that responsibility is transferred to the project operator or owner or another responsible party, and a commitment to execute a maintenance agreement.

4: LID Facilities Operation and Maintenance Plan

The LID Facilities Operation and Maintenance Plan (O&M Plan) is a living document used to plan, direct, and record maintenance of stormwater treatment facilities. It identifies the individuals responsible for maintenance, who must keep an up-to-date copy and file periodic updates with the municipality.

The O&M plan should be updated with as-built documentation of how the facilities are constructed.

5: Detailed Project Design

During this stage, the landscape design must integrate the functionality of LID features and facilities into the aesthetic and functional values of the project.

Typical design issues include edges and transitions to allow runoff to flow from sidewalks and paved areas into bioretention areas, dissipation of energy gained by runoff flowing down slopes, planting and irrigation of bioretention facilities, and integration of berms, fences, and walls in or near bioretention facilities.

Chapter 4 includes design suggestions and tips.

Your submitted construction documents will include a Construction Checklist cross-referencing the Stormwater Control Plan features with the plan sheets. This checklist helps the plan checker to review the architectural, landscape, and grading and drainage plans and ensure the LID design features and facilities are integrated into the project design.

6: Construct the Project

Careful construction of LID facilities, coordinated with the building of the development, will help ensure the facilities function as intended and will also minimize future maintenance problems. Items to check during construction include:

- Avoid compaction of native soils in and around where bioretention facilities will be constructed.
- Divert any runoff flows during their construction.
- Closely follow design elevations.
- Grade parking lots, driveways, and streets to promote evenly distributed sheet flow into self-retaining landscaped areas or bioretention facilities.
- Set overflow inlets at the proper height so the surface of the bioretention facility ponds as intended.

Appendix B contains an inspection schedule and checklist for construction of bioretention facilities.

7: Transfer Maintenance Responsibility

Following construction—or perhaps following a maintenance and warranty period—formally transfer maintenance responsibility to the owner or operator of the project, who will maintain the facilities in perpetuity. In the case of a residential subdivision, this may be a homeowners association, if that arrangement has been approved by your municipality.

"Grade parking lots, driveways and streets to promote evenly distributed sheet flow into self-retaining landscaped areas or bioretention facilities."

CHAPTER 3

PREPARING A STORMWATER CONTROL PLAN

Objectives

Projects in Tier 1 may use the simple, abbreviated Stormwater Control Plan format and instructions in a template available on the Project Clean Water website.

Your Stormwater Control Plan for a **Tier 2** or **Tier 3** project must demonstrate your project incorporates site design characteristics, landscape features, and engineered facilities that will:

- Minimize imperviousness.
- Detain and treat, and/or retain, the specified amounts of runoff.
- Slow runoff rates.
- Reduce pollutants in post-development runoff.

You will need to show all runoff from impervious areas is either dispersed to pervious areas or is routed to a properly designed LID facility.

A complete and thorough Stormwater Control Plan will enable municipal development review staff to verify your project complies with these requirements. It is strongly recommended you retain a design professional familiar with the requirements.

Contents

Your Stormwater Control Plan will consist of a report and an exhibit. Municipal staff will use the **Stormwater Control Plan Checklist** (page 3-2) to evaluate the completeness of your Plan.

Step by Step

Plan and design your stormwater controls integrally with the site plan and landscaping for your project. This strategy requires you invest in early and ongoing coordination among project architects, landscape architects, geotechnical engineers, and civil engineers. However, it can pay big dividends in a cost-effective, aesthetically pleasing design—and by avoiding design conflicts later.

"Plan and design your stormwater controls integrally with the site and landscaping for your project."

Your initial, conceptual design for the project should include site drainage. This should include identifying areas where runoff can be dispersed and/or the location and approximate size of stormwater treatment and flow-control facilities.

Follow these eight steps to complete your preliminary design and your Stormwater Control Plan.

Step 1: Project Information

Step 2: Opportunities and Constraints

Step 3: Conceptual Site Design

Step 4: Calculations and Documentation

Step 5: Design Details

Step 6: Source Controls

Step 7: Maintenance

Step 8: Construction Checklist

A template containing an example outline can be downloaded from the Project Clean Water website.

Stormwater Control Plan Checklist

Contents of Exhibit

- ❒ Existing natural hydrologic features (depressions, watercourses, relatively undisturbed areas) and significant natural resources.
- ❒ Proposed design features and surface treatments used to minimize imperviousness and reduce runoff.
- ❒ Existing and proposed site drainage network and connections to drainage off-site.
- ❒ Entire site divided into separate Drainage Management Areas (DMAs). Each DMA has a unique identifier and is characterized as self-retaining (zero-discharge), self-treating, or draining to a LID facility.
- ❒ Proposed locations and footprints of LID facilities.
- ❒ Potential pollutant source areas, including loading docks, food service areas, refuse areas, outdoor processes and storage, vehicle cleaning, repair or maintenance, fuel dispensing, equipment washing, etc. listed in Appendix A.

Contents of Report

- ❒ Project information including project name; application number; location; parcel numbers; applicant contact information; land use information; site area; existing, new, and replaced impervious area, and applicable PCR requirements and exceptions.
- ❒ Narrative analysis or description of site features and conditions, and opportunities and constraints for stormwater control.
- ❒ Narrative description of site design characteristics that protect natural resources including endangered species habitat, protected vegetation, and archaeological resources, and preserve natural drainage features, minimize imperviousness, and disperse runoff from impervious areas.
- ❒ Tabulation of proposed pervious and impervious DMAs, showing self-treating areas, self-retaining areas, areas draining to self-retaining areas, and areas tributary to each LID facility.
- ❒ Proposed sizes, including supporting calculations, for each LID facility.
- ❒ Narrative description of each DMA and explanation of how runoff is routed from each impervious DMA to a self-retaining DMA or LID facility.
- ❒ Description of site activities and potential sources of pollutants.
- ❒ Table of pollutant sources identified from the list in Appendix A and for each source, the source control measure(s) used to reduce pollutants to the maximum extent practicable.
- ❒ Description of signage for bioretention facilities.
- ❒ General maintenance requirements for bioretention facilities and site features.
- ❒ Means by which facility maintenance will be financed and implemented in perpetuity.
- ❒ Statement accepting responsibility for interim operation & maintenance of facilities.
- ❒ Stormwater Construction Checklist.
- ❒ Certification by a professional civil engineer, architect, or landscape architect.

1: Project Information

Enter the following into the Project Data Form in the Stormwater Control Plan Template:

- Project Name/Number
- Application Submittal Date
- Project Location
- Applicant Contact Information
- Project Phase
- Project Type and Description
- Project Site Area (square feet)
- Total Pre-Project Impervious Surface Area
- Total Post-Project Impervious Surface Area
- Total New Impervious Surface Area
- Total Replaced Impervious Surface Area within an Urban Sustainability Area (USA)
- Total Replaced Impervious Area not within a USA
- Watershed Management Zone
- Design Storm Frequency and Depth

To determine replaced impervious surface area, it is necessary to overlay a drawing of the existing, pre-project impervious areas with the proposed site plan and evaluate which portions of the existing impervious areas will be covered with new impervious surfaces. See the example in Figure 3-1.

Urban Sustainability Areas are areas, approved by Water Board staff, where municipalities seek to preserve or enhance an existing pedestrian and/or public-transit-oriented urban design through high-density infill and redevelopment. For a list of Urban Sustainability Areas (USAs) and associated maps, visit the Project Clean Water website.

2: Opportunities and Constraints

Review the following information before developing your stormwater control design:

- Existing natural hydrologic features, including natural areas, wetlands, watercourses, seeps, springs, and areas with significant trees.
- Site constraints such as endangered species habitat, protected vegetation, and archaeological resources.
- Site topography and drainage, including the contours of slopes, the general direction of surface drainage, local high or low points or depressions, and any outcrops or other significant geologic features.
- Zoning, including setbacks and minimum landscaping requirements and open space.
- Soil types—including NRCS Hydrologic Soil Groups—and depth to groundwater.

Prepare a brief narrative describing site opportunities and constraints.

Opportunities might include low areas, oddly configured or otherwise unbuildable areas,

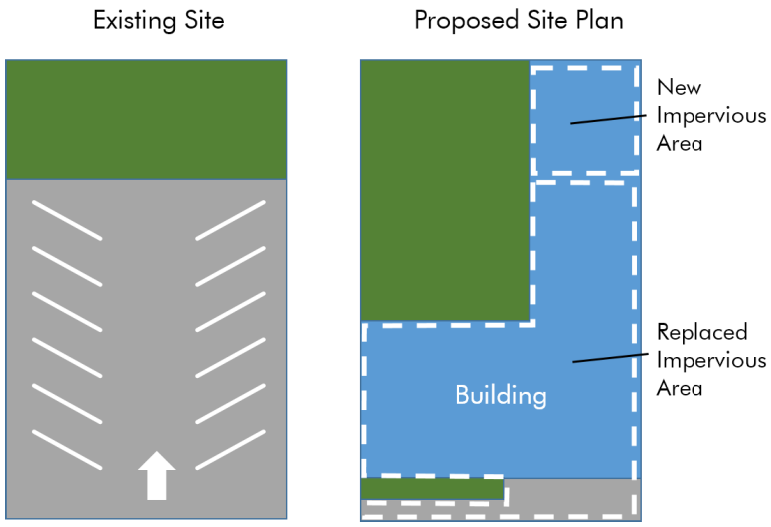


Figure 3-1. Illustration of Replaced Impervious Area

setbacks, easements, or buffers (which can double as locations for bioretention facilities), differences in elevation (which can provide hydraulic head needed to move runoff to LID facilities), and soils favorable to infiltration.

Constraints might include impermeable soils, near-surface bedrock, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability (for example, coastal bluffs), high-intensity land use, heavy pedestrian or vehicle traffic, endangered species habitat, protected vegetation, archaeological resources, or safety concerns.

"Setbacks, easements, and buffers can double as locations for bioretention facilities."

3: Conceptual Site Design

Optimize the site layout. Apply the following design principles:

- Define the development envelope and protected areas, identifying areas that are most suitable for development and areas that should be left undisturbed.
- Limit grading; preserve natural landforms and drainage patterns.
- Set back development from creeks, wetlands, and riparian habitats to the maximum degree practical and at minimum, as required by local policies.
- Preserve significant trees.

Limit paving and roofs. Where possible and consistent with zoning, design compact, taller structures, narrower and shorter streets and sidewalks, smaller parking lots (fewer stalls, smaller stalls, and more efficient lanes), and indoor or underground parking. Examine the site layout and circulation patterns and identify areas where landscaping or planter boxes can be substituted for pavement.

Use pervious pavements where possible. Inventory paved areas and identify locations where permeable pavements, such as crushed aggregate, turf block, unit pavers with permeable joints, pervious concrete, or pervious asphalt can be substituted for impervious concrete or asphalt paving. Pervious pavements are most applicable where native soils are permeable. On sites with clay soils, it may still be possible to use to use unit pavers or pervious pavement with a sufficiently deep and well-drained base course. Pervious pavements such as turf block can sometimes be used for overflow parking or for emergency access lanes (check with the local fire department).

Direct drainage to landscaped areas. There are two options for handling runoff from impervious areas:

- Disperse runoff to lawns or landscaping. Limit the ratio of impervious to pervious area to 2:1 maximum. Pervious areas must be relatively flat, and the surface should be graded to a slightly concave surface to create a "self-retaining" area. Sites in densely urbanized areas are often too constrained to implement this option.
- Route runoff to LID facilities. LID facilities detain and infiltrate runoff. For rough site layout, consider that bioretention facilities require between 4% and 10% of tributary impervious area.

See Chapter 4 for design criteria for self-retaining areas and bioretention facilities.

Tips for Conceptual Drainage Design.

Most LID facilities are bioretention facilities and include underdrains. A bioretention facility requires three to four feet of **head** from inlet to underdrain outlet, which can be

connected to an underground storm drain or daylighted.

On flat sites, it usually works best to intersperse self-retaining areas and bioretention facilities throughout the site. Grade parking lots, and driveways to sheet flow runoff directly into the landscaped areas. Use valley gutters or trench drains, rather than underground pipes, to convey runoff longer distances.

On sloped sites, it may work better to collect upslope runoff in conventional catch basins and pipe it to downslope bioretention facilities.

Use the head from roof downspouts by connecting leaders all the way to landscaping or bioretention facilities. Where necessary, bubble-ups can be used to disperse piped runoff.

Siting LID facilities. Facilities should be easily accessible for inspection and maintenance.

In commercial, mixed-use, and multi-family developments, facilities can be located in parking medians, parking islands, street setbacks, side and rear setbacks, and other landscaped areas.

In residential subdivisions, the most practical strategy may be to drain the lots to the street in the conventional manner, and then drain the street to a bioretention area. It is most advantageous to create a separate parcel or parcels owned in common, which can double as a landscape amenity or a park. (This is one reason why it is important to plan stormwater treatment and flow-control before drawing subdivision lot lines.) Facilities in back or side yards should be avoided. If facilities are located on individual lots, prospective buyers may find undesirable the necessary legal restrictions on what they can do with those facilities.

Other types of treatment facilities. Bioretention facilities can typically be fit into parking medians, street setbacks, foundation plantings, and other landscaping features without significantly affecting the uses or layout of the site.

Further, bioretention facilities are relatively easy to maintain, provide aesthetic appeal, attenuate peak flows, and are quite effective at removing pollutants, including pollutants associated with very fine particulates in rain and atmospheric dust.

Alternative designs should provide equal or greater protection against shock loadings and spills, and equal or greater accessibility and ease of inspection and maintenance.

In some cases, it is very difficult to accommodate bioretention facilities on smaller, densely developed sites. Tree-box-type biofilters or in-vault media filters may be used to meet **Tier 2** (treatment) requirements in the following circumstances:

- Projects that create or replace an acre or less of impervious area and are located in a locally designated pedestrian-oriented district, and have at least 85% of the entire project site covered by permanent structures
- Facilities receiving runoff solely from existing (pre-project) impervious areas.
- Historic sites, structures, or landscapes that cannot alter their original configuration without compromising their historic integrity.

The proposed tree-box-type biofilters or in-vault media filters must meet the criteria in Appendix C.

4. Calculations and Documentation

Your Stormwater Control Plan must include an Exhibit showing the entire site divided into Drainage Management Areas (DMAs) and the locations and approximate sizes of LID facilities. Each should be clearly labeled so the Exhibit can be cross-referenced to the text and tables in the report.

The report will include a brief description of each DMA and each LID facility—and tabulated calculations.

Chapter 4 includes a detailed procedure for documenting your site design and showing your LID facilities meet the minimum sizing requirements.

5. Design of LID Facilities

Design criteria in Chapter 4 will assist you to plan for construction of LID facilities as part of your project. The criteria that apply to your planned facilities should be summarized in your Stormwater Control Plan. Anticipated exceptions to the design criteria should be noted.

6. Source Controls

Your Stormwater Control Plan must identify and describe any potential pollutant sources that will be created or expanded as part of the development project.

Review the **Pollutant Sources/Source Control Checklist** (Appendix A). Begin by identifying which of the listed potential sources are associated with your project.

Then, create a table in the format shown in Table 3-1. Enter each identified source in the left-hand column. Then add the corresponding permanent, structural source controls from the Pollutant Sources/Source Control Checklist into the center column of your table.

In a narrative, explain any special features, materials, or methods of construction that will be used to implement these permanent, structural source controls.

To complete your table, refer once again to the Pollutant Sources/Source Control Checklist (Appendix A, Column 4). List the operational source controls corresponding to the sources you've identified into the right-hand column of your table. These controls should be implemented as long as the identified activities (sources) continue at the site. These controls may be required as a condition of a use permit or other revocable discretionary approval for specific uses of the site.

7. LID Facility Maintenance

For Tier 2 and 3 Projects, your Stormwater Control Plan will describe maintenance needs of your bioretention facilities, source control measures, and stormwater conveyance systems. The maintenance plan will identify the location of the facilities to be inspected, the frequency of periodic

Table 3-1. Format for Source Control Table

Potential Source of Runoff Pollutants	Permanent/Structural Source Control BMPs	Operational/Pollution Prevention BMPs

inspections, and maintenance responsibilities. Annual reporting will be provided to the municipality at the facility owner's expense.

For residential subdivisions, consult with municipal staff, then detail the planned arrangements in your Stormwater Control Plan. Include, as available and applicable, information about joint ownership of parcels where bioretention facilities are to be located, about incorporating a homeowners association, about provisions to be incorporated in Codes, Covenants, and Restrictions, and other relevant information.

Include in your Stormwater Control Plan the following statement:

"The applicant accepts responsibility for the operation and maintenance of stormwater treatment and flow-control facilities for the life of the project. Any future change or alteration, or the failure to maintain any feature described herein can result in penalties including but not limited to fines, property liens, and other actions for enforcement of a civil judgment. A complete and detailed list of maintenance and inspection requirements, including inspection frequencies, will be required in your Stormwater Facilities Operation and Maintenance Plan (O&M Plan). Your O&M plan must also include detailed documentation of how your facilities are constructed. The O&M plan will be linked to a legally binding agreement executed between the owner and the municipality. That agreement identifies the legally responsible person charged with implementing the O&M Plan over the life of the project. This agreement is a covenant running with the land, so that transfer to a new owner will transfer the responsibility for O&M.

For this stage, include in your Stormwater Control Plan a summary of the general maintenance requirements for your bioretention facilities. You will find a discussion of maintenance requirements in Chapter 5.

8. Construction Checklist

Include in your Stormwater Control Plan a Construction Checklist following the format in Table 3-2.

Complete the first two columns in the checklist, listing each stormwater source control and treatment measure identified in the plan and identifying the page number where it appears.

Later, you will cut-and-paste the same table into your construction documents. Complete the rightmost column, listing the sheet number(s) where the same measure is shown on the construction plans.

Table 3- 2. Format for Stormwater Construction Checklist

Page Number in Stormwater Control Plan	Source Control or Treatment Control Measure	Plan Sheet #

8. Certification

Include the following statement by a licensed civil engineer, architect, or landscape architect:

"The preliminary design of stormwater treatment facilities and other stormwater pollution control measures in this plan are in accordance with the current edition of the Santa Barbara County Project Clean Water's Stormwater Technical Guide."

Alternative Compliance Options

The PCRs allow two options for alternative compliance with on-site retention requirements (Tier 3). Both require a demonstration that on-site compliance, as described above, is technically infeasible. Tier 2 (treatment) requirements must still be met on-site.

To propose alternative compliance, first prepare a complete Stormwater Control Plan as described in this chapter. Prepare your LID design as described in Chapter 4. The Stormwater Control Plan should show a complete and thorough implementation of opportunities for implementing LID, including delineation of DMAs and sizing of LID facilities. Show clearly in the plan the extent to which LID can and will be implemented on-site and explain why further implementation of LID is infeasible.

Potential causes of infeasibility include:

- High seasonal groundwater limits infiltration and/or prevents construction of subgrade stormwater control measures
- Near-surface bedrock or other impermeable conditions limit infiltration
- Soil types significantly limit infiltration
- Pollutant mobilization in soil or groundwater is a documented concern
- Space constraints imposed by infill projects, some redevelopment, and high density development, etc.
- Geotechnical hazards
- Proximity to drinking water wells (within 100')
- Incompatibility with connections to the municipal storm drain system (for example, a project drains to an existing stormwater collection system, the elevation of which precludes connections to a properly functioning treatment or flow control facility).

Ten Percent Adjustment. Compliance with the criterion to prevent offsite discharge from events up to the 95th percentile rainfall event can be waived if stormwater control measures occupy an area equivalent to no less than 10% of the project's "Equivalent Impervious Surface Area."

Tabulate "Equivalent Impervious Surface Area" and the area of stormwater control measures and show totals for each; then divide the area of stormwater control measures by the Equivalent Impervious Surface Area to show the 10% criterion is met or exceeded.

Formats and instructions for this tabulation are in Chapter 4.

Off-site compliance. Nearly all development projects should be able to achieve on-site compliance using the instructions and criteria in the *Guide*.

If you believe on-site compliance is infeasible for your site, and you wish to propose an off-site mitigation project, begin by contacting municipal staff for further guidance.

CHAPTER 4

DOCUMENTING YOUR LID DESIGN

LID and Compliance with the PCRs

The following design and documentation procedure facilitates rapid and thorough evaluation of a LID design for compliance with the Post-Construction Requirements.

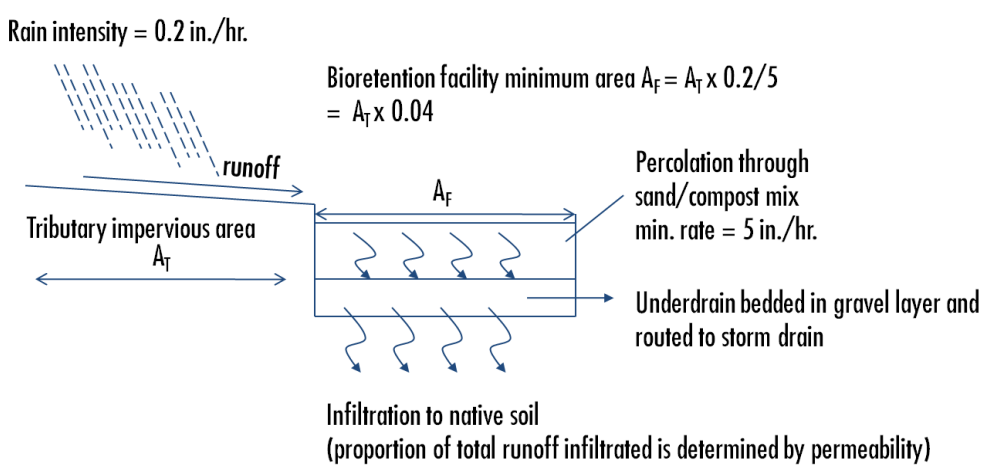
The procedure involves dividing the site into Drainage Management Areas (DMAs) and tracking the drainage from each DMA. The procedure accounts for pervious areas and dispersal of runoff from impervious area to landscape. The procedure is iterated until LID facilities are adequately sized to treat runoff (for projects in Tier 2) or retain runoff (Tier 3).

For **Tier 2** projects, LID facilities are designed to detain and treat runoff produced by a rainfall intensity of 0.2 inches per hour. A sizing factor of 0.04 is used, which greatly simplifies calculations. See Figure 4-1.

For **Tier 3** projects, LID facilities are sized according to the design storm depth, which varies with location. LID facilities may be sized with a volume equal to the runoff volume produced by the design storm (simple method) or by iterative calculations routing the design storm hydrograph through the facility. These calculations account for infiltration that occurs simultaneously with inflow (routing method). The routing

Figure 4-1. Derivation of Sizing Factor of 0.04 for Sizing Tier 2 Bioretention Facilities

As specified in the PCRs, bioretention facilities for Tier 2 are designed to retain and treat runoff produced by a rainfall intensity equal to 0.2 inches per hour. Measured over years, these low-intensity storms produce most of the total volume of runoff (80% or more). The planting medium (sand/compost mix) specified in this Guide is designed to filter runoff at a rate of at least 5 inches per hour. If 100% of rainfall ends up as inflow to the bioretention facility (a conservative assumption), then the ratio of tributary impervious area to bioretention surface area needs to be: 0.2 inches/hour ÷ 5 inches/hour = 0.04.



method results in a smaller facility volume and footprint.

An MS-Excel-based calculator accompanying this *Guide* facilitates tracking of DMAs and sizing calculations for Tier 2 and Tier 3 projects. It should be used to prepare your design and your Stormwater Control Plan submittal.

Step-by-Step

The procedure requires the following steps:

1. Delineate DMAs.
2. Identify DMA types. Minimize the amount of impervious area draining to bioretention facilities.
3. Identify bioretention facility locations.
4. Calculate the required minimum area (footprint) of each bioretention facility.
5. Compare the required footprint to the area available. Iterate until all bioretention facilities meet or exceed the minimum required area.

1: Delineate DMAs

Drainage Management Areas (DMAs) are portions of a project site that drain to a common point. Each DMA must contain only one type of surface (e.g., landscaped, impervious, or pervious pavement).

In your Stormwater Control Plan Exhibit, lines delineating DMAs will generally follow roof ridges and grade breaks. It is advantageous to first prepare a base map using the project grading plan and roof plan, and then delineate the DMAs. This helps ensure your Stormwater Control Plan is consistent with the site plan, landscaping plan, and architectural plans.

There are four types of DMAs:

- Self-treating areas
- Self-retaining areas
- Areas draining to self-retaining areas
- Areas draining to a bioretention facility

Self treating areas are natural or landscaped areas that do not drain to bioretention facilities, but rather drain directly off site or to the storm drain system. Examples include upslope undeveloped areas which are ditched and drained around a development and grassed slopes which drain directly to a street or storm drain. In general, self-treating areas include no impervious areas, unless the impervious area is very small (5% or less) relative to the receiving pervious area, and slopes are gentle enough to ensure runoff will be absorbed into the vegetation and soil.

Self-retaining areas are used where, because of site layout or topography, it is not possible to drain entirely pervious areas off-site separately. The technique works best on flat, heavily landscaped sites. To create self-retaining turf and landscape areas in flat areas or on terraced slopes, berm the area or depress the grade into a concave cross-section so that these areas will retain the first inch of rainfall. Specify slopes, if any, toward the center of the pervious areas. Inlets of area drains, if any, should be set 3 inches or more above the low point to allow ponding. **Green roofs** and **pervious pavements**—when constructed according to the design criteria in this Guide—are considered self-retaining areas.

Areas draining to self-retaining areas. Runoff from impervious areas, such as roofs, can be managed by routing it to self-retaining pervious areas. The maximum ratio is 2 parts impervious area for every 1 part pervious area. The drainage from the impervious area

Runoff from impervious areas, such as roofs, can be managed by routing it to self-retaining pervious areas. The maximum ratio is 2 parts impervious area for every 1 part pervious area.

must be directed to and dispersed within the pervious area, and the entire area must be designed to retain an inch of rainfall without flowing off-site. For example, if the maximum ratio of 2 parts impervious area into 1 part pervious area is used, then the pervious area must be graded concave or bermed so that 3 inches of water over its surface are absorbed before overflowing to an off-site drain. Prolonged ponding is a potential problem at

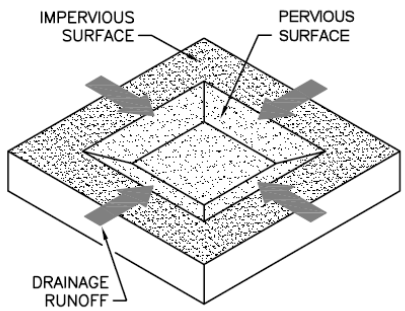


Figure 4-2. Self-retaining areas are designed to retain the first one inch of rainfall without producing any runoff. During intense storms, runoff may drain off-site, to the storm drain system, or to LID facilities.

higher impervious/pervious ratios. In your design, ensure that the pervious area soils infiltrate well enough to handle the additional run-on.

Areas draining to a LID facility. The square footage of these areas is used to calculate the required footprint and volume of the LID facility. More than one drainage area (DMA) can drain to the same LID facility. However, a particular DMA can only drain to one LID facility.

Where possible, design site drainage so only impervious roofs and pavement (not landscaped areas) drain to LID facilities. This yields a simpler, more efficient design and also helps protect LID facilities from becoming clogged by sediment.

2. Categorize and Tabulate DMAs

For each DMA, determine whether it will be self-treating, self-retaining, drains to a self-retaining area, or drains to a LID facility. Group the DMAs by type. For each DMA, tabulate the square footage and the post-project surface, and corresponding runoff factor. Use the surface types and runoff factors in Table 4-1.

3. Select and Lay Out LID Facilities

From your conceptual drainage design (see Chapter 3) identify the locations and footprint of LID facilities.

Design criteria for LID facilities are at the end of this chapter.

Once you have laid out the LID facilities, calculate the square footage you have set aside for each LID facility.

Then, **recalculate the square footage of your DMAs** to omit the square footage now dedicated to LID facilities.

4. Calculate minimum facility footprints

For **Tier 2** projects, the minimum area for bioretention facilities can be found by summing up the contributions of each tributary DMA and multiplying by the sizing factor of 0.04. Table 4-5 shows a format for tabulating DMAs draining to a LID facility and for calculating the required minimum area of a bioretention facility that meets the Tier 2 criteria. Table 4-5 must be completed for each bioretention facility—or use the sizing calculator that accompanies this *Guide*.

Table 4-1. Runoff Factors for small storms (for LID design)

Roofs and paving	1.0
Landscaped areas	0.1
Bricks or solid pavers on sand base	0.5
Pervious concrete or asphalt	0.0
Turfblock or gravel—total section at least 6" deep	0.0

Table 4-2. Format for Tabulating Self-Treating Areas

DMA Name	Area (square feet)

Table 4-3. Format for Tabulating Self-Retaining Areas

DMA Name	Area (square feet)

Table 4-4. Format for Tabulating Areas Draining to Self-Retaining Areas

DMA Name	Area (square feet)	Post-project surface type	Runoff factor	(Area × Runoff Factor)	Receiving self-retaining DMA	Receiving self-retaining DMA Area (square feet)	Ratio

Table 4-5. Format for Tabulating Areas Draining to Bioretention Facilities and Calculating Minimum Bioretention Facility Size (Tier 2 Projects)

DMA Name	DMA Area (square feet)	Post-project surface type	DMA Runoff factor	DMA Area × runoff factor	Facility Name		
					Facility Sizing factor	Minimum Facility Size	Proposed Facility Size
Total>					0.04		

For **Tier 3** projects, first find the applicable storm depth based on location. Use the maps and instructions on the Central Coast Water Board website (search for "Central Coast 95th percentile rainfall maps"). The 95th percentile storm applies throughout the areas of Santa Barbara County to which the PCRs apply. Storm depths vary from 1.4 to 2.4 inches.

Next, determine any adjustments allowed for previously existing development, as follows:

- From your project data form, identify **replaced** impervious areas within an Urban Sustainability Area (USA) and not within a USA.
- **Replaced impervious square footage within a USA** may be omitted from your LID facility sizing calculations (that is, multiply by zero).
- **Replaced impervious square footage not within a USA** may be multiplied by 0.5 before entering it into your LID facility sizing calculations.

Note that square footage omitted or halved may be applied, at your discretion, to any DMA, thereby reducing the required size of the LID facility to which that DMA is tributary.

The calculator accompanying this *Guide* allows you to enter, for each DMA, new impervious area, replaced impervious area in a USA, and replaced impervious area not in a USA.

Given the storm depth (convert to feet) and applicable amount of impervious area (in square feet or SF), calculate the required facility size using the simple method or the routing method described below:

Simple method: Determine the required minimum volume V (in cubic feet) by multiplying as follows:

$$V = \Sigma\,[\text{DMA SF} \times \text{runoff factor}] \times \text{storm depth}$$

Routing method: Enter the following information into the calculator accompanying this *Guide:*

- New tributary impervious area
- Replaced tributary impervious area within a USA
- Replaced tributary impervious area not within a USA
- Design storm depth
- Hydrologic Soil Group or design infiltration rate for subsurface soils (see discussion below)
- Facility infiltration area (area in contact with subsurface soils—minimum is 4% of tributary impervious area)

The calculator performs the following based on the Santa Barbara Unit Hydrograph method:

- Distributes the design storm depth over time increments according to a Type 1 unit hydrograph
- Calculates facility inflow rate and volume for each time increment
- Calculates facility infiltration rate and infiltration volume for each time increment
- Calculates incremental increase or decrease in storage and cumulative storage for each time increment
- Tracks and outputs time for facility to drain fully

The calculator outputs the maximum cumulative storage volume required to retain the design storm. As required by the PCRs, the calculator multiplies this volume by 1.2 when the drawdown time exceeds 48 hours (the likely condition when facilities are located in lower-permeability soils).

This is the minimum storage volume to be used for your design.

Infiltration rate for routing method: You may use the default option or, alternatively, submit data from on-site testing.

The default option is to use the Hydrologic Soil Group (HSG) that best characterizes site soils. To support your selection of an HSG, attach to your Stormwater Control Plan on-site boring logs or other information such as a geotechnical report for the site. In the calculator, HSG A/B soils (soils with no significant clay component) are assigned an infiltration rate of 0.75 in/hr. and HSG C/D soils are assigned an infiltration rate of 0.25 in/hr.

Should you wish to submit data from on-site testing; general instructions are included in Appendix D. Acceptance of results is at the discretion of municipal staff. Because of limitations in the precision of infiltration rate testing at low rates, this option may be used only to support an infiltration of 0.5 in/hr. or greater; otherwise the default 0.25 in/hr. will apply.

For LID facilities other than bioretention—such as **dry wells, infiltration trenches, or infiltration basins**—divide the infiltration rate by a safety factor of 2 to account for potential reductions in infiltration rates over time. (This factor may be waived by local staff if an adequately designed and maintained treatment system is installed upstream of the infiltration facility.)

To design a bioretention facility that contains the minimum volume, assume the porosity Φ of the gravel layer is equal to 0.4. The underdrain is placed at the top of this layer. Storage in the planting soil and surface reservoir is not credited.

If the simple method is used for sizing, then divide the calculated minimum storage volume by 0.4 to determine the volume of gravel required. Dividing the volume of gravel by the facility infiltration area (horizontal plane in contact with native soils, in square feet) yields the required average gravel layer depth.

If the routing method is used, then the minimum storage volume required changes as the facility infiltration area (typically this is the same as the footprint) is adjusted. Try entering different facility infiltration areas into the calculator, finding the resulting minimum storage volume, and determining the resulting gravel layer depth.

5. Repeat until facility area is adequate

The calculator is set up to track DMAs and the routing of drainage from DMAs to LID facilities. The calculator facilitates exploration of options to delineate DMAs differently and associate DMAs with different LID facilities and calculates the minimum storage volume that results. Iterate (repeat) this process to develop your design.

Review the site plan to determine if, for each LID facility, the square footage reserved is sufficient to accommodate the minimum footprint. Also consider (for Tier 3 projects) if the resulting gravel depth is constructible.

If necessary, revise your site plan, facility designs, or both. Revisions may include:

- Reducing the overall imperviousness of the project site.

- Changing the grading and drainage to redirect some runoff toward other LID facilities which may have more capacity.
- Making tributary landscaped DMAs self-treating or self-retaining.
- Expanding the LID facility footprint/infiltration area.
- Using large-diameter pipes, arches, vaults, or other structures to more efficiently create subsurface storage and thereby reduce the facility depth and volume of gravel required.

Bioretention facility design criteria

Layout. Bioretention facilities may be of any shape. However, the following layers must be designed and built flat and level throughout the facility:

- bottom of the excavation
- top of gravel storage layer
- top of soil layer
- rim of facility reservoir

See page 4-10. The facility must be designed to "fill up like a bathtub." This rule ensures all the storage is used during intense rainfall, prevents short-circuiting, and avoids erosion of the soil mix.

The surface reservoir should be level and circumscribed by a rigid boundary such as a concrete curb, masonry, or landscape timbers. To address concerns about a trip hazard, or to achieve a softer visual affect, soil mix and/or mulch may be gently mounded against the rigid edge. Plantings can be selected and arranged to discourage entry.

Gravel layer. "Class 2 permeable," Caltrans specification 68-2.02(F)(3), is recommended. Drain rock or other granular material may be used; however, a layer of pea gravel or other intermediate-sized material should cover the top of the drain rock to reduce movement of fines from the soil layer into the interstices of the drain rock. Do not use filter fabric for this purpose.

Soil mix. A mixture of sand (60%-70%) and compost (30%-40%) should be used. The specification developed by the Bay Area Stormwater Management Agencies Association (BASMAA, 2010) is recommended.

Underdrain. Use minimum 4" dia. PVC SDR 35 or equivalent, perforated pipe, installed with the holes facing down. The underdrain itself must be in the bedded in the gravel layer; the discharge elevation (typically, where the underdrain is connected to the overflow structure) is critical and must be no lower than the top of the gravel layer. Provide a threaded, capped cleanout connected by a sweep bend.

Landscape Design and Landscaping. Many bioretention facilities incorporate native plants in an attractive garden setting, achieving low maintenance costs, low water demand, and maximum habitat value. However, combined uses, including active uses on turf or mulch, may be appropriate for part or all of a bioretention facility.

Select a plant palette to tolerate fast-draining soils and the microclimate specific to the facility location. The soil surface will be inundated briefly and rarely (for a few hours on possibly up to 5 occasions during a wet winter, but typically less frequently) but otherwise dry unless irrigated. Consider the facility's relationship to existing and proposed buildings and the resulting exposure to sun, heat, shade, and wind.

Here are some problem conditions that should be avoided when developing a planting plan:

- Overly dense plantings that, after growing in, prevent flow into and through the surface reservoir
- Aggressive roots that block inflow or percolation
- Invasive weeds
- Plants that need irrigation or fertilization

Trees and large shrubs installed in bioretention facilities are susceptible to blowing over before roots are established. They should be staked securely. Three stakes per tree are recommended at windy sites.

Aged mulch, also called compost mulch, reduces the ability of weeds to establish, keeps the soil mix moist, and replenishes soil nutrients. Compared to bark mulch, aged mulch has somewhat less tendency to float into overflow inlets during intense storms.

Irrigation. Irrigation controls should allow separate control of times and durations of irrigation for bioretention facilities vs. other landscape areas. Smart irrigation controllers are strongly encouraged. Available controllers can access weather stations, use sensors to measure soil temperature and moisture, and allow input of soil types, plant types, root depth, light conditions, slope, and usable rainfall. Bioretention facilities may need to be irrigated more than once a day.

Drip emitters are strongly recommended over spray irrigation. Use multiple, lower-flow (0.5 to 2 gallons per hour) emitters—two to four emitters for perennials, ground covers, and bunchgrasses; four to six emitters for larger shrubs and trees.

- If spray heads are used, they must be positioned to avoid direct spray into outlet structures.

Signage. Each bioretention facility must include a sign meeting current Project Clean Water standards. Signs may be available from Project Clean Water; check for availability. Signs must be visible to site users and to maintenance personnel.

Tips for avoiding design conflicts.

Review your bioretention design for the following:

- Elevations all around each facility are consistent with grading, drainage, and paving plans, and with architectural plans.
- Facilities do not interfere with circulation or with pedestrian access between parking areas and building entrances.
- Facilities are represented in architectural and landscape renderings.
- Bioretention facilities are shown in landscape plans, and a suitable plant palette has been chosen.
- Cable vaults, phone vaults, electrical boxes, and other utility boxes are accommodated in designated locations outside the bioretention facilities.
- Foundations and pavement subgrades adjacent to the facilities are shored and protected against moisture intrusion, as needed.

Ten Percent Adjustment

As noted in Chapter 3, following determination that it is infeasible to incorporate facilities that will detain the specified amount of runoff on-site, compliance may be achieved by dedicating a minimum 10% of the site's "Equivalent

Impervious Surface Area" (EISA) to Stormwater Control Measures (SCMs).

Calculation of EISA. Divide the site into DMAs. Delineate separate DMAs for each surface type.

Tabulate and total the square footage of DMAs with concrete or asphalt paving, conventional or metal roofs, or other wholly impervious surfaces.

Then tabulate the square footage of DMAs with the surfaces shown in Table 4-6. Multiply the square footage of each DMA by the "correction factor" shown and total the products.

Total the contributions of the pervious and partially pervious DMAs. This is the EISA for the site.

Calculation of SCM Area. Total the square footage of bioretention facilities and other facilities designed using the simple method or the calculator.

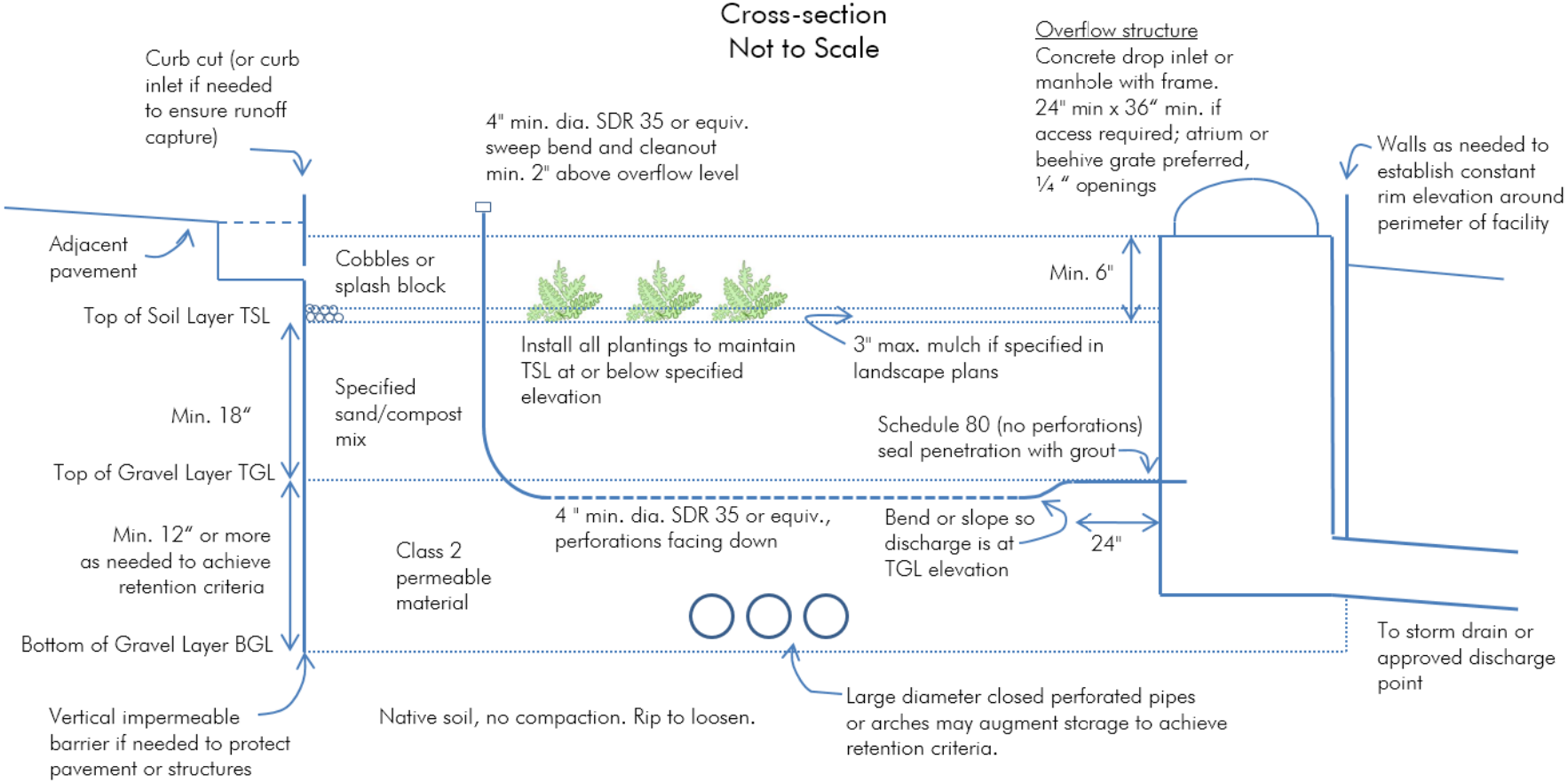
Ratio. Divide the SCM Area by the EISA to determine if the 10% criterion is met. Use of the 10% adjustment requires that the applicant first demonstrate the infeasibility of implementing bioretention facilities sized using the calculator to manage runoff from all impervious DMAs. The project must retain on-site the amount of runoff feasible.

Table 4- 6.
Correction Factors for Use in Calculating Equivalent Impervious Surface Area (EISA) (from the PCRs)

Pervious Surface	Correction Factor
Pervious concrete	0.60
Cobbles	0.60
Pervious Asphalt	0.55
Natural Stone (without grout)	0.25
Turf Block	0.15
Brick (without grout)	0.13
Unit Pavers on Sand	0.10
Crushed Aggregate	0.10
Grass	0.10

Bioretention Facility

Cross-section
Not to Scale

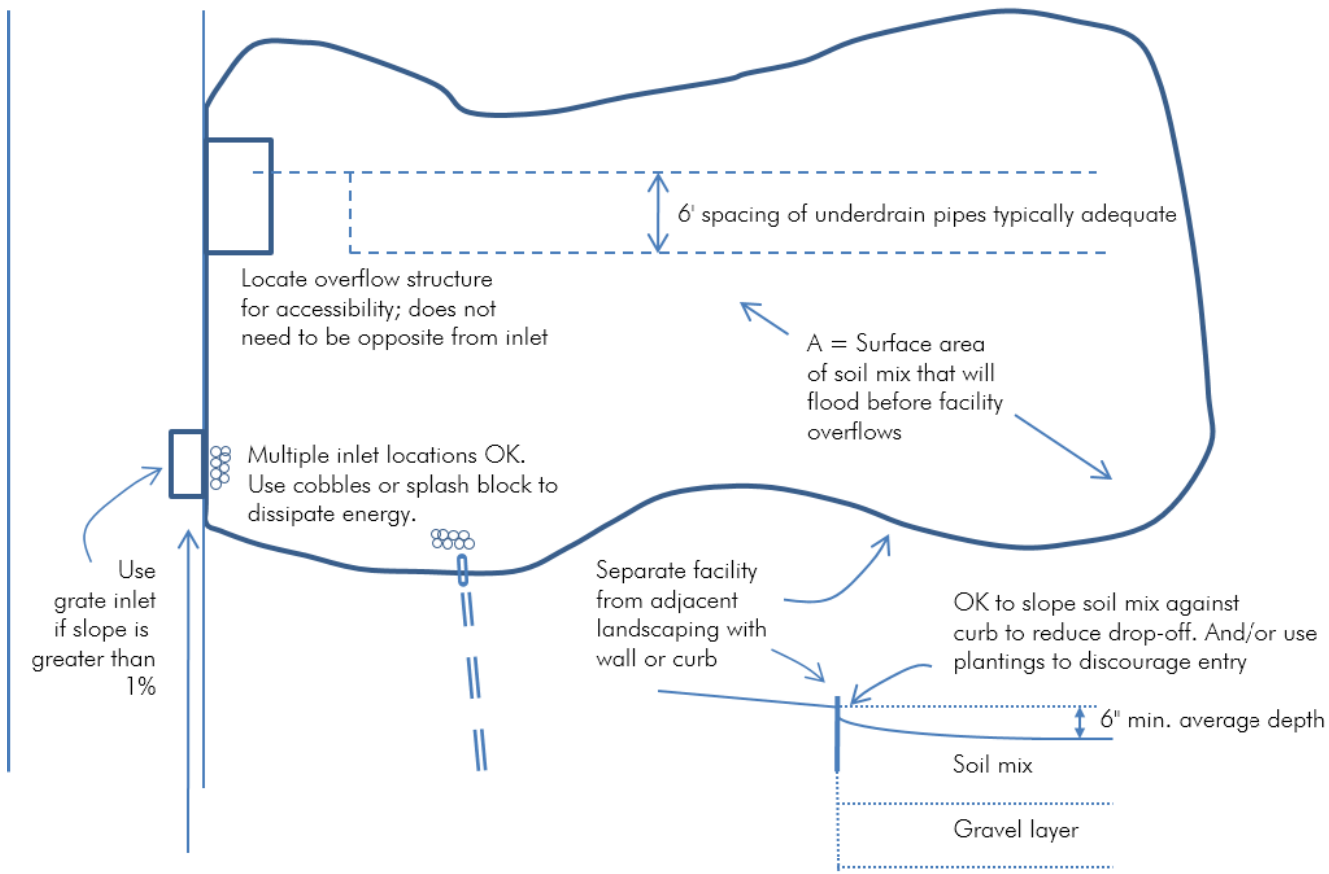


Notes:

- No liner, no filter fabric, no landscape cloth.
- Maintain BGL. TGL, TSL throughout facility area at elevations to be specified in plan.
- Class 2 permeable material layer may extend below and underneath drop inlet.
- Elevation of underdrain discharge is at top of gravel layer.
- See Chapter 4 for instructions on facility sizing and additional specifications.

Bioretention Facility

Plan (Not to Scale)



Note: Call out elevations of curb, pavement, inlet, top of soil layer (TSL), bottom of soil layer (BSL), and bottom of gravel layer (BGL) at all inlets and outlets and at key points along edge of facility.

Design Criteria for Porous Pavements

The following minimum design criteria must be followed where porous pavements are used as a site design measure for Tier 1 projects, or a self-retaining area for Tier 2 and 3 projects.

- ❑ No erodible areas drain on to permeable pavement.
- ❑ Subgrade compaction is minimal.
- ❑ Reservoir base course is of open-graded crushed stone. Base depth (3" or more) is adequate to retain rainfall and support design loads (more depth may be required).
- ❑ No subdrain is included or, if a subdrain is included, outlet elevation is a minimum of 3 inches above bottom of base course.
- ❑ Subgrade is level and slopes are not so steep that subgrade is prone to erosion.
- ❑ Rigid edge is provided to retain granular pavements and unit pavers.
- ❑ Solid unit pavers, if used, are set in sand or gravel with minimum 3/8 inch gaps between the pavers. Joints are filled with an open-graded aggregate free of fines.
- ❑ Permeable concrete or porous asphalt, if used, are installed by industry-certified professionals according to the vendor's recommendations.
- ❑ Selection and location of pavements incorporates Americans with Disabilities Act requirements (if applicable), site aesthetics, and uses.

CHAPTER 5

PREPARING YOUR BIORETENTION FACILITIES OPERATION & MAINTENANCE PLAN

Introduction

LID facilities—and in particular, bioretention facilities—require little care beyond normal maintenance and periodic rejuvenation of the landscaping.

However, applicants must verify provisions have been made for maintenance of the LID facilities in perpetuity.

This verification is accomplished by executing and recording an agreement that "runs with the land." The agreement provides the municipality a right of access for inspections and requires the owner to certify annually that facilities have been recently inspected and are functioning as intended. If maintenance is not adequate, the municipality may conduct any maintenance or repairs needed and bill the owner to recover costs. The agreement is binding on future owners of the entire property or any subdivided portion of the property. A model agreement is available at the Project Clean Water website.

When facilities are located in a privately owned common area, such as street or landscaped area within a residential subdivision, the joint responsibilities of the property owners must be spelled out in codes, covenants, and restrictions (CC&Rs).

Your Operation and Maintenance Plan (O&M Plan) will address the specific drainage patterns and treatment facilities on the development site and is typically referenced in the agreement or attached as an exhibit. The O&M Plan is used to plan, direct, and record maintenance of the SCMs. The O&M Plan is kept on-site, and a copy maintained at municipal offices.

Updated information, including contact information, must be provided to the municipality whenever a property is sold and whenever responsibility for maintenance is changed.

Step by Step

Follow these five steps to prepare your O&M Plan.

Step 1: Designate Responsible Individuals

Step 2: Describe the Facilities

Step 3: Document the Facilities "As Built"

Step 4: Schedule Maintenance Activities

Step 5: Compile the Plan

1. Designate Responsible Individuals.

Identify the following individuals:

- Person who will have direct responsibility for the maintenance of stormwater controls, maintain self-inspection records, and sign any correspondence with the municipality regarding the inspections.

- Employees or contractors who will report to the designated contact and are responsible for carrying out maintenance.
- Contact for response to problems, such as clogged drains or broken irrigation mains, that would require immediate response should they occur during off-hours.

Describe the methods and schedule of initial training for staff or contractors regarding the purpose, mode of operation, and maintenance requirements for the facilities on the site.

2. Describe the Facilities to be Maintained

Incorporate the following into the O&M Plan:

- Figures from your Stormwater Control Plan delineating the Drainage Management Areas on the site and showing the locations of the bioretention facilities.
- The tabulation of the Drainage Management Areas from the calculations in your Stormwater Control Plan.

3. Document Facilities "As Built"

Include from the final construction drawings:

- Plans, elevations, and details of the bioretention facilities. If necessary, annotate the drawings with the designations used in the Stormwater Control Plan so it is clear which drawing refers to which facility.
- Construction details and specifications, including depths of sand or soil, compaction, pipe materials, and bedding.
- Location and layouts of inflow piping and piping to off-site discharge.
- Native soils encountered (e.g., sand or clay lenses beneath or near facilities).

Municipalities may require a *draft* Operations and Maintenance Plan be submitted when building permits are applied for — or even before.

Changes made in the field during construction should be noted in the *final* Plan following construction.

4. Schedule Maintenance Activities

The following activities should be scheduled at least annually. The frequency should be adjusted in response to the needs of each particular facility.

Clean up. Remove any soil or debris blocking planter inlets or overflows. Remove trash that typically collects near inlets or gets caught in vegetation.

Prune or cut back plants for health and to ensure flow into inlets and across the surface of the facility. Remove and replant as necessary. When replanting, maintain the design surface elevation and minimize the introduction of soil.

Control weeds by manual methods and soil amendment. In response to problem areas or threatening invasions, corn gluten, white vinegar, vinegar-based products such as Burnout, or non-selective natural herbicides such as Safer's Sharpshooter may be used.

Add mulch. Aged mulch, also called compost mulch, reduces the ability of weeds to establish, keeps soil moist, and replenishes soil nutrients. Mulch may be added from time to time to maintain a mulch layer thickness of 1" to 2", but only if the underlying soil surface beneath the mulch layer is a minimum 6" below the overflow elevation, consistently throughout the surface area of the facility.

"Municipalities will typically require a draft Operations and Maintenance Plan be submitted when building permits are applied for — or even before."

Check signage. Remove graffiti and replace if necessary.

Check irrigation, if any, to confirm it is adequate but not excessive.

Landscape maintenance personnel should be aware of the following:

Do not add fertilizer to bioretention facilities. Compost tea, available from various nurseries and garden supply retailers, may be applied at a recommended rate of 5 gallons mixed with 15 gallons of water per acre, up to two weeks prior to planting and once per year between March and June. Do not apply when temperatures are below 50°F or above 90°F or when rain is forecast in the next 48 hours.

Do not use synthetic pesticides on bioretention facilities. Beneficial nematodes and non-toxic controls may be used. Acceptable natural pesticides include Safer® products and Neem oil.

5. Compiling the Plan

Format plans to 8½" x 11" where possible to facilitate duplication, filing, and handling. Include the revision date in the footer of each page.

Consider scanning the graphics and incorporating with the text in electronic files that can be backed up.

The following resources at the Project Clean Water website may help you when preparing your plan:

- Sample outline and format for an O&M Plan.
- Form for designating individuals responsible for operation and maintenance.
- Sample facility inspection and maintenance log.
- Sample contents of an inspector's report.

Updates to the O&M Plan

Updates can be made, and a copy transmitted to the municipality, at any time. In particular, contact information should be updated timely.

The O&M Plan should be reviewed annually and updated as needed.

Appendix A. Stormwater Pollutant Sources/Source Controls Checklist

How to use this worksheet (also see instructions on page 3-6 of the *Stormwater Technical Guide*):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your Stormwater Control Plan drawings.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in a table in your Stormwater Control Plan. Use the format shown in Table 3-1 on page 3-6 of the *Stormwater Technical Guide*. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Strucutral/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **A.** On-site storm drain inlets (unauthorized non-stormwater discharges and accidental spills or leaks)	❑ Locations of inlets.	❑ Mark all inlets with the words "No Dumping! Flows to Bay" or similar.	❑ Maintain and periodically repaint or replace inlet markings. ❑ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ❑ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ❑ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Strucutral/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **B.** Interior floor drains and elevator shaft sump pumps		❑ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **C.** Interior parking garages		❑ State that parking garage floor drains will be plumbed to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **D_1.** Need for future indoor & structural pest control		❑ Note building design features that discourage entry of pests.	❑ Provide Integrated Pest Management information to owners, lessees, and operators.
❑ **D_2.** Landscape/ Outdoor Pesticide Use/Building and Grounds Maintenance	❑ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ❑ Show self-retaining landscape areas, if any. ❑ Show stormwater treatment and retention SCMs. (See instructions in Chapter 4.)	State that final landscape plans will accomplish all of the following. ❑ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ❑ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. ❑ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. ❑ Consider using pest-resistant plants, especially adjacent to hardscape. ❑ To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	❑ Maintain landscaping using minimum or no pesticides. ❑ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ❑ Provide IPM information to new owners, lessees and operators.

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Strucutral/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **E.** Pools, spas, ponds, decorative fountains, and other water features.	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	❑ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ **F.** Food service	❑ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	❑ Describe the location and features of the designated cleaning area. ❑ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Strucutral/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **G.** Refuse areas	❑ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ❑ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. ❑ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	❑ State how site refuse will be handled and provide supporting detail to what is shown on plans. ❑ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	❑ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ **H.** Industrial processes.	❑ Show process area.	❑ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Strucutral/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ❑ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. ❑ Where appropriate, reference documentation of compliance with the requirements of programs for: Hazardous Waste Generation Hazardous Materials Release Response and Inventory California Accidental Release (CalARP) Aboveground Storage Tank Uniform Fire Code Article 80 Section 103(b) & (c) 1991 Underground Storage Tank	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Strucutral/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **J.** Vehicle and Equipment Cleaning	❑ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle/ equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	❑ If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ❑ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. ❑ Car dealerships and similar may rinse cars with water only. See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Strucutral/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **K.** Vehicle/Equipment Repair and Maintenance	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
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❑ **L.** Fuel Dispensing Areas	❑ Fueling areas1 shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ❑ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		❑ The property owner shall dry sweep the fueling area routinely. ❑ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[1] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 Potential Sources of Runoff Pollutants	**2** Strucutral/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
❑ **M.** Loading Docks	❑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. ❑ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ❑ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ **N.** Fire Sprinkler Test Water		❑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	❑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

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1 Potential Sources of Runoff Pollutants	**2** Strucutral/Permanent Controls—Show on Stormwater Control Plan Drawings	**3** Structural/Permanent Controls—List in Stormwater Control Plan Table and Narrative	**4** BMPs—Include in Stormwater Control Plan Table and Narrative
O. Miscellaneous Drain or Wash Water or Other Sources ❑ Boiler drain lines ❑ Condensate drain lines ❑ Rooftop equipment ❑ Drainage sumps ❑ Roofing, gutters, and trim. ❑ Other sources		❑ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ❑ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ❑ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ❑ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ❑ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. ❑ Include controls for other sources as specified by local reviewer.	
❑ **P.** Plazas, sidewalks, and parking lots.			❑ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Appendix B. Bioretention Construction Inspection Checklist

Layout (to be confirmed prior to beginning excavation)

- ❒ Square footage of the facility meets or exceeds minimum shown in Stormwater Control Plan
- ❒ Site grading and grade breaks are consistent with the boundaries of the tributary Drainage Management Area(s) (DMAs) shown in the Stormwater Control Plan
- ❒ Inlet elevation of the facility is low enough to receive drainage from the entire tributary DMA
- ❒ Locations and elevations of overland flow or piping, including roof leaders, from impervious areas to the facility have been laid out and any conflicts resolved
- ❒ Rim elevation of the facility is laid out to be level all the way around, or elevations are consistent with a detailed cross-section showing location and height of interior dams
- ❒ Locations for vaults, utility boxes, and light standards have been identified so that they will not conflict with the facility
- ❒ Location for signage is identified
- ❒ Facility is protected as needed from construction-phase runoff and sediment

Excavation (to be confirmed prior to backfilling or pipe installation)

- ❒ Excavation conducted with materials and techniques to minimize compaction of soils within the facility area
- ❒ Excavation is to accurate area and depth
- ❒ Slopes or side walls protect from sloughing of native soils into the facility
- ❒ Vertical moisture barrier, if specified, has been added to protect adjacent pavement or structures.
- ❒ Native soils at bottom of excavation are ripped or loosened to promote infiltration

Overflow or Surface Connection to Storm Drainage

(to be confirmed prior to backfilling with any materials)

- ❒ Overflow is at specified elevation
- ❒ No knockouts or side inlets are in overflow riser
- ❒ Overflow location selected to minimize surface flow velocity (near, but offset from, inlet recommended)
- ❒ Grating excludes mulch and litter (beehive or atrium-style grates with ¼" openings recommended)
- ❒ Overflow is connected to storm drain via appropriately sized piping

Underground connection to storm drain/outlet orifice

(to be confirmed prior to backfilling with any materials)

- ❒ Perforated pipe underdrain (PVC SDR 35 or approved equivalent) is installed with holes facing down
- ❒ Perforated pipe is connected to storm drain at specified elevation (typ. bottom of soil elevation)
- ❒ Cleanouts are in accessible locations and connected via sweep bends
- ❒ Monitoring well, if required, is installed.
- ❒ Structures (arches or large diameter pipes) for additional surface storage are installed as shown in plans and specifications and have the specified volume

Drain Rock/Subdrain (to be confirmed prior to installation of soil mix)

- ❒ Rock is installed as specified. Class 2 permeable, Caltrans specification 68-2.02(F)(3) recommended, or 4"-6" depth of pea gravel is installed at the top of the crushed rock layer to prevent migration of fines into gravel layer
- ❒ Rock is smoothed to a level top elevation. Depth and top elevation are as shown in plans
- ❒ Slopes or side walls protect from sloughing of native soils into the facility
- ❒ No filter fabric is placed between the subdrain and soil mix layers

Soil Mix

- ❒ Soil mix is as specified.
- ❒ Mix installed in lifts not exceeding 12"
- ❒ Mix is not compacted during installation but may be thoroughly wetted to encourage consolidation
- ❒ Mix is smoothed to a level top elevation. Depth of mix (24" min.) and top elevation are as shown in plans, accounting for depth of mulch to follow and required reservoir depth

Irrigation

- ❒ Irrigation system is installed so it can be controlled separately from other landscaped areas. Smart irrigation controllers and drip emitters are recommended
- ❒ Spray heads, if any, are positioned to avoid direct spray into outlet structures

Planting

- ❒ Plants are installed consistent with approved planting plan
- ❒ Any trees and large shrubs are staked securely
- ❒ No fertilizer is added; compost tea may be used
- ❒ No native soil or clayey material are imported into the facility with plantings
- ❒ 1"-2" mulch may be applied following planting; mulch selected to avoid floating
- ❒ Final elevation of soil mix maintained following planting
- ❒ Curb openings are free of obstructions

Final Engineering Inspection

- ❒ Drainage Management Area(s) are free of construction sediment and landscaped areas are stabilized
- ❒ Inlets are installed to ensure entry of runoff from adjoining pavement, have sufficient reveal (drop from the adjoining pavement to the top of the mulch or soil mix, and are not blocked
- ❒ Rock or other energy dissipation at piped or surface inlets is adequate
- ❒ Inflows from roof leaders and pipes are connected and operable
- ❒ Temporary flow diversions are removed
- ❒ Overflow outlets are configured to allow the facility to flood and fill to near rim before overflow
- ❒ Plantings are healthy and becoming established
- ❒ Irrigation is operable
- ❒ Facility drains rapidly; no surface ponding is evident
- ❒ Any accumulated construction debris, trash, or sediment is removed from facility
- ❒ Permanent signage is installed and is visible to site users and maintenance personnel

Appendix C. Technical Criteria for Non-LID Treatment Facilities

Non-LID Treatment Facilities may be either tree-box-type high-flowrate biofilters or vault-based high-flowrate media filters.

General

- Design inflow rate is that generated by a continuous rainfall intensity of 0.2 inches per hour.
- Landscape and non-impervious surfaces should be made self-treating or self-retaining and not drain to treatment facilities, if feasible.
- Use the runoff factors in Table 4-1 (on p. 4-4) of the *Stormwater Technical Guide.*
- The applicant's Stormwater Control Plan (Plan) must include, as an attachment, a letter from the manufacturer stating the manufacturer has reviewed the Plan, the proposed device meets these technical criteria, and the manufacturer will provide a warranty for two years following activation of the facility.

High-Flowrate Tree-Box-Type Biofilters

- Maximum design surface loading rate of 50 inches per hour.
- Precast concrete construction.
- Inlet design to capture flows at least up to the maximum design surface loading rate and to bypass high flows.
- Minimum media depth of 3.5 feet (may be reduced, but maintaining the same media volume, if required because of inadequate head to discharge point).
- Media and facility configuration supports a healthy tree or other vegetation.

Vault-Based High-Flowrate Media Filters

- Replaceable cartridge filters.
- Maximum design filter surface loading rate (to cartridge filters) of 1 gpm/ft2
- Storage volume detains runoff and allows settling of coarse solids prior to filtration.
- Flow through the cartridge filters is controlled by an orifice or other device so that the design surface loading rate is not exceeded.

Stormwater Control Plan

for

[Name of Project]

[date]

[This template is to be used in conjunction with the instructions, criteria, and minimum requirements in the Santa Barbara Project Clean Water *Stormwater Technical Guide*.

Check the Project Clean Water website for new information and updates to the *Stormwater Technical Guide* and this template.]

[Name of Owner]
[Owner's Representative and Contact Information]

prepared by:

[Preparer's Name]
[Preparer's Contact Information]

Table of Contents

I. Project Data 1

II. Setting 1

II.A. Project Location and Description 1

II.B. Existing Site Features and Conditions 2

II.C. Opportunities and Constraints for Stormwater Control 2

III. Low Impact Development Design Strategies 2

III.A. Optimization of Site Layout 2

III.A.1. Limitation of development envelope 2

III.A.2. Preservation of natural drainage features 2

III.A.3. Setbacks from creeks, wetlands, and riparian habitats 2

III.A.4. Minimization of imperviousness 2

III.A.5. Use of drainage as a design element 2

III.B. Use of Permeable Pavements 2

III.C. Dispersal of Runoff to Pervious Areas 2

III.D. Stormwater Control Measures 2

IV. Documentation of Drainage Design 2

IV.A. Descriptions of each Drainage Management Area 2

IV.A.1. Table of Drainage Management Areas 2

IV.A.2. Drainage Management Area Descriptions 3

IV.B. Tabulation and Sizing Calculations 3

IV.B.1. Information Summary for LID Facility Design 3

IV.B.2. Self-Treating Areas 3

IV.B.3. Self-Retaining Areas 3

IV.B.4. Areas Draining to Self-Retaining Areas 3

IV.B.5. Areas Draining to Bioretention Facilities (Tier 2 Projects) 4

V. Source Control Measures 5

V.A. Site activities and potential sources of pollutants 5

V.B. Source Control Table 5

V.C. Features, Materials, and Methods of Construction of Source Control BMPs 5

VI. Stormwater Facility Maintenance 5

VI.A. Ownership and Responsibility for Maintenance in Perpetuity 5

VI.B. Summary of Maintenance Requirements for Each Stormwater Facility 5

VII. Construction Checklist 5

VIII. Certifications 6

Tables

Table 1. Project Data x

Table x. Self-Treating Areas x

Table x. Self-Retaining Areas x

Table x. Areas Draining to Self-Retaining Areas x

Table x. LID Facility Sizing Calculations. x

Table x. Sources and Source Control Measures x

Table x. Construction Plan C.3 Checklist x

Figures

Vicinity Map x

Attachments

Stormwater Control Plan Exhibit

Appendices

This Stormwater Control Plan was prepared using the template dated 16 December 2013 [draft].

I. Project Data

Table 1. Project Data

Project Name/Number	
Application Submittal Date	[to be verified by municipal staff]
Project Location	[Street Address if available, or intersection and/or APN]
Project Phase No.	[If project is being constructed in phases, indicate the phase number. If not, enter "NA"]
Project Type and Description	[Example entries: "Detached single-family residence," "5-story office building," "Residential with 160 single-family homes," "Five 4-story buildings to contain 200 condominiums," "100-unit, 2-story shopping mall," "mixed use retail and residential development (apartments)", "Industrial warehouse."]
Total Project Site Area (acres)	
Total New Impervious Surface Area	
Total Replaced Impervious Surface Area	
Total Pre-Project Impervious Surface Area	
Total Post-Project Impervious Surface Area	
Net Impervious Area	[If Tier 2. Equals New + Replaced – (Pre – Post)]
Watershed Management Zone(s)	
Design Storm Frequency and Depth	[If Tier 3]
Urban Sustainability Area	[If Tier 3]

II. Setting

II.A. Project Location and Description

[Include site location, division of parcels, planned land uses, zoning, setback and open space requirements, project phasing, number of residential units or square footage of office or retail, parking requirements, neighborhood character, project design objectives (for example LEED certification), other notable project characteristics. A vicinity map may also be useful.]

II.B. Existing Site Features and Conditions

[Include site size, shape, and topography. Hydrologic features, including any contiguous natural areas, wetlands, watercourses, seeps or springs. Existing land uses. Soil types and hydrologic soil groups, vegetative cover, and impervious areas, if any. Wells, landslides, slumps, or rock outcrops, if any. Existing drainage for site and nearby areas, including location of municipal storm drains.]

II.C. Opportunities and Constraints for Stormwater Control

[Examples of opportunities: Existing natural areas, low areas, oddly configured or otherwise unbuildable areas, easements and required landscape amenities including open space and buffers that might be used for bioretention facilities, and differences in elevation, which can provide needed hydraulic head.]

[Examples of constraints: impermeable soils or near-surface bedrock, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, density/high-intensity land use, heavy pedestrian or vehicular traffic, utility locations, safety concerns.]

III. Low Impact Development Design Strategies

III.A. Optimization of Site Layout

III.A.1. Limitation of development envelope

III.A.2. Preservation of natural drainage features

III.A.3. Setbacks from creeks, wetlands, and riparian habitats

III.A.4. Minimization of imperviousness

III.A.5. Use of drainage as a design element

III.B. Use of Permeable Pavements

III.C. Dispersal of Runoff to Pervious Areas

III.D. Stormwater Control Measures

IV. Documentation of Drainage Design

IV.A. Descriptions of each Drainage Management Area

IV.A.1. Table of Drainage Management Areas

DMA Name	Surface Type	Area (square feet)

IV.A.2. Drainage Management Area Descriptions

DMA [name], totaling x,xxx square feet, drains [description of area]. DMA [name] drains to [Self-Retaining DMA name or SCM name]. [Describe notable or exceptional characteristics or conditions.]

DMA [name], totaling x,xxx square feet, drains [description of area]. DMA [name] drains to [Self-Retaining DMA name or SCM name]. [Describe notable or exceptional characteristics or conditions.]

DMA [name], totaling x,xxx square feet, drains [description of area]. DMA [name] drains to [Self-Retaining DMA name or SCM name]. [Describe notable or exceptional characteristics or conditions.]

DMA [name], totaling x,xxx square feet, drains [description of area]. DMA [name] drains to [Self-Retaining DMA name or SCM name]. [Describe notable or exceptional characteristics or conditions.]

IV.B. Tabulation and Sizing Calculations

IV.B.1. Information Summary for LID Facility Design

Total Project Area (Square Feet)	[should be consistent with Table 1]
Design Storm Depth	[at project site]
Applicable Requirements	Tier 2 or Tier 2/Tier 3

IV.B.2. Self-Treating Areas

[Extend table to list additional DMAs. Note: The following tables may be generated using the Project Clean Water SCM Sizing Calculator, available at http://www.sbprojectcleanwater.org.]

DMA Name	Area (square feet)

IV.B.3. Self-Retaining Areas

[Extend table to list additional DMAs. Include areas for which runoff is to harvested and used.]

DMA Name	Area (square feet)

IV.B.4. Areas Draining to Self-Retaining Areas

[Extend table to list additional DMAs.]

DMA Name	Area (square feet)	Post-project surface type	Runoff factor	Product (Area x runoff factor)[A]	Receiving self-retaining DMA	Receiving self-retaining DMA Area (square feet) [B]	Ratio [A]/[B]

IV.B.5. Areas Draining to Bioretention Facilities (Tier 2 Projects)

[Copy entire table once for each SCM.]

DMA Name	DMA Area (square feet)	Post-project surface type	DMA Runoff factor	DMA Area × runoff factor	SCM Name		
					SCM Sizing factor	Minimum SCM Size	Proposed SCM Size
Total>					0.04		

V. Source Control Measures

V.A. Site activities and potential sources of pollutants

V.B. Source Control Table

[See the instructions on page 3-6 of the *Stormwater Technical Guide* and the checklist in Appendix A.]

Potential source of runoff pollutants	Permanent source control BMPs	Operational source control BMPs

V.C. Features, Materials, and Methods of Construction of Source Control BMPs

VI. Stormwater Facility Maintenance

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

[Include (1) a commitment to execute any necessary agreements, and (2) a statement accepting responsibility for operation and maintenance of facilities until that responsibility is formally transferred.]

VI.B. Summary of Maintenance Requirements for Each Stormwater Facility

[See Chapter 5 of the *Stormwater Technical Guide*]

VII. Construction Checklist

[See the instructions on page 3-7 of the Stormwater Technical Guide.]

Stormwater Control Plan Page #	BMP Description	See Plan Sheet #s

VIII. Certifications

The preliminary design of stormwater treatment facilities and other stormwater pollution control measures in this plan are in accordance with the current edition of the Santa Barbara County Project Clean Water's Stormwater Technical Guide. [Check with local staff regarding other certification requirements.]