



**Watershed Action Plan  
Evaluation of Retrofit Sites  
for Water Quality Improvements**

May 6, 2013



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# **1 Introduction**

## **1.1 Context of Retrofit Sites Evaluation**

The Watershed Action Plan (WAP) for the San Bernardino County Flood Control District (District), the County of San Bernardino (County) and 16 cities within the County, collectively known as Co-Permittees, is a requirement of the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer (MS4) Permit No. CAS618036 and Santa Ana Regional Water Quality Control Board (RWQCB) Order R8-2010-0036 (Permit) Section XI.B. It has been developed by the County of San Bernardino Areawide Stormwater Program (Program) through a collaborative process with the Co-Permittees, and other watershed stakeholders. This System-wide Identification and Evaluation of Retrofit Sites, required in Section XI.B.3.a.ix of the Permit, was performed concurrently and is included as an Appendix to the WAP. The WAP, including this Appendix is designed to be a living document so that as more information is developed in the watershed, they can be incorporated into the document to ensure the WAP continues to be the guiding document to achieve effective Integrated Watershed Management (IWM) in the Santa Ana River (SAR) Watershed.

In Phase I of the WAP development, the Program submitted a system-wide evaluation to identify opportunities to retrofit existing stormwater conveyance systems, parks, and other recreational areas with water quality measures. This Retrofit Opportunity Study was completed and submitted to the RWQCB in May 2011. The initial evaluation of specific individual retrofit studies emphasized feasibility of implementing water quality controls for Total Maximum Daily Loads (TMDLs), hydromodification, and Low Impact Development (LID) Offset Program.

Phase II of WAP development required further evaluation and implementation of opportunities identified in the initial study. The availability, applicability to a specific water quality mitigation issue, and a cost-benefit analysis of each potential retrofit site was evaluated in the context of the water quality improvement needs of the sub-watershed and watershed.

This report initially identifies those retrofit sites that were deemed acceptable for further investigation by the Program and incorporates three individual retrofit studies specific to each programmatic water quality improvement need: TMDLs, Hydromodification Management, and LID Offset Program. For each individual retrofit study, the report defines the objectives, the technical methodology, and analyzes the results. A summary is provided in Appendix C of this report to synthesize, for each individual retrofit site, the expected water quality benefits.

## **1.2 Santa Ana River Watershed**

The Santa Ana River (SAR) Watershed is located within portions of Los Angeles, Orange, Riverside and San Bernardino County and has an area of approximately 2,650 square miles. Figure 1 shows the boundaries of the SAR Watershed within San Bernardino County.





## 2 Identification of Retrofit Opportunities

### 2.1 Summary of Retrofit Opportunity Identification - Phase I

The initial evaluation identified 144 potential retrofit opportunities using the Integrated Watershed Assessment Tool for Restoration or iWATR (RBF Consulting, 2010). The identification process was based on a desktop-level analysis, supported by the iWATR Geographic Information Systems (GIS) Watershed Analysis Tool. Several factors were considered when identifying retrofit opportunity locations in the County of San Bernardino portion of the Santa Ana River Watershed, including, but not limited to, the characteristics of the watershed, public land availability and ownership, aerial photography, topography, hydrology, existing stormwater infrastructure, and areas of anthropogenic sources of pollutants. The tool was also used to perform a preliminary assessment of the technical feasibility or site constraints, such as environmental issues, maintenance access, utility interference, and aesthetic considerations. For each retrofit opportunity identified, watershed characteristics and site constraints were considered to provide a preliminary recommendation on the most appropriate type of BMP. Based on the extent of the tributary area served, both sub-regional and regional retrofit opportunities were identified. Sub-regional retrofit opportunities were preferred for local or neighborhood drainage areas and included potential BMP types such as infiltration basins, infiltration chambers, bioretention areas, extended detention basins, wet basins/constructed wetlands, and media filters. Regional or watershed retrofit opportunities were selected for larger drainage areas and in locations where there was an opportunity to extract water from a water body or major storm drain, infiltrate or treat the water with a BMP and then discharge back into the water body or storm drain. Potential regional BMP types included infiltration basins, wet basins/constructed wetlands, subsurface wetlands, and extended detention basins.

### 2.2 Retrofit Opportunities Evaluation - Phase II

The Program reviewed the initial list of 144 potential retrofit sites in December 2012 to identify existing or future conditions that may conflict with the implementation of these retrofit sites. The list of potentially conflicting conditions included future planned development, capital improvement projects, easements, technical feasibility, and beneficial uses of the community. The assessment approved 27 sites for further study and rejected 72 sites. Out of the 144 sites initially identified by the desktop survey, 72 sites are incorporated in this Phase II evaluation. Table 1 identifies a list of 144 potential retrofit sites, specifies if a site is rejected for further analyses, and lists the specific comment, if any, provided by the jurisdiction upon review.

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**Table 1 - Evaluated Phase II Retrofit Opportunities**

Zone	Copermittee	BMP ID	BMP Type	Longitude	Latitude	Objection from Jurisdiction	Comment or Reason for Objection
1	CITY OF ONTARIO	011001310	Bioretention	-117.6269	34.0673		
1	CITY OF ONTARIO	011005159	Infiltration Basin	-117.6259	34.0658	X	
1	CITY OF ONTARIO	011031112	Infiltration Basin	-117.5971	34.0740		IEUA basin might work - others should not be used
1	CITY OF ONTARIO	011045101	Infiltration Basin	-117.5890	34.0748	X	Parks basins
1	CITY OF ONTARIO	011347203	Extended Detention Basin with Infiltration	-117.6131	34.0350		Only easement over basin #3 (IEUA owner). Why not for basins 1 and 2
2	CITY OF RIALTO	012802134	Infiltration Basin	-117.3848	34.1158		
2	CITY OF SAN BERNARDINO	013705237	Infiltration Basin	-117.3153	34.0978	X	Corps
2	CITY OF SAN BERNARDINO	014125103	Infiltration Basin	-117.3042	34.0752		
2	CITY OF SAN BERNARDINO	014218106	Infiltration Basin	-117.3498	34.0912		FC Mill basin
2	CITY OF SAN BERNARDINO	014218110	Infiltration Basin	-117.3499	34.0862		FC Randal basin
2	CITY OF SAN BERNARDINO	014722322	Bioretention	-117.2579	34.1319	X	
2	CITY OF SAN BERNARDINO	015328131	Infiltration Basin	-117.2681	34.1457		Lynwood basin (has road within basin)
2	CITY OF COLTON	016336121	Bioretention	-117.3364	34.0488	X	Delhi Fly issues
2	CITY OF COLTON	016336206	Bioretention	-117.3240	34.0478	X	Access location
2	CITY OF COLTON	016336219	Bioretention	-117.3299	34.0464	X	
2	CITY OF COLTON	016338113	Infiltration Chamber	-117.3155	34.0502		
2	CITY OF COLTON	016418236	Infiltration Basin	-117.3085	34.0660	X	
2	CITY OF COLTON	016423118	Infiltration Basin	-117.2871	34.0451	X	
2	CITY OF COLTON	016428102	Infiltration Basin	-117.3044	34.0706	X	surplus
1	CITY OF RANCHO CUCAMONGA	020118315	Extended Detention Basin with Infiltration	-117.5803	34.1442		not currently a recharge basin per Ops
1	CITY OF RANCHO CUCAMONGA	020120141	Extended Detention Basin	-117.6277	34.1337	X	Corps
1	CITY OF RANCHO CUCAMONGA	020199114	Extended Detention Basin with Infiltration	-117.5880	34.1437		Great potential - FC Alta Loma basin #1
1	CITY OF RANCHO CUCAMONGA	020727142	Media Filter	-117.6121	34.0955	X	Corps
1	CITY OF RANCHO CUCAMONGA	020833122e	Media Filter	-117.5791	34.1063	X	Corps
1	CITY OF RANCHO CUCAMONGA	020833122w	Media Filter	-117.5794	34.1063	X	Corps
1	CITY OF RANCHO CUCAMONGA	020909108	Media Filter	-117.5822	34.0990	X	Landscaped treatments are already in place
1	CITY OF RANCHO CUCAMONGA	020915124	Media Filter	-117.6087	34.0919	X	FC levee

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Zone	Copermittee	BMP ID	BMP Type	Longitude	Latitude	Objection from Jurisdiction	Comment or Reason for Objection
1	CITY OF ONTARIO	021018145	Infiltration Basin	-117.5893	34.0766		
1	CITY OF ONTARIO	021813101	Extended Detention Basin with Infiltration	-117.5990	34.0083		West side above Chris Basin only. Others are Corps basins
1	CITY OF CHINO	021830106	Extended Detention Basin	-117.6042	33.9746		w/in 200' of ESA (Delhi Sands Flower Loving Fly)
1	CITY OF RANCHO CUCAMONGA	022707113	Extended Detention Basin with Infiltration	-117.5062	34.1304		FC Victoria Basin
1	CITY OF FONTANA	022809107	Extended Detention Basin	-117.5038	34.1265	X	surplus property
1	CITY OF RANCHO CUCAMONGA	022912114	Media Filter	-117.5418	34.0990	X	Edison easement
1	CITY OF RANCHO CUCAMONGA	022928370	Infiltration Basin	-117.5306	34.0781		
1	UNINCORPORATED	022929109	Extended Detention Basin with Infiltration	-117.5113	34.0925		Hickory basin; DSOD
1	UNINCORPORATED	023010202	Extended Detention Basin with Infiltration	-117.4973	34.0948		Great potential.
1	UNINCORPORATED	023803129	Infiltration Basin	-117.5142	34.0765		
1	CITY OF FONTANA	023809104	Extended Detention Basin with Infiltration	-117.5112	34.0499		why not / natural basin
1	CITY OF ONTARIO	023812103	Extended Detention Basin with Infiltration	-117.5458	34.0426		
2	CITY OF RIALTO	024907103	Extended Detention Basin with Infiltration	-117.4019	34.0895		FC Linden Basin
2	CITY OF COLTON	025408111	Infiltration Basin	-117.3496	34.0712		
2	CITY OF RIALTO	025805111	Media Filter	-117.3681	34.0629	X	FC lot next to Rialto Channel
2	CITY OF COLTON	026006118	Infiltration Basin	-117.3646	34.0411		
2	UNINCORPORATED	026203115	Infiltration Basin	-117.3871	34.1884		
2	CITY OF RIALTO	026421317	Extended Detention Basin with Infiltration	-117.3871	34.1253		
2	CITY OF SAN BERNARDINO	026528108	Extended Detention Basin with Infiltration	-117.2964	34.1623		OK
2	CITY OF SAN BERNARDINO	026607209	Extended Detention Basin with Infiltration	-117.3366	34.1604		FC Macy basin
2	CITY OF SAN BERNARDINO	027107108	Bioretention	-117.2895	34.1610	X	
2	CITY OF SAN BERNARDINO	027214142	Infiltration Basin	-117.2507	34.1437		potential future basin site; maybe if incorporated w/ basin
2	CITY OF COLTON	027505122	Bioretention	-117.3532	34.0458	X	Santa Ana Sucker issues
2	CITY OF SAN BERNARDINO	027932160	Infiltration Basin	-117.2724	34.0981		
3	CITY OF LOMA LINDA	028309202	Bioretention	-117.2552	34.0590	X	existing managed environmental area
2	CITY OF HIGHLAND	028574212	Extended Detention Basin with Infiltration	-117.2278	34.1368		
3	CITY OF REDLANDS	029240101	Bioretention	-117.2247	34.0698	X	Ownership & Efficiency
3	CITY OF LOMA LINDA	029303231	Media Filter	-117.2263	34.0464	X	sloped area; access point for channel
3	CITY OF YUCAIPA	030113274	Infiltration Basin	-117.0971	34.0244		

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Zone	Copermittee	BMP ID	BMP Type	Longitude	Latitude	Objection from Jurisdiction	Comment or Reason for Objection
3	CITY OF YUCAIPA	030312104	Extended Detention Basin with Infiltration	-117.0551	34.0457		
3	CITY OF YUCAIPA	030315136	Infiltration Basin	-117.0453	34.0433	X	Wilson III city project
3	CITY OF YUCAIPA	030318119	Infiltration Basin	-117.0404	34.0469	X	Wilson III city project ; possible surplus property
6	CITY OF BIG BEAR LAKE	030905101	Biofiltration	-116.9015	34.2473		Not reviewed
3	CITY OF YUCAIPA	032131111	Infiltration Basin	-117.0336	34.0445	X	Oak Glen Basin already constructed / no urban runoff
1	CITY OF CHINO HILLS	100005125	Bioretention	-117.7678	33.9590	X	Insufficient ROW
1	CITY OF UPLAND	100729106	Infiltration Basin	-117.6879	34.1023	X	College Heights S/G ; surplus property
1	CITY OF MONTCLAIR	101219104	Media Filter	-117.7175	34.0593	X	Recharge basin is located d/s (Brooks)
1	UNINCORPORATED	101326117	Infiltration Chamber	-117.7257	34.0407		
1	UNINCORPORATED	102304109	Extended Detention Basin	-117.7346	34.0172	X	how will the water get in and out; downramp currently shown in area
1	CITY OF CHINO HILLS	102337170	Biofiltration	-117.7369	34.0089		
1	CITY OF CHINO HILLS	102835124	Infiltration Basin	-117.6911	33.9668		
1	CITY OF CHINO HILLS	103226113	Infiltration Basin	-117.7396	33.9825		
1	CITY OF CHINO HILLS	103260142	Bioretention	-117.7419	33.9819		NEW SITE TO INVESTIGATE (FC lot next to Carbon Canyon)
1	CITY OF CHINO HILLS	103309117	Infiltration Basin	-117.6648	33.9316		
1	CITY OF UPLAND	104712102	Extended Detention Basin with Infiltration	-117.6335	34.0908		
1	CITY OF ONTARIO	104745104	Extended Detention Basin with Infiltration	-117.6299	34.0805		Princeton basin
1	CITY OF ONTARIO	105029126	Infiltration Basin	-117.6586	34.0414		
1	CITY OF ONTARIO	105141139	Media Filter	-117.6491	34.0248	X	
1	CITY OF CHINO	105164214	Media Filter	-117.6630	34.0199	X	
1	CITY OF ONTARIO	105216106	Extended Detention Basin with Infiltration	-117.6305	34.0170		FC Grove Basin (natural, already serving its purposes)
1	CITY OF CHINO	105722118	Extended Detention Basin with Infiltration	-117.6235	33.9323	X	Sensitive (protected) habitat for Least Bells Vireo
1	CITY OF RANCHO CUCAMONGA	106121125	Media Filter	-117.6208	34.1616	X	Entrance to Carnelian Channel
1	CITY OF RANCHO CUCAMONGA	106164106	Extended Detention Basin	-117.6113	34.1534	X	Park
1	CITY OF RANCHO CUCAMONGA	106233221	Media Filter	-117.6294	34.1383	X	
1	CITY OF RANCHO CUCAMONGA	107419132	Media Filter	-117.5879	34.1576	X	Always scoured when stormy
1	CITY OF RANCHO CUCAMONGA	108902101	Extended Detention Basin with Infiltration	-117.5431	34.1323		
1	CITY OF RANCHO CUCAMONGA	108903114	Extended Detention Basin	-117.5396	34.1244	X	too small
2	CITY OF GRAND TERRACE	116715111	Media Filter	-117.3293	34.0285	X	

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3	CITY OF YUCAIPA	7th Street Park	Infiltration Basin	-117.0628	34.0277		Not reviewed
2	CITY OF FONTANA	Almeria_F	Infiltration Basin	-117.4605	34.1219		
2	CITY OF RIALTO	Anderson Park	Infiltration Basin	-117.3806	34.0882	X	Completed recreational facility for disadvantaged community
2	CITY OF SAN BERNARDINO	Anne Shirrells Park	Infiltration Basin	-117.3304	34.1233		
1	CITY OF FONTANA	Aquatic_F	Infiltration Chamber	-117.4662	34.1516		
3	CITY OF LOMA LINDA	Baseball Field Park	Infiltration Basin	-117.2445	34.0537	X	Baseball field should remain intact
3	CITY OF LOMA LINDA	Bryn Mawr Veterans Memorial Park	Infiltration Chamber	-117.2345	34.0498		OK
2	CITY OF FONTANA	Catawba_F	Infiltration Basin	-117.4596	34.0463		
1	CITY OF ONTARIO	Centennial_O	Biofiltration	-117.6407	34.0199		OK
1	CITY OF RANCHO CUCAMONGA	Central_RC	Infiltration Basin	-117.5680	34.1235	X	City parks are not available for retrofitting
1	CITY OF RANCHO CUCAMONGA	Church_RC	Media Filter	-117.5826	34.1151	X	City parks are not available for retrofitting
1	CITY OF CHINO HILLS	Community_CH	Infiltration Basin	-117.7336	33.9922	X	Area configuration not appropriate for infiltration
1	CITY OF CHINO HILLS	Crossroads_CH	Infiltration Basin	-117.7457	33.9833	X	Extensive community use
1	CITY OF CHINO	CypressTrails_C	Extended Detention Basin	-117.6622	34.0034	X	City parks are not available for retrofitting
1	CITY OF RANCHO CUCAMONGA	DayCreek_RC	Bioretention	-117.5362	34.1447	X	City parks are not available for retrofitting
3	CITY OF LOMA LINDA	Elmer Digno Park	Infiltration Basin	-117.2611	34.0562		OK
1	CITY OF CHINO HILLS	English_CH	Wet Pond	-117.7567	33.9952	X	English Spring Park Lake – already a basin
1	CITY OF UPLAND	Fern_U	Infiltration Basin	-117.6565	34.0927	X	
3	CITY OF REDLANDS	Ford Park	Infiltration Basin	-117.1620	34.0441	X	Cost / Limited BMP Size / Extensive Community Use
2	CITY OF COLTON	George E. Brown Jr. Park	Infiltration Basin	-117.3582	34.0767		
1	CITY OF CHINO HILLS	Hickory_CH	Infiltration Basin	-117.7155	33.9739	X	
1	CITY OF FONTANA	Hunters_F	Infiltration Chamber	-117.4824	34.1600		
3	CITY OF REDLANDS	Jennie Davis Park	Infiltration Basin	-117.1946	34.0588	X	Cost / Limited BMP Size / Located in 100-yr Flood Zone / Flowline Elevation Issues
1	CITY OF RANCHO CUCAMONGA	Kenyon_RC	Media Filter	-117.5559	34.1326	X	City parks are not available for retrofitting
1	CITY OF FONTANA	Koehler_F	Infiltration Basin	-117.4706	34.1307		
1	CITY OF RANCHO CUCAMONGA	Lions_RC	Bioretention	-117.6043	34.1203	X	City parks are not available for retrofitting
2	CITY OF SAN BERNARDINO	Littlefield-Shultis Memorial Park	Infiltration Basin	-117.3463	34.1817		
1	CITY OF FONTANA	McDermott_F	Infiltration Basin	-117.5007	34.1210		
2	CITY OF SAN BERNARDINO	Meadowbrook Park	Infiltration Basin	-117.2864	34.1038		
1	CITY OF ONTARIO	MotorSpeedway_O	Extended Detention Basin	-117.5818	34.0747	X	Used for youth sports programs & shared with school

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2	CITY OF SAN BERNARDINO	Nunez_Park	Infiltration Basin	-117.3266	34.1077		
1	CITY OF FONTANA	Oak_F	Infiltration Basin	-117.4968	34.0355		
1	CITY OF CHINO HILLS	OakRidge_CH	Infiltration Basin	-117.7390	33.9737	X	Extensive community use
1	CITY OF RANCHO CUCAMONGA	OldTown_RC	Extended Detention Basin	-117.5860	34.0926	X	City parks are not available for retrofitting
2	CITY OF SAN BERNARDINO	Perris Hill Park	Infiltration Basin	-117.2714	34.1355		
1	CITY OF CHINO HILLS	Prado_C	Extended Detention Basin with Infiltration	-117.6716	33.9520	X	Lies within undeveloped / protected area
1	CITY OF RANCHO CUCAMONGA	RalphLewis_RC	Bioretention	-117.5620	34.1092	X	City parks are not available for retrofitting
1	CITY OF ONTARIO	Ranch_O	Biofiltration	-117.5903	34.0101		OK
1	CITY OF RANCHO CUCAMONGA	RedHill_RC	Bioretention	-117.6130	34.1166	X	City parks are not available for retrofitting
3	CITY OF REDLANDS	Redlands Country Club	Bioretention	-117.1510	34.0257	X	Ownership & Cost
3	CITY OF REDLANDS	Redlands Sports Park	Bioretention	-117.1475	34.0787	X	Cost & Efficiency
1	CITY OF CHINO HILLS	Rincon_CH	Infiltration Basin	-117.7107	33.9603	X	Undeveloped / Protected floodplain
1	CITY OF ONTARIO	SanAntonio_O	Infiltration Basin	-117.6600	34.0683	X	CIP projects planned & adjacent residential areas
1	CITY OF FONTANA	SanSevaine_F	Infiltration Chamber	-117.4856	34.1554		
1	CITY OF MONTCLAIR	Saratoga_M	Extended Detention Basin	-117.6875	34.0660	X	Park to be retrofitted with WQMP
1	CITY OF UPLAND	SierraVista_U	Infiltration Basin	-117.6477	34.1176	X	
1	CITY OF FONTANA	Southridge_F	Infiltration Basin	-117.4842	34.0405		
2	CITY OF SAN BERNARDINO	Speicher Park	Infiltration Basin	-117.2338	34.1235		
1	CITY OF RANCHO CUCAMONGA	Spruce_RC	Extended Detention Basin	-117.5682	34.1139	X	City parks are not available for retrofitting
1	CITY OF CHINO HILLS	Strickling_CH	Infiltration Basin	-117.7254	33.9700		
1	CITY OF FONTANA	SummitHeights_F	Infiltration Basin	-117.4750	34.1451		
1	CITY OF MONTCLAIR	Sunset_M	Bioretention	-117.7098	34.0702	X	Park to be retrofitted with WQMP
2	CITY OF FONTANA	Sycamore_F	Infiltration Basin	-117.4295	34.0536		
3	CITY OF REDLANDS	Sylvan Park	Infiltration Basin	-117.1682	34.0596	X	Cost & Limited BMP Size
2	City of San Bernardino	Verdemont Park	Infiltration Basin	-117.3674	34.2000		
1	City of Chino	Villa_C	Bioretention	-117.6958	34.0066	X	City parks are not available for retrofitting
1	City of Montclair	Wilderness_M	Extended Detention Basin	-117.7040	34.0802	X	Recharge basin
3	City of Yucaipa	Yucaipa Valley Golf Club	Infiltration Basin	-117.0706	34.0366		Not reviewed
3	City of Yucaipa	Yucaipa Equestrian Center	Infiltration Basin	-117.0345	34.0135		Not reviewed



### 3 Total Maximum Daily Loads Specific Retrofit Study

The Permit identifies in Section F of its Findings the active TMDLs and the Clean Water Act 303(d) listed waterbodies within the permitted area. For each approved TMDL, an implementation plan along with waste load allocations or load allocations have been established based on the adopted SAR Basin Plan, as well as technical studies that identify and compare natural and anthropogenic conditions for the development of the TMDL. Approved TMDLs include temporal milestones, at which specific load or concentration-based reductions must be accomplished in a comprehensive approach led by the stakeholders.

This effort investigates and quantifies the benefits, if any, of implementing potential retrofit BMPs towards meeting TMDL milestones on an individual basis. Similarly, the assessment investigates the benefits of implementing BMP retrofit sites towards meeting the requirements of likely to be approved TMDLs. A total of two approved TMDLs and one TMDL under development are evaluated in this study.

This section presents a brief overview of each approved, or likely to be approved, TMDL in the Santa Ana Region of San Bernardino County, and identifies the ramifications and waste load allocations included in the TMDL-specific implementation plan, as well as in associated technical reports. For each TMDL, a description of the methodology that is used to assess the benefits of implementing each individual retrofit site is provided.

#### 3.1 Middle Santa Ana River Bacterial Indicator TMDL for dry-weather conditions

The Permit explicitly includes Middle Santa Ana River (MSAR) Bacterial Indicator TMDL implementation requirements for dry-weather conditions. The MSAR Bacterial Indicator TMDL was approved on May 16, 2007 by the EPA Region 9 and establishes wasteload allocations for urban dischargers and confined animal feeding operation discharges and load allocations for agricultural and natural sources, as follows:

- Fecal coliform: 5-sample/30-day logarithmic mean (or geometric mean) less than 180 organisms/100 mL and not more than 10 percent of the samples exceed 360 organisms/100 mL for any 30-day period.
- E. coli: 5-sample/30-day logarithmic mean (or geometric mean) less than 113 organisms/100 mL and not more than 10 percent of the samples exceed 212 organisms/100 mL for any 30-day period.

Compliance with the wasteload and load allocations is required by year 2019.

##### 3.1.1 Criteria and Thresholds

As part of the implementation tasks to ensure compliance with the numeric targets, wasteload allocations, and load allocations, the Program developed and submitted to the RWQCB a Comprehensive Bacterial Reduction Plan (CBRP) in June 2011. The CBRP provides a comprehensive plan for attaining compliance with the MSAR TMDL by integrating existing control programs and efforts with new Permit mandates and other additional activities necessary to address controllable urban sources of bacterial indicators.



The implementation of the CBRP relies on a step-wise approach that implements key actions to identify controllable urban sources of bacterial indicators, evaluate and select a mitigation alternative, and, where necessary, construct structural BMPs to mitigate controllable sources. This pragmatic approach is a direct extension of the already RWQCB-approved watershed-wide compliance monitoring program, Urban Source Evaluation Plan (USEP), and framework being established by the Stormwater Quality Standards Task Force (SWQSTF). Coupled with this pragmatic approach is the incorporation of existing and relevant Permit requirements. These requirements are supplemented, where needed, to target controllable urban sources of bacterial indicators.

The approach incorporates three distinct steps:

- Step 1 – Identify, Prioritize, and Evaluate MS4 Dry Weather Flow Sources.
- Step 2 – Evaluate and Select Structural BMP Projects
- Step 3 – Construct Structural BMP Projects

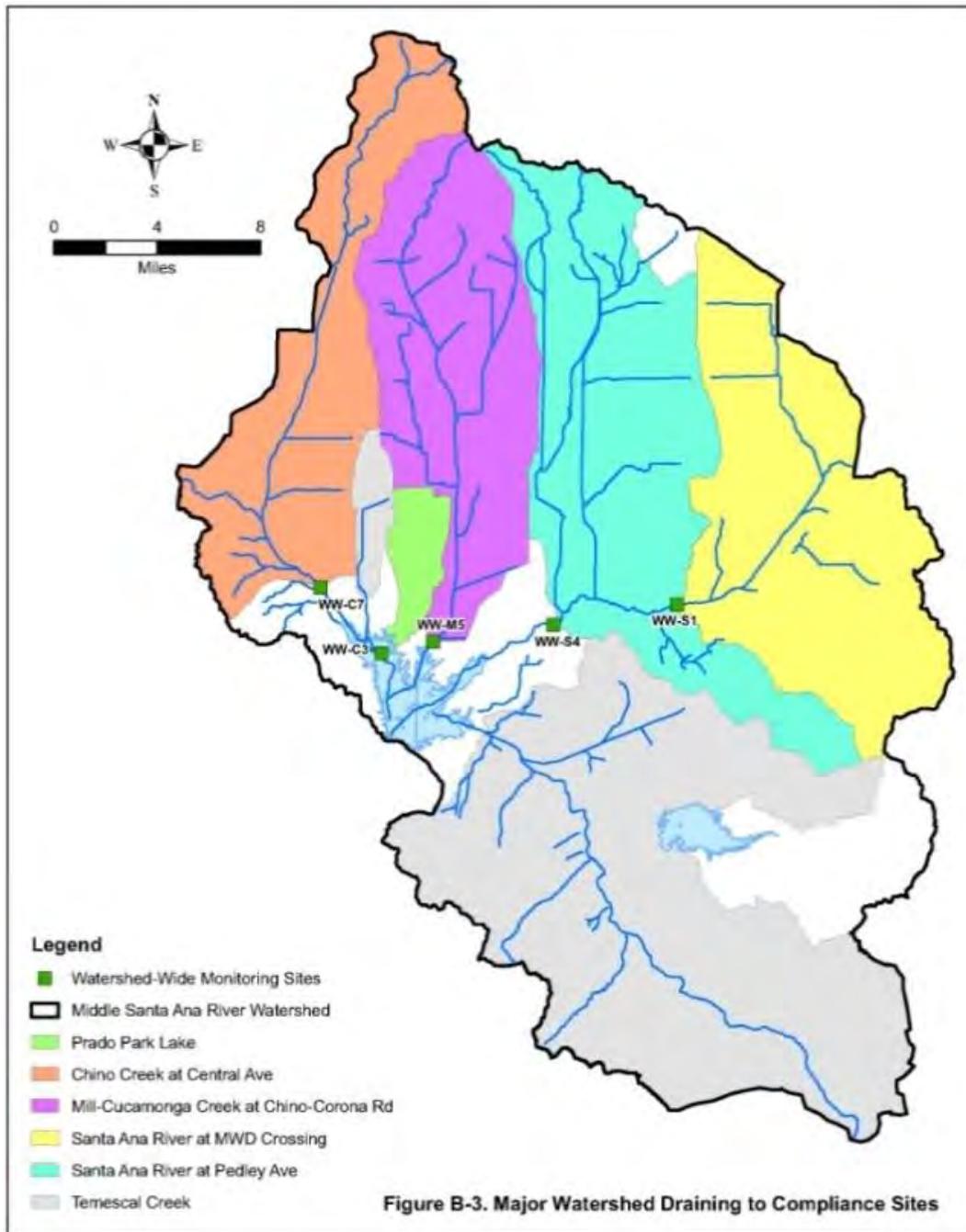
Permit requires the Program to establish a long-term plan to achieve compliance. The CBRP identifies that the Permittees have opted for the option to demonstrate compliance through a sufficient reduction in controllable urban sources of bacteria indicator loads in dry-weather flow from MS4 facilities. The sufficient reduction is to be demonstrated at each of the five downstream watershed-wide compliance monitoring sites. Required bacterial indicator reductions are determined by comparing baseline E. coli loads at the watershed-wide compliance sites with the TMDL numeric target (product of dry-weather flow at compliance monitoring site and E. coli concentration equal to the water quality objective of 126 cfu/100 mL). The five locations for compliance monitoring, as identified in the CBRP, are, as follows:

- Chino Creek at Central Avenue (WW-C7) – No portion of this subwatershed is in Riverside County;
- Mill-Cucamonga Creek at Chino-Corona Road (WW-M5) – With the exception of a small area in Riverside County, drainage area is mostly in San Bernardino County;
- Santa Ana River at MWD Crossing (WW-S1) – Areas of both Riverside and San Bernardino Counties drain to this site;
- Santa Ana River at Pedley Avenue (WW-S4) - Areas of both Riverside and San Bernardino Counties drain to this site;
- Prado Park Lake (WW-C3) – Entire drainage area to this location is in San Bernardino County.

The location of the five points of compliance is exhibited in Figure 2.



Figure 2 - CBRP Dry-weather runoff monitoring compliance points



This investigation identifies an expected reduction in E. Coli concentration and annual loading based on the existing built watershed and land uses corresponding to the implementation of each individual retrofit BMP, as well as its the proximity to the downstream compliance point. The investigation quantifies these expected reductions.



### 3.1.2 Data Sources

A number of key data pertaining to the MSAR watershed was gathered in order to quantify the drainage area being mitigated, as well as the expected pollutant concentrations and loadings. The analysis builds upon the findings and data collected during the Phase I Retrofit Study. Data was compiled during the desktop analysis with the assistance of the Program, and include:

- USGS topography, or 30-foot contours, was used to delineate the drainage area tributary to each retrofit site;
- Area-weighted dry-weather flow and expected E. Coli concentrations observed in dry-weather runoff for different tributary systems of the MSAR watershed. Baseline dry-weather flows and E.Coli concentrations are based on monitoring data compiled for the purpose of the CBRP;
- Watershed mapping and monitoring compliance locations as identified in the TMDL Technical Report, Figure B-3;
- Typical BMP removal performance and expected effluent concentrations that derive from the December 2012 International BMP Database.

### 3.1.3 Methodology for E Coli

For each individual retrofit site, a stepwise analysis was performed to quantify an expected reduction, if any, in concentration and load of E. Coli caused by the implementation of a structural BMP. The different steps of the analysis are described below:

- Step 1 – Based on the location of the individual retrofit site, is the site is subject to the requirements of the MSAR Bacterial Indicator TMDL.
- Step 2 – Compute an expected dry-weather flow and associated influent E. Coli concentration for the tributary drainage system that is adjacent to the identified retrofit site. The identification is based on the summary for area-weighted dry-weather flows and E. Coli concentrations listed on page 3-6 of the CBRP.

$$\text{Daily } DWF_{\text{retrofit}} = DWF_{\text{ave,sub}} \times TDA_{\text{retrofit}}$$

Where:

- Daily  $DWF_{\text{retrofit}}$  is the daily dry-weather runoff expected for the tributary drainage adjacent to the retrofit site (gallons per day)
- $DWF_{\text{ave,sub}}$  is the expected area-weighted dry-weather flow for the identified subwatershed (gallons per day per acre)
- $TDA_{\text{retrofit}}$  is the total drainage area tributary to retrofit site (in acre)
- Step 3 – Determine if one of the five monitoring compliance points that corresponds to the compliance point is located directly downstream of the evaluated retrofit site. The proximity to this monitoring compliance point is evaluated based on the engineer's best professional judgment. The uncertainty associated with potential bacteria regrowth could limit the benefits of reducing pollutant loadings if a retrofit site is arbitrarily distant by more than 3,000 feet from the downstream compliance point.



- Step 4 – Compare the expected influent concentration for E. Coli in the tributary drainage system to the expected effluent concentration based on the statistical findings of the 2012 International BMP Database for the selected structural treatment BMP. Table 2 summarizes E. Coli influent and effluent statistics associated with each BMP.

**Table 2- E. Coli Influent and Effluent Summary Statistics for Structural BMPs (2012 International BMP Database)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Biofiltration	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	3990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	1300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	2800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

- Step 5 – Based on the findings of the comparison between expected influent and effluent E. Coli concentrations to and from the retrofit site, an annual load reduction for E. Coli is computed. The estimate accounts for the treatment capacity of the BMP and for the number of days of dry-weather flow per year. The percentage of dry-weather runoff being treated corresponds to the daily treatment capacity of a structural BMP over the average daily dry-weather flow in the tributary drainage system adjacent to the site. Similarly, an analysis of continuous hourly rainfall data collected from 1929 through 2008 at the Redlands meteorological station (ID#047306) helped identify the number of days of dry-weather flow to 315 per year. The annual load reduction of E.Coli, if any, is quantified per the following equation:

$$\begin{aligned}
 \text{Load Reduction}_{E.Coli,retrofit} &= (\# \text{ DWF days}) \times (\text{Capture DWF}) \times \text{Daily DWF}_{retrofit} \\
 &\times (C_{in} - C_{eff})_{E. Coli}
 \end{aligned}$$

Where:

- Load Reduction<sub>E. Coli, retrofit</sub> is the estimated annual load reduction of E. Coli (cfu)
- (# DWF days) is the number of days with expected dry-weather runoff (315)
- (Capture DWF) is expressed in percentage and corresponds to the capacity of treating daily dry-weather runoff
- Daily DWF<sub>retrofit</sub> is the daily dry-weather runoff expected for the tributary drainage adjacent to the retrofit site, as identified in Step 2 (gallons per day)
- TDA<sub>retrofit</sub> is the total drainage area tributary to retrofit site (in acre)
- C<sub>in</sub> and C<sub>eff</sub> are the expected influent and effluent concentrations of E. Coli at the retrofit BMP site (in cfu per 100mL).



The stepwise approach was applied to all retrofit sites identified within the MSAR watershed.

### **3.1.4 Results**

The majority of retrofit sites are located more than 3,000 feet away from the identified five monitoring compliance locations. Infiltration-based structural BMPs have the benefit of reducing dry-weather runoff, thus limiting the potential for regrowth of bacterial indicator. Potential constraints may limit the feasibility of infiltration facilities in the MSAR watershed, including the reduction of dry-weather flow that could conflict with Basin Plan and beneficial uses objectives. Results specific to each retrofit site are provided in Appendix B.

## **3.2 Middle Santa Ana River Bacterial Indicator TMDL for wet-weather conditions**

The Permit also explicitly identifies that water quality-based effluent limits, along with TMDL implementation requirements, will be formulated for the Middle Santa Ana River Bacterial Indicator TMDL for wet-weather conditions before the approval of the next term MS4 Permit.

As stated in Permit Provision V.D.4., *"In the event this Order is still in effect on December 31, 2025, and the Regional Board has not adopted alternative final water quality-based effluent limits for wet-weather conditions by that date, then the urban wasteload allocations specified in the MSAR-TMDL for wet weather conditions (November 1<sup>st</sup> through March 31<sup>st</sup>) will automatically become the final numeric water quality-based effluent limits for the MSAR Permittees on January 1, 2026."*

Section 4 of the dry-weather CBRP states that a CBRP specific to wet-weather conditions will be completed within 24 months following the adoption of the next MS4 Permit.

### **3.2.1 Criteria and Thresholds**

The results of this retrofit study provide guidance to Program, both for WAP implementation and for the future development of the wet-weather CBRP. Permittees may be able to quantify the contribution of retrofit BMPs towards the achievement of future wasteload allocations for urban dischargers by year 2026. The investigation performed for the purpose of the retrofit study focused on identifying load removal and effluent concentration of fecal coliform expected by the implementation of each individual retrofit site. The investigation quantifies these reductions, if any is expected.

### **3.2.2 Data Sources**

A number of key data pertaining to the MSAR watershed was gathered in order to quantify the drainage area being mitigated, as well as the expected pollutant concentrations and loadings. The analysis builds upon the findings and data collected during the Phase I Retrofit Study. These include:

- USGS topography, or 30-foot contours, was used to delineate the drainage area tributary to the retrofit site.
- Land use distribution was computed in each sub-watershed based on the 2008 SCAG Land Use GIS layer.
- The Los Angeles County Department of Public Works published typical runoff concentrations per land use type based on monitoring performed in Los Angeles County



and Ventura County (LACDPW, 2008). Typical land use-based fecal coliform concentrations may be identified in Appendix B.

- Continuous hourly rainfall data from 1929 through 2008 at the Redlands meteorological station helped quantify the number of rainfall events per year (25 events), the number of annual water quality events (below 85<sup>th</sup> percentile, i.e. 20 events), and the average rainfall depth of water quality events (0.24 inches).
- Typical BMP removal performance and expected effluent concentrations that derive from the December 2012 International BMP Database.

Data was compiled during the desktop analysis with the assistance of the Program.

### **3.2.3 Methodology for Fecal Coliform**

For each individual retrofit site, a stepwise analysis was performed to quantify an expected reduction, if any, in concentration and load of fecal coliform caused by the implementation of a structural BMP. The different steps of the analysis are described below:

- Step 1 – The expected concentration of fecal coliform in the tributary drainage system adjacent to the evaluated site is computed based on the land use distribution of the tributary drainage area, as well as typical stormwater runoff concentrations of fecal coliform per land use. The following equation is applied to calculate the pro-rated influent concentration:

$$C_{in,fc} = \sum_i C_{i,fc} \times \frac{DA_i}{TDA_{retrofit}}$$

Where:

- $C_{in,fc}$  is the expected area-weighted fecal coliform influent concentration at retrofit site (MPN per 100mL)
- $C_{i,fc}$  is the fecal coliform concentration from land use type  $i$  (MPN per 100mL)
- $DA_i$  is the drainage area of land use type  $i$  (acre)
- $TDA_{retrofit}$  is the total drainage area tributary to the retrofit site (acre)
- Step 2 - The expected influent concentration for fecal coliform in the tributary drainage system is compared to the expected effluent concentration based on the statistical findings of the 2012 International BMP Database for the selected structural treatment BMP. Table 3 summarizes fecal coliform influent and effluent statistics associated with each BMP.



**Table 3 - Fecal Coliform Influent and Effluent Summary Statistics for Structural BMPs (2012 International BMP Database)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 91700)	23200 (300,39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 18300)	11200 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 21000)	6140 (230, 11800)	25100	20600

- Step 3 – Based on the land use distribution and imperviousness in the drainage area tributary to the retrofit site, a runoff coefficient is computed using the regression equation identified in the March 2013 San Bernardino County Technical Guidance Document.

$$C = 0.858 \times i^3 - 0.78 \times i^2 + 0.774 \times i + 0.04$$

- Step 4 – Based on the findings of the comparison between expected influent and effluent fecal coliform concentrations to and from the retrofit site, an annual load reduction for fecal coliform is computed. The estimate accounts for the treatment capacity of the system, for the number of annual storm events and water quality events, and for the average rainfall depth of water quality events. The percentage of wet-weather runoff being treated corresponds to treatment capacity of a structural BMP over the expected stormwater runoff volume. The annual load reduction of E.Coli, if any, is quantified per the following equation:

$$Load\ Reduction_{fc,retrofit} = \left( \frac{\#WQSE}{(\#SE - \#WQSE)} \right) \times \left( \frac{\%WQ_{captured}}{\%WQ_{max_{captured}}} \right) \times \left( \frac{d_{ave,WQ}}{d_{85th}} \right) \times C \times TDA_{retrofit} \times (C_{in} - C_{eff})_{fc}$$

Where:

- Load Reduction<sub>fc, retrofit</sub> is the estimated annual load reduction of fecal coliform (MPN);
- (# WQSE) and (#SE) are the numbers of water quality storm events and storm events per year, respectively;
- (%WQ<sub>captured</sub> and %WQ<sub>max<sub>captured</sub></sub>) are expressed in percentage and correspond to the runoff volume being captured under the average water quality event and 85<sup>th</sup> percentile event conditions, respectively;
- d<sub>ave, WQ</sub> and d<sub>85th</sub> are expressed in inches and correspond to the rainfall depth of the average water quality event and the 85<sup>th</sup> percentile event, respectively;



- C is the runoff coefficient, as computed in Step 3;
- $TDA_{\text{retrofit}}$  is the total drainage area tributary to the retrofit site (in acre);
- $C_{\text{in}}$  and  $C_{\text{eff}}$  are the expected influent and effluent concentrations of fecal coliform at the retrofit BMP site (MPN per 100mL).

The stepwise approach was applied to all retrofit sites identified within the MSAR watershed.

### **3.2.4 Results**

The quantification of load removals and resulting effluent concentrations that may derive from the implementation of retrofit BMPs is an essential element to consider for the strategy of the wet-weather CBRP. The majority of the retrofit sites is infiltration-based and provides reductions of both runoff and fecal coliform loading in the receiving stream. Other BMPs, besides the wet pond, may not provide any benefits other than treating wet-weather runoff from other pollutants of concern. Results specific to each retrofit site are provided in Appendix B.

## **3.3 Big Bear Nutrient TMDL for dry hydrological conditions**

Resolution No. R8-2006-0023 amended the water quality control plan to incorporate a Nutrient TMDL for Dry Hydrological Conditions for Big Bear Lake. Section V.D.3. of the Permit identifies that *“the City of Big Bear Lake, the County of San Bernardino and San Bernardino County Flood Control District shall implement BMPs designed to assure continued compliance with the following urban wasteload allocation for phosphorus during dry hydrological conditions.”*

### **3.3.1 Criteria and Thresholds**

The joint annual wasteload allocation established by the Nutrient TMDL for urban stormwater dischargers is limited to 475 lbs of total phosphorus during dry hydrological conditions, and corresponds to the baseline conditions (1999-2002). The annual wasteload allocation was established based on the results of a Big Bear LSPC watershed model that accounts for hydrologic, sediment, and pollutant-transport characteristics in the Big Bear Lake watershed. The final demonstration of compliance with the wasteload allocation is required by December 31, 2015.

The Big Bear Lake TMDL stakeholders developed a TMDL Action Plan identifying a set of actions, aimed at achieving the goals of the Nutrient TMDL within the mandatory timeframe. The recommendations set forth by the Action Plan are supported by technical studies performed in the Big Bear Lake watershed, which identified the release of nutrient from lake-bottom sediments during dry hydrologic conditions as the most significant source of nutrient impairments. The Action Plan focuses on in-lake management solutions, such as aeration techniques, sediment dredging, lake treatment chemicals, and monitoring actions. Other formulated recommendations include programmatic solutions, such as ordinances regulating dust control from construction sites, pet waste, phosphorus-free fertilizers, public education, and the implementation of LID and WQMP requirements for new and re-development. In addition, the stakeholders have identified the potential benefit of implementing structural BMPs such as detention basins and other BMPs that would contribute to the mitigation of sediment and nutrients.



The investigations of this retrofit study have focused on the benefits of implementing retrofit BMPs in the Big Bear Lake Area to reduce the loads of total phosphorus from urban areas. Only one potential retrofit site was identified during the Phase I analysis.

As stated in the Nutrient TMDL Action Plan, and identified by the Big Bear Lake watershed model, the United States Forest Service land is the major contributor of sediment to the Lake, and should constitute the primary location for implementation of detention basins, if feasible. Available land is, however, outside of the jurisdiction of the Program.

### **3.3.2 Data Sources**

A number of key data pertaining to the Big Bear Lake watershed was gathered in order to quantify the urban drainage area being mitigated, as well as the expected pollutant concentrations and loadings. The analysis builds upon the findings and data collected during the Phase I Retrofit Study. Data specifically collected for this task include:

- USGS topography, or 30-foot contours, was used to delineate the drainage area tributary to the retrofit site.
- The analysis is based on observed concentrations of total phosphorus and watershed information. Typical concentrations of total phosphorus observed in the different tributaries to Big Bear Lake (Boulder Creek, Grout Creek, Knickerbocker Creek, Rathbun Creek, and Summit Creek) were derived from monitoring data collected in year 2011 and published on the Regional Board website.
- Other information such as land use and expected runoff volumes were derived from the 2006 Big Bear Watershed Model developed by Tetra Tech.
- Typical BMP removal performance and expected effluent concentrations derive from the December 2012 International BMP Database.

Data was compiled during the desktop analysis with the assistance of the Program.

### **3.3.3 Methodology**

The technical approach taken for this investigation is two-fold. The first step consists of computing the annual load of total phosphorus expected for the tributary drainage system that is adjacent to the identified retrofit site. The second step consists of comparing the expected influent concentration in the tributary drainage system to the removal performance of the selected structural treatment BMP. The later step may ultimately translate into a load reduction, if any.

For each individual retrofit site, the existing load of total phosphorus was computed, as follows:

$$Loading(TP)_{retrofit} = WLA(TP)_{urban} \times \frac{TDA_{retrofit}}{DA_{urban}}$$

Where:

- $Loading(TP)_{retrofit}$  is the annual pollutant load for total phosphorus expected for the tributary drainage adjacent to the retrofit site (lbs/year)
- $WLA(TP)_{urban}$  is the wasteload allocation of total phosphorus established for urban dischargers (475 lbs/year)



- $TDA_{\text{retrofit}}$  is the total drainage area tributary to the retrofit site (acre)
- $DA_{\text{urban}}$  is the total urban land as identified in the 2005 Staff Report and 2006 Big Bear LSPC watershed model (5,155 acres).

Stakeholders of the Big Bear Lake Nutrient TMDL collected monitoring data in 2011 to determine the levels of total phosphorus water column concentrations observed in the different tributaries to Big Bear Lake. The results of these monitoring investigations are summarized in Table 4.

**Table 4 - Results of 2011 stormwater monitoring efforts in Big Bear Area**

Location		Boulder Creek	Grout Creek	Knickerbocker Creek	Rathbun Creek	Rathbun Creek Below Zoo	Summit Creek
Total Phosphorus as P (mg/L)	Sample Count	2	6	9	9	9	7
	Mean	0.016	0.025	0.103	0.053	0.058	0.078
	Median	0.016	0.024	0.072	0.041	0.038	0.08
	Range of Values	0.014 - 0.017	0.019 - 0.037	0.023 - 0.32	0.02 - 0.118	0.03 - 0.135	0.05 - 0.111
	Standard Deviation	0.002	0.007	0.093	0.031	0.037	0.021

The results highlight that the highest mean and median for total phosphorus were observed in Summit Creek, being 0.078 mg/L and 0.08 mg/L, respectively. Typical BMP removal performance and expected effluent concentrations, as listed in

Table 5, derive from the December 2012 International BMP Database. A comparison of the removal performance of these BMPs to the observed concentrations for total phosphorus in tributary streams to Big Bear Lake demonstrate that only infiltration-based structural BMPs may help reduce loadings of total phosphorus.

**Table 5 - Typical BMP Effluent Summary Statistics (2012 International BMP Database)**

BMP Type	Total Nitrogen (mg/L)
Infiltration Basin	0.00
Wet Basin	1.28
Constructed Wetland	1.19
Extended Detention Basin	2.37
Media Filter	0.82
Biofiltration with underdrains	0.90
Bioretention	0.00

### **3.3.4 Results**

Only infiltration-based structural BMPs may help reduce loadings of total phosphorus to meet the established wasteload allocation for urban dischargers. The opportunities to infiltrate are limited in the Big Bear area due to the existing severe topology and the typical requirement for infiltration facilities to exhibit a minimum depth to groundwater of 10 feet. Other structural BMPs may help alleviate the load of sediment being discharged to Big Bear Lake, thus indirectly



reducing the release of nutrients during dry hydrologic conditions. The relationship between the reduction of sediment loadings and the release rate of nutrients from bottom sediments must, however, be demonstrated by the existing lake model that simulates the in-lake processes.

Results specific to each retrofit site are provided in Appendix B.



## 4 Hydromodification Management Specific Retrofit Study

Following the development of the Hydromodification Management Plan, this study identifies the ability of each individual retrofit site to assist with reducing the effects of hydromodification in the permitted area of the watershed. The study evaluates the BMP's capacity to infiltrate onsite, identifies the existing imperviousness of the drainage area tributary to the retrofit site, and quantifies the additional imperviousness in the drainage area that the retrofit BMP may offset while still meeting the requirements of the hydromodification mitigation. This planning-level study is solely based on volumetric mitigation.

### 4.1 Criteria and Thresholds

Section XI.E.5.d of the Permit specifies the conditions that would result in a project having the potential to cause a Hydrologic Condition of Concern (HCOC) must be mitigated. If the site is listed as having a potential to cause an HCOC, criteria has been established to evaluate the site's effectiveness in mitigation of the HCOC impacts. Comparison of the site's pre- and post-development hydrology is the key component in assessing a site's effectiveness in addressing HCOCs. From Section XI.E.5d of the Permit: *"Post-development runoff volume, time of concentration, and peak flow velocity for the two-year frequency storm does not exceed that of the predevelopment condition by more than five percent."*

These requirements are embedded in the March 2013 *Draft Technical Guidance Document for Water Quality Management Plans (WQMP)* that was submitted by the Program to the RWQCB. The site's drainage characteristics will be determined through hydrological analysis for a 24-hour design storm event on a 2-yr return period.

The identified retrofit sites have been analyzed for effectiveness in addressing HCOC mitigation for post-development runoff volume criteria only. Time of concentration and peak flow investigations have been ruled out of this retrofit investigation as not appropriate for planning-level evaluations. Development typically engenders an increase in imperviousness, thus reducing the time of concentration. An increase in impervious area directly affects the overland flow and reduces the impact of moisture condition from pervious areas. However, the duration of flow can still be controlled for the site. Mitigation of peak flow is also not considered at this stage of the study but may be controlled through the proper design of an outlet structure. Mitigation for peak flow and duration should be addressed at the design stage of a retrofit site, notably by appropriate sizing of the outlet structure.

The analysis quantifies the amount of impervious area that may be offset within the drainage area tributary to the BMP retrofit site. The approach taken ensures that the post-development runoff volume, which may be mitigated by the retrofit BMP, does not exceed the pre-development runoff volume by more than 5 percent, thus addressing the volumetric component of HCOC requirements.

### 4.2 Data Sources

A number of key data pertaining to each retrofit site was gathered in order to quantify the impervious drainage area being mitigated by the implementation of the retrofit BMP. The analysis builds upon the findings and data collected during the Phase I Retrofit Study. Additional information specifically collected to perform the specific hydromodification analysis includes:



- Percentage breakdown of drainage area by hydrologic soil group (A, B, C, D) per the San Bernardino County Hydrology Manual and the NRCS soil database.
- Percentage breakdown of drainage area by land use per the San Bernardino County Hydrology Manual and the 2008 SCAG Land Use Layer.
- The design rainfall depth (2-year return period, 24-hour rainfall depth) extracted using the NOAA Atlas 14 Precipitation Frequency Data Server ( $P_{2yr,24hr}$ ). ([http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca\\_pfds.html](http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html))

Data was compiled during the desktop analysis with the assistance of the Program.

### 4.3 Methodology

Estimation of runoff volume from a design storm event is performed per the San Bernardino County Hydrology Manual. The method for calculations uses an empirical factor, the runoff curve number ( $CN$ ), for estimating the percentage of rainfall depth that is converted to runoff. The higher the  $CN$ , the higher the portion of rainfall is anticipated to become runoff, as is the applicable to impervious surfaces, where an assumption that the  $CN$  is 98 is made. In contrast, the lower the  $CN$ , the lower the portion of rainfall is anticipated to become runoff, as is the case with natural land type covers where rainfall is likely to infiltrate to groundwater.

The first step in calculating the runoff volume for the site consists of dividing the drainage management areas ( $DMA$ ) based on hydrologic soil group and land use type. Based on the land use and soil type, determine the pervious  $CN$  using Figure C-3 of the San Bernardino County Hydrology Manual. For conservative results, determination of pervious  $CN$  values is derived from the values under cover type “Urban Covers: Residential or Commercial Landscaping,” and quality of cover “Good.” If numerous soil groups and land types exist in the drainage area, a weighted average must be used for the entire drainage area using the following equation:

$$CN_{pre} = \frac{\sum_n CN_n \times DMA_n}{DMA}$$

Once the pervious  $CN$  has been computed, Figure C-4 of the Hydrology Manual is used to compute the percentage of impervious area associated with the drainage area by utilizing the land use. For conservative calculations, use values under the “Recommended Value For Average Conditions-Percent.” For drainage areas with multiple land uses, a weighted average is necessary to calculate the percent imperviousness:

$$\%_{Imp} = \frac{\sum_n \%_{Imp,n} \times DA_n}{DA}$$

Per SB Hydrology Manual Figure C-4: (High Density = 80%, Med/Low Density = 40%, Transportation = 90%).

Once the percent imperviousness has been calculated for each site, the post-development  $CN$  is to be calculated using the following equation:



$$CN_{post} = (0.98 \times \%Imp) + CN_{pre}(1 - \%Imp)$$

The  $CN_{post}$  value represents the actual curve number for the site's drainage area, taking into consideration both pervious and impervious surfaces.

The weighted pervious  $CN$  is then converted into a soil storage capacity ( $S$ ) and initial abstraction ( $I_a$ ) using the following equations;

$$S = \frac{1000}{CN_{DMA}} - 10$$

$$I_a = 0.2 \times S$$

The initial abstraction is the depth of rainfall that is not available for surface runoff, by way of hydrologic processes such as infiltration, interception, or depression storage. In order to convert this estimate of initial abstraction to a runoff volume it is necessary to determine the design rainfall depth. The 2-year return period, 24-hour rainfall depth ( $P_{2yr,24hr}$ ) for the project site is extracted using the NOAA Precipitation Frequency Data Server. This query tool uses site coordinates to interpolate point rainfall for the center of a project site from isohyet maps ([http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca\\_pfds.html](http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html)).

Runoff volume ( $V_{pre}$ ) from the site is then computed for pre-developed conditions using the following equation:

$$V_{pre} = \frac{1}{12} \times DA \times \frac{(P_{2yr,24hr} - I_a)^2}{(P_{2yr,24hr} - I_a + S)}$$

Thus, per compliance with the Permit's requirement for addressing HCOC's, the post-condition runoff volume ( $V_{post}$ ) at the downstream compliance point of the drainage area is calculated by the following equation:

$$V_{post} = 1.05 \times V_{pre}$$

However, if infiltration is deemed feasible at the site, the above equation becomes:

$$V_{post} = 1.05 \times V_{pre} + V_{inf}$$

where  $V_{inf}$  is the volume of water that is infiltrated thru the basin, which is equivalent to the volumetric capacity of the basin. If infiltration is deemed as infeasible at the site, then the  $V_{inf}$  term is negligible.



Thus, in order to quantify the amount of surface area that the BMP is able to offset to comply with HCOC requirements in the Permit, a new CN must be calculated to satisfy the runoff volume  $V_{post}$ , which is then be used to back calculate the new impervious percentage of the drainage area.

$$V_{post} = \frac{1}{12} \times DA \times \frac{(P_{2yr,24hr} - I_a)^2}{(P_{2yr,24hr} - I_a + S)}; \text{ using a } CN_{new} \text{ to satisfy } I_a \text{ and } S$$

$$CN_{new} = (0.98 \times \%Imp) + CN_{pre}(1 - \%Imp)$$

Once a new impervious percentage has been calculated, the drainage area value can be determined by multiplying the new impervious percentage by the original site drainage area. The surface area offset from hydromodification is defined as the difference between the original site's drainage area and the new drainage area due to hydromodification.

$$Surface\ Area_{offset} = (\%Imp_{new} - \%Imp_{old}) \times DA$$

#### 4.4 Result Matrix

The hydromodification offset evaluation was performed for each retrofit site, identified as potentially feasible upon review from the Program and listed in Section 2.2. The results of the investigation specific to hydromodification management are summarized in Table 6. Table 6 identifies if the potential retrofit BMP may consider infiltration as a component, the existing imperviousness, and the additional impervious area that the retrofit site could offset from a volumetric standpoint.



Table 6 - Hydromodification Management Offset Opportunities

BMP ID	SBC Tributary Area (ac)	BMP Footprint (ac)	Soil Type	% Imp	% Imp Increase	Surface Area Offset (ac)
011001310	12.5	0.10	A	78.1%	4.49%	0.6
011031112	33258.7	4.33	A	37.0%	1.46%	486.4
011347203	9234.8	42.72	A	71.9%	2.95%	272.8
012802134	3744.6	2.55	A	54.4%	2.30%	86.1
014125103	46601.2	4.51	A	16.8%	0.76%	353.1
014218106	705.3	2.65	A	68.6%	2.99%	21.0
014218110	969.8	2.49	A	68.2%	2.48%	24.0
015328131	11285.8	1.35	A	6.9%	1.74%	196.4
016338113	3974.1	3.33	A	29.6%	27.71%	2,422.1
020118315	1477.2	30.83	A	52.5%	8.91%	131.7
020199114	1058.4	13.35	A	50.6%	6.50%	68.8
021018145	11844.5	18.50	A	43.2%	2.19%	258.8
021813101	47319.3	67.68	A	46.4%	2.15%	1,015.2
021830106	57223.8	4.93	C	46.3%	1.14%	653.1
022707113	988.6	24.26	A	53.1%	9.56%	94.5
022928370	341.7	8.53	A	64.3%	11.24%	38.4
022929109	3212.9	14.78	A	57.0%	3.27%	105.1
023010202	2930.1	8.81	A	59.6%	2.46%	72.1
023803129	28130.6	1.92	A	34.5%	0.78%	219.3
023809104	329.9	62.04	A	73.4%	29.61%	97.7
023812103	14204.6	62.84	A	44.9%	4.28%	609.4
024907103	3908.7	2.53	A	66.6%	1.54%	60.1
025408111	1280.1	4.74	A	65.3%	2.92%	37.4
026006118	90.6	1.92	A	41.4%	18.48%	16.7
026203115	390.9	13.73	A	36.3%	17.12%	66.9
026421317	3395.9	3.99	A	53.6%	1.74%	58.9
026528108	3421.8	10.68	A	32.8%	3.65%	124.9
026607209	768.0	3.62	A	74.6%	3.22%	24.7

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BMP ID	SBC Tributary Area (ac)	BMP Footprint (ac)	Soil Type	% Imp	% Imp Increase	Surface Area Offset (ac)
027214142	2914.0	2.41	B	21.1%	2.23%	65.1
027932160	31199.9	8.49	B	30.2%	1.17%	365.5
028574212	3065.6	2.63	A	11.8%	2.66%	81.5
030113274	990.9	1.64	B	22.9%	2.13%	21.1
030312104	3287.6	10.67	A	26.2%	4.01%	131.7
030905101	189.3	2.17	B	59.4%	0.00%	0.0
101326117	20700.3	0.39	A	28.4%	17.08%	5,495.1
102337170	17.0	0.40	C	79.9%	0.00%	0.0
103226113	1193.7	0.54	B	33.8%	3.21%	38.3
103260142	738.5	0.40	B	37.6%	3.67%	27.1
103309117	137.1	1.92	B	67.2%	5.67%	7.8
104712102	4212.5	30.47	A	69.9%	3.86%	162.7
104745104	4428.6	1.90	A	69.6%	1.64%	72.6
105029126	324.8	0.50	A	72.8%	1.87%	6.1
105216106	1063.4	17.54	A	68.8%	7.35%	78.1
108902101	5469.3	72.16	A	7.9%	10.85%	593.2
7th Street Park	1115.9	1.92	B	54.6%	2.63%	29.3
Almeria_F	131.8	0.27	A	77.7%	2.32%	3.1
Anne Shirrells Park	1259.9	3.87	A	53.6%	3.11%	39.1
Aquatic_F	45.5	0.59	A	60.5%	5.24%	2.4
Bryn Mawr Veterans Memorial Park	374.5	0.29	B	59.7%	1.87%	7.0
Catawba_F	2725.5	9.31	A	60.7%	2.72%	74.2
Centennial_O	66.8	0.97	C	55.2%	0.97%	0.6
Elmer Digno Park	741.3	1.23	B	45.8%	2.36%	17.5
George E. Brown Jr. Park	207.3	3.94	A	53.7%	11.17%	23.1
Hunters_F	151.6	0.19	A	60.1%	2.28%	3.5
Koehler_F	61.6	0.89	A	72.7%	5.42%	3.3
Littlefield-Shultis Memorial Park	99.2	6.71	A	61.7%	21.17%	21.0
McDermott_F	1994.2	1.90	A	56.1%	1.68%	33.6
Meadowbrook Park	889.4	4.98	A	63.7%	4.82%	42.9

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<b>BMP ID</b>	<b>SBC Tributary Area (ac)</b>	<b>BMP Footprint (ac)</b>	<b>Soil Type</b>	<b>% Imp</b>	<b>% Imp Increase</b>	<b>Surface Area Offset (ac)</b>
Nunez Park	877.8	2.67	A	69.9%	3.20%	28.1
Oak_F	158.5	1.08	A	74.6%	4.49%	7.2
Perris Hill Park	148.2	1.97	B	50.0%	5.94%	8.8
Ranch_O	12.2	0.21	C	78.5%	2.32%	0.3
SanSevaine_F	38.6	0.19	A	74.4%	3.21%	1.2
Southridge_F	18.7	0.95	A	72.2%	17.11%	3.2
Speicher Park	4373.5	1.61	A	23.0%	1.92%	83.9
Strickling_CH	100.6	0.76	B	67.7%	4.98%	5.0
SummitHeights_F	40.3	0.84	B	79.3%	4.36%	1.8
Sycamore_F	132.8	0.72	A	76.4%	3.09%	4.1
Verdemont Park	5459.9	2.54	A	3.2%	1.94%	105.8
Yucaipa Valley Golf Club	11955.8	4.72	B	22.9%	1.79%	213.5
Yucaipa Equestrian Center	4900.6	5.60	B	20.7%	4.99%	266.8



## 5 LID Offset Specific Retrofit Study

Section XI.E.10 of the Permit identifies that if conditions exist at a development site where infiltration, harvesting and use, and/or evapotranspiration, and or biotreatment is not feasible, LID can be implemented on either a sub-regional or regional basis. A study has been developed to assess the feasibility of each identified retrofit sites to serve as an offset project for LID implementation. The study incorporates forecasting development for each sub-watershed in the permitted area and the development of regional and sub-regional LID project scenarios for each sub-watershed consistent with the forecast of development. These LID project implementation scenarios are prioritized based on water quality benefit and feasibility of constructing the LID BMPs.

### 5.1 Criteria and Thresholds

Section XI.D.6 of the Permit identifies that the combined runoff capture from a Priority Development Project's proposed BMPs must equal or exceed volume-based BMP performance criteria. Volume-based performance criteria are used as the measure of the overall effectiveness of the LID BMPs. The Permit requires that volume-based BMPs be evaluated first. Flow-based BMPs may only be used after onsite retention is demonstrated to be infeasible. If flow-based BMPs are used, then they must be sized to provide sufficient capacity for effective treatment of the remainder of the volume-based performance criteria that cannot be achieved with retention BMPs (see Section 5.3.4.3).

Section XI.D.6.a of the Permit includes four alternatives for computing the design capture volume for development of sizing for proposed LID features and other BMPs, if necessary. Of the four, the San Bernardino County program has selected the following criterion for use: *"The volume of annual runoff produced from a 24-hour, 85th percentile storm event determined as the maximum capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998)."*

This alternative employs two regression equations to convert watershed imperviousness to a runoff coefficient and convert average rainfall event depth (based on a 6-hour inter-event time to identify distinct storm events) to a maximized water quality capture volume (WEF/ASCE, 1998). The maximized water quality capture volume is referred to as the DCV and this term will be used for all San Bernardino County WQMPs.

These requirements are embedded in the March 2013 *Draft Technical Guidance Document for Water Quality Management Plans (TGD)*, submitted by the Program to the RWQCB.

This effort quantifies the amount of impervious area that may be offset per the LID requirements because of opportunities to infiltrate at the retrofit site for future development or re-development projects seeking offsite mitigation within the drainage area tributary to the retrofit site. Retrofit sites that do not present any opportunities to infiltrate were not considered appropriate for LID Offset. This investigation identifies also the feasibility to harvest and reuse collected runoff based on the footprint of the retrofit site and the potential proximity to a park or other landscaped public amenity.



## 5.2 Data Sources

A number of key data pertaining to each site must be gathered in order to analyze each BMP for LID offset program retrofit. In addition to the data gathered during Phase I evaluation, each site must also obtain the following data to perform LID offset analysis:

- Site imperviousness ( $i$ )
- 2-year, 1-hour rainfall depth for the site from the NOAA Atlas 14 isohyet map from [http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca\\_pfds.html](http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html) ( $P_{2yr,1hr}$ )

Data was compiled during the desktop analysis with the assistance of the Program.

## 5.3 Methodology

Two separate methodologies were applied to evaluate:

- The amount of impervious area that may be offset through infiltration;
- The feasibility of using the retrofit site as a harvest-and-reuse site.

### Infiltration

Per the March 2013 TGD for WQMP, an infiltration basin is constructed in naturally pervious soils with a flat, earthen bottom. Once inside the infiltration basin, runoff percolates into the underlying soils within 48 hours. The bottom is typically vegetated with dryland grasses or irrigated turf grass. Different types of vegetation are allowed if they can survive periodic inundation and long inter-event dry periods.

The retention volume provided by an infiltration basin is a function of the infiltrating surface area on the basin bottom and the depth of water that is percolated and stored in the basin over the course of the storm and infiltrated within 48 hours after the basin is filled.

The TGD for WQMP identifies that a DCV must be computed for the design of volume-based BMPs. As stated above, the imperviousness of each site must be known. For the calculations in this document, and impervious percentage ( $i$ ) of 100% was utilized to be the most conservative when determining the size of the BMPs due to the assuming the highest amount of water quality volume capture.

From Phase 1 evaluation, the drainage area of the site has been computed. The next step in calculating the DCV is calculating the site's runoff coefficient ( $C$ ) using the following equation:

$$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$$

Next, the  $P_6$  mean storm rainfall depth (in) is calculated for the site by multiplying the 2 year, 1-hr rainfall depth ( $P_{2yr,1hr}$ ) by the appropriate coefficient ( $a_1$ ) for the San Bernardino County climatic region (Valley = 1.4807, Mountain = 1.909, or Desert = 1.2371):

$$P_6 = P_{2yr,1hr} \times a_1$$



To calculate the design capture volume (DCV) in cubic feet ( $V_0$ ) as function of the drainage area (DA) in square feet, the computation accounts for the runoff coefficient ( $C$ ),  $P_6$  the rainfall depth in inches, and a regression constant that corresponds to a specific drawdown time ( $a_2$ : 1.582 for 24-hr drawdown or 1.963 for 48-hr drawdown). Drawdown time is the maximum amount of time that runoff can be stored in a BMP to ensure sufficient capacity to treat subsequent storm events. The following equation computes the DCV:

$$V_0 = a_2 \times DA \times C \times \frac{P_6}{12}$$

Thus for infiltration BMPs, in order to calculate the maximum offset impervious drainage area ( $DA_{max-off}$ ), the capture volume (CV) must be calculated. Three types of infiltration-based BMPs are considered for these investigations, including infiltration basins or chambers, extended detention basins functioning as recharge basins, and bioretention systems. The capture volume is calculated, as follows:

- For infiltration basins and extended detention basins functioning as recharge basins, the calculation accounts for the effective depth of infiltration, which corresponds to the depth of water being infiltrated over a period of 48 hours. Based on standard NRCS values, the effective depth was computed based on infiltration rates of 0.30 inch per hour and 0.15 inch per hour for soils of hydrological group A and B, respectively. The effective depth becomes 1.2 feet and 0.6 feet, respectively. The equation being applied :

$$CV = Footprint_{BMP} \times Effective\ Depth_{48-hr}$$

- For bioretention system, the capture volume is based on the footprint designated in Phase 1, 4-foot BMP depth, and a porosity of 0.35:

$$CV = Footprint_{BMP} \times Porosity \times 4'$$

The maximum offset impervious drainage area is computed, as follows:

$$DA_{max-off} = \frac{CV \times 12}{(a_2 \times C \times P_6)}$$

## Harvest and Use

Per the TGD for WQMP, harvest and use BMPs are LID BMPs that capture and store stormwater runoff for later on-site use. They are designed to store a specified volume of water and have no design surface discharge until this volume is exceeded. Uses of captured water may potentially include irrigation demand, indoor non-potable demand, industrial process water demand, or other demands. The TGD for WQMP provides guidance for irrigation use or only. Harvest and use BMPs involve either above ground (cisterns) or below ground storage of harvested water for subsequent on-site use. In the case of Harvest and Reuse BMPs, feasibility is dependent on the area available for irrigation, the proximity of surrounding facilities, and the area of those respective facilities.

For Harvest and Reuse BMPs, a BMP depth of 5 feet and porosity of 0.90 that is selected to account for the structure of the storage system is assumed. First, the capture volume (CV) associated with the water quality event (48 hour) is calculated:

$$DCV = Footprint_{BMP} \times Porosity \times 5'$$



Per the TGD for WQMP, if the entire project site landscaped area wet season demand over a 48-hour period is less than 50 percent of the *DCV*, then harvest and reuse is deemed as infeasible. Thus, this translates into a calculated Harvest Demand (*HD*) that is expressed in square feet per day:

$$HD = \frac{DCV}{2}$$

Volume retention from the implementation of harvest and use BMPs is a function of the wet season irrigation demand for landscaped areas on the project site. The Inland Empire Landscape Alliance Model Water Ordinance includes a formula for estimating a project's annual Estimated Applied Water Use (*EAWU*) based on the landscaped area in square feet (*LA*), daily reference evaporation (*ET<sub>0wet-day</sub>*), landscape coefficient (*K<sub>L</sub>*), and irrigation efficiency (*IE*), as follows:

$$EAWU_{wet-day} = \left[ LA * \frac{ET_{0wet-day}}{12} * K_L \right] / IE$$

Monthly reference *ET* data was averaged to obtain a daily *ET<sub>0wet-day</sub>* of approximately 0.1 in/day based on several CIMIS stations in the vicinity of the Permit area. For planning level assessments of harvest and use potential, a landscape coefficient of 0.7 shall be used for active turf areas, and 0.35 for conservation landscaping (Orange County Technical Guidance Document Appendix X.2.5.2). For the Permit area, an assumption of 0.9 shall be used. An irrigation efficiency value of 0.75 is used per the ***General Landscaping Guidelines and Irrigation System Design Criteria for Developers, Landscape Architects, Governmental Agencies and Property Managers*** by Coachella Valley Water District, June 2003.

The harvest demand is input as the *EAWU* variable in order to derive the landscaped area that may be irrigated from the volume of water collected for harvest and use.

Since feasibility is dependent on the area available for irrigation, the proximity of surrounding facilities, and the area of those respective facilities. The surrounding area of the potential BMP for facilities that may be irrigated was screened to identify facilities such as, but not limited to:

- Parks
- Sports Fields
- Golf Courses
- Agricultural Area

A buffer radius of 1,000 feet is used to determine if a facility is within proximity of the BMP. The buffer radius was chosen based on the engineer's best professional judgment as a conservative number, taking into consideration the cost associated with piping, irrigation, grading, etc. Once a facility is determined to be within 1,000 feet of the BMP, a comparison of the facility's area and the area available for irrigation must be made. If the area available for irrigation is greater than that of the facility's area, then harvest and use is deemed feasible for the BMP. If it does not satisfy the inequality, then harvest and use is infeasible as an LID BMP.



## **5.4 Result Matrix**

The LID offset evaluation was performed for each retrofit site, identified as potentially feasible upon review from the Program and listed in Section 2.2. The results of the investigation are classified under two separate tables, Table 7 and Table 8, which summarize offsite mitigation opportunities based on infiltration capabilities and the feasibility to implement harvest and reuse systems, respectively. Table 7 identifies if infiltration is feasible at the site based on the soil hydrologic group, the ratio of the DCV that can be treated at the site, and the amount of impervious area that may be offset per the LID requirements. Table 8 identifies if harvest and reuse is specifically feasible at the retrofit site, the proximity to a local park or identified demand, and quantifies the minimum harvest demand and associated area available for irrigation.



Table 7 - LID Offsite Mitigation by Infiltration

BMP ID	BMP Type	BMP Footprint (ac)	Soil Group	Infiltration?	Capture Volume/DCV Ratio	Potential Impervious Area Offset (ac)
011001310	Bioretention	0.10	A	Yes	8.87%	1.1
011031112	Infiltration Basin	4.33	A	Yes	0.10%	34.9
011347203	Extended Detention Basin with Infiltration	42.72	A	Yes	3.88%	358.3
012802134	Infiltration Basin	2.55	A	Yes	0.54%	20.2
014125103	Infiltration Basin	4.51	A	Yes	0.10%	44.9
014218106	Infiltration Basin	2.65	A	Yes	3.30%	23.3
014218110	Infiltration Basin	2.49	A	Yes	2.32%	22.5
015328131	Infiltration Basin	1.35	A	Yes	0.10%	11.1
016338113	Infiltration Chamber	3.33	A	Yes	0.88%	35.1
020118315	Extended Detention Basin with Infiltration	30.83	A	Yes	15.03%	222.1
020199114	Extended Detention Basin with Infiltration	13.35	A	Yes	9.03%	95.6
021018145	Infiltration Basin	18.50	A	Yes	1.29%	152.8
021813101	Extended Detention Basin with Infiltration	67.68	A	Yes	1.24%	588.4
021830106	Extended Detention Basin	4.93	C	No	-	-
022707113	Extended Detention Basin with Infiltration	24.26	A	Yes	20.31%	200.8
022928370	Infiltration Basin	8.53	A	Yes	23.68%	80.9
022929109	Extended Detention Basin with Infiltration	14.78	A	Yes	4.39%	140.9
023010202	Extended Detention Basin with Infiltration	8.81	A	Yes	2.82%	82.6
023803129	Infiltration Basin	1.92	A	Yes	0.07%	18.6
023809104	Extended Detention Basin with Infiltration	62.04	A	Yes	100.00%	329.9
023812103	Extended Detention Basin with Infiltration	62.84	A	Yes	4.12%	584.9
024907103	Extended Detention Basin with Infiltration	2.53	A	Yes	0.55%	21.6
025408111	Infiltration Basin	4.74	A	Yes	3.49%	44.7
026006118	Infiltration Basin	1.92	A	Yes	21.55%	19.5
026203115	Infiltration Basin	13.73	A	Yes	22.17%	86.7
026421317	Extended Detention Basin with Infiltration	3.99	A	Yes	0.90%	30.5
026528108	Extended Detention Basin with Infiltration	10.68	A	Yes	2.30%	78.6

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BMP ID	BMP Type	BMP Footprint (ac)	Soil Group	Infiltration?	Capture Volume/DCV Ratio	Potential Impervious Area Offset (ac)
026607209	Extended Detention Basin with Infiltration	3.62	A	Yes	3.46%	26.6
027214142	Infiltration Basin	2.41	B	Yes	0.35%	10.3
027932160	Infiltration Basin	8.49	B	Yes	0.13%	40.4
028574212	Extended Detention Basin with Infiltration	2.63	A	Yes	0.75%	23.0
030113274	Infiltration Basin	1.64	B	Yes	0.80%	7.9
030312104	Extended Detention Basin with Infiltration	10.67	A	Yes	2.84%	93.4
030905101	Biofiltration	2.17	B	Yes	9.35%	0.0
101326117	Infiltration Chamber	0.39	A	Yes	0.02%	3.3
102337170	Biofiltration	0.40	C	No	25.78%	4.4
102835124	Infiltration Basin	0.81	B	Yes	0.25%	3.5
103226113	Infiltration Basin	0.54	B	Yes	0.19%	2.3
103260142	Bioretention	0.40	B	Yes	0.60%	4.4
103309117	Infiltration Basin	1.92	B	Yes	6.25%	8.6
104712102	Extended Detention Basin with Infiltration	30.47	A	Yes	5.91%	248.9
104745104	Extended Detention Basin with Infiltration	1.90	A	Yes	0.35%	15.5
105029126	Infiltration Basin	0.50	A	Yes	1.27%	4.1
105216106	Extended Detention Basin with Infiltration	17.54	A	Yes	13.91%	147.9
108902101	Extended Detention Basin with Infiltration	72.16	A	Yes	10.76%	588.4
7th Street Park	Infiltration Basin	1.92	B	Yes	0.79%	8.9
Almeria_F	Infiltration Basin	0.27	A	Yes	1.56%	2.1
Anne Shirrells Park	Infiltration Basin	3.87	A	Yes	2.52%	31.8
Aquatic_F	Infiltration Chamber	0.59	A	Yes	8.85%	4.0
Bryn Mawr Veterans Memorial Park	Infiltration Chamber	0.29	B	Yes	0.41%	1.5
Catawba_F	Infiltration Basin	9.31	A	Yes	3.28%	89.3
Centennial_O	Biofiltration	0.97	C	No	15.84%	10.6
Crossroads_CH	Infiltration Basin	1.68	B	Yes	3.30%	7.1
Elmer Digno Park	Infiltration Basin	1.23	B	Yes	0.87%	6.5
George E. Brown Jr. Park	Infiltration Basin	3.94	A	Yes	17.52%	36.3
Hunters_F	Infiltration Chamber	0.19	A	Yes	0.84%	1.3

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<b>BMP ID</b>	<b>BMP Type</b>	<b>BMP Footprint (ac)</b>	<b>Soil Group</b>	<b>Infiltration?</b>	<b>Capture Volume/DCV Ratio</b>	<b>Potential Impervious Area Offset (ac)</b>
Koehler_F	Infiltration Basin	0.89	A	Yes	10.75%	6.6
Littlefield-Shultis Memorial Park	Infiltration Basin	6.71	A	Yes	44.61%	44.2
McDermott_F	Infiltration Basin	1.90	A	Yes	0.81%	16.2
Meadowbrook Park	Infiltration Basin	4.98	A	Yes	5.26%	46.8
Nunez Park	Infiltration Basin	2.67	A	Yes	2.65%	23.3
Oak_F	Infiltration Basin	1.08	A	Yes	6.61%	10.5
Perris Hill Park	Infiltration Basin	1.97	B	Yes	5.81%	8.6
Ranch_O	Biofiltration	0.21	C	No	19.35%	2.4
SanSevaine_F	Infiltration Chamber	0.19	A	Yes	3.28%	1.3
Southridge_F	Infiltration Basin	0.95	A	Yes	49.47%	9.2
Speicher Park	Infiltration Basin	1.61	A	Yes	0.33%	14.6
Strickling_CH	Infiltration Basin	0.76	B	Yes	3.22%	3.2
SummitHeights_F	Infiltration Basin	0.84	B	Yes	7.55%	3.0
Sycamore_F	Infiltration Basin	0.72	A	Yes	5.16%	6.9
Verdemont Park	Infiltration Basin	2.54	A	Yes	0.28%	15.4
Yucaipa Valley Golf Club	Infiltration Basin	4.72	B	Yes	0.18%	21.6
Yucaipa Equestrian Center	Infiltration Basin	5.60	B	Yes	0.50%	24.6

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**Table 8 - Feasibility of Harvest and Reuse**

BMP ID	BMP Footprint (ac)	Harvest Demand (ac-ft/day)	Area Available for Irrigation (ac)	Facilities within 1000' radius	Facility Name	Harvest & Reuse Feasible?
011001310	0.10	0.24	23.5	Yes	D Street Park	Yes
011031112	4.33	9.74	974.0	No		No
011347203	42.72	96.12	9,615.5	No		No
012802134	2.55	5.74	574.2	No		No
014125103	4.51	10.16	1,016.1	No		No
014218106	2.65	5.96	595.9	No		No
014218110	2.49	5.61	561.5	No		No
015328131	1.35	3.03	303.2	No		No
016338113	3.33	7.48	748.6	No		No
020118315	30.83	69.38	6,940.5	No		No
020199114	13.35	30.04	3,004.8	No		No
021018145	18.50	41.62	4,163.9	Yes	Cucamonga-Guasti Regional Park	Yes
021813101	67.68	152.28	15,234.5	No		No
021830106	4.93	11.08	1,108.7	Yes	Ag Field	Yes
022707113	24.26	54.59	5,461.4	Yes	Etiwanda High School	Yes
022928370	8.53	19.19	1,919.7	No		No
022929109	14.78	33.24	3,325.7	No		No
023010202	8.81	19.82	1,982.8	No		No
023803129	1.92	4.32	431.7	No		No
023809104	62.04	139.58	13,963.7	No		No
023812103	62.84	141.38	14,143.8	No		No
024907103	2.53	5.70	570.5	No		No
025408111	4.74	10.67	1,067.8	Yes	Hermosa Cemetery	Yes
026006118	1.92	4.31	431.6	Yes	Agua Mansa Cemetery	Yes
026203115	13.73	30.89	3,090.6	No		No
026421317	3.99	8.98	898.8	Yes	Jerry Eaves Park	Yes
026528108	10.68	24.02	2,403.0	No		No
026607209	3.62	8.14	814.8	No		No

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BMP ID	BMP Footprint (ac)	Harvest Demand (ac-ft/day)	Area Available for Irrigation (ac)	Facilities within 1000' radius	Facility Name	Harvest & Reuse Feasible?
027214142	2.41	5.43	543.0	No		No
027932160	8.49	19.09	1,910.1	No		No
028574212	2.63	5.93	593.1	No		No
030113274	1.64	3.68	368.4	No		No
030312104	10.67	24.01	2,401.8	No		No
030905101	2.17	4.89	489.1	Yes	Meadow Park	Yes
101326117	0.39	0.88	87.9	No		No
102337170	0.40	0.90	90.4	Yes	Skyview Park	Yes
102835124	0.81	1.82	181.6	Yes	Ag Field	Yes
103226113	0.54	1.21	120.6	No		No
103260142	0.40	0.91	90.7	Yes	Crossroads Parks	Yes
103309117	1.92	4.32	431.9	Yes	Meadows Park	Yes
104712102	30.47	68.56	6,859.0	No		No
104745104	1.90	4.28	427.7	No		No
105029126	0.50	1.12	111.7	No		No
105216106	17.54	39.47	3,948.5	Yes	Ag Field	Yes
108902101	72.16	162.36	16,242.7	No		No
7th Street Park	1.92	4.33	433.1	Yes	7th St. Park	Yes
Almeria_F	0.27	0.61	60.6	Yes	Almeria Park	Yes
Anne Shirrells Park	3.87	8.70	870.1	Yes	Anne Shirrells Park	Yes
Aquatic_F	0.59	1.33	133.2	Yes	Fontana Park	Yes
Bryn Mawr Veterans Memorial Park	0.29	0.65	64.6	No		No
Catawba_F	9.31	20.95	2,096.1	Yes	Catawba Park	Yes
Centennial_O	0.97	2.18	218.3	Yes	Ontario Centennial Park	Yes
Crossroads_CH	1.68	3.79	379.2	Yes	Veterans Park	Yes
Elmer Digno Park	1.23	2.76	276.4	Yes	Loma Linda Community Park	Yes
George E. Brown Jr. Park	3.94	8.87	887.8	Yes	Wesley Valley Park	Yes
Hunters_F	0.19	0.43	43.3	Yes	Hunter's Ridge Park	Yes
Koehler_F	0.89	2.01	200.7	Yes	Koehler Park	Yes
Littlefield-Shultis Memorial Park	6.71	15.10	1,510.3	No		No

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<b>BMP ID</b>	<b>BMP Footprint (ac)</b>	<b>Harvest Demand (ac-ft/day)</b>	<b>Area Available for Irrigation (ac)</b>	<b>Facilities within 1000' radius</b>	<b>Facility Name</b>	<b>Harvest &amp; Reuse Feasible?</b>
McDermott_F	1.90	4.28	428.6	Yes	North Heritage Park	Yes
Meadowbrook Park	4.98	11.21	1,121.1	Yes	Meadowbrook Park	Yes
Nunez Park	2.67	6.02	601.9	Yes	Gateway Park	Yes
Oak_F	1.08	2.43	243.0	Yes	Oak Park	Yes
Perris Hill Park	1.97	4.43	443.4	No		No
Ranch_O	0.21	0.47	46.8	No		No
SanSevaine_F	0.19	0.43	43.1	Yes	San Sevaine Park	Yes
Southridge_F	0.95	2.14	214.4	Yes	Southridge Park	Yes
Speicher Park	1.61	3.62	362.1	Yes	Belcher Park	Yes
Strickling_CH	0.76	1.71	171.2	Yes	Strickling park	Yes
SummitHeights_F	0.84	1.90	189.6	Yes	Rosena Park West	Yes
Sycamore_F	0.72	1.62	162.1	Yes	Sycamore Hills Park	Yes
Verdemont Park	2.54	5.71	571.2	Yes	Verdemont Park	Yes
Yucaipa Valley Golf Club	4.72	10.61	1,061.7	Yes	Yucaipa Valley GC	Yes
Yucaipa Equestrian Center	5.60	12.60	1,260.3	No		No



## 6 Cost Effectiveness and Classification of Retrofit Sites

The benefits of implementing retrofit sites have been quantified in terms of impervious area offset by the retrofit site towards the LID and hydromodification requirements for new development and re-development projects, as well as in terms of pollutant load reduction towards each of the identified TMDLs.

This investigation has attempted to classify these retrofit sites into high, medium, and low categories on the basis of cost effectiveness. The classification effort accounted for the two types of retrofit sites that are distinguished by the ownership of the parcel and the existing purpose of the land:

- Local sites and municipal parks that may be investigated by the Co-Permittees for offsite mitigation and TMDL compliance. These sites may potentially be available to project proponents of new development and/or re-development projects that are unable to meet the water quality requirements with onsite mitigation options seeking compliance with the LID and hydromodification through offsite mitigation. The construction, management, and maintenance of these retrofit sites must be established and demonstrated to the governing Permittee or through the Urban Runoff Mitigation Fund, if available.
- Identified flood control basins and/or groundwater recharge basins may be retrofitted into extended detention basins with an infiltration component. Native soils for the majority of these basins are classified in the NRCS hydrologic soil group A, thus are suitable for infiltration. Technical and programmatic feasibilities for retrofitting these basins must be established in collaboration with SBCFCD and the operating water districts. These larger-scale projects will typically help with the compliance of TMDLs and will require the establishment of complex funding and maintenance mechanisms.

The specific cost effectiveness of each retrofit site towards each water quality objective may be considered by the Permittees on an individual basis. The intent of this classification effort is only for planning level comparisons.

### 6.1 Capital Cost Estimates

Total capital costs were estimated for each retrofit site based on the Water Environmental Research Foundation's (WERF) BMP and LID Whole Life Cost Models Version 2.0. The WERF cost model was funded by the U.S. Environmental Protection Agency. The suite of cost spreadsheet models includes notably the three types of structural BMPs being considered at the 72 retrofit sites: infiltration basins, extended detention basins, and curb-contained bioretention systems.

Capital costs for BMPs in the United States range dramatically from region to region due to significant differences in labor rates, system requirements, weather, and other considerations. Capital costs within the model were developed from interviews with stormwater management agencies, literature review, and RSMeans Construction Cost Estimating and Material Pricing (Reed Construction Data, 2009). For the purposes of this analysis, unit costs were updated with the most recent information included in the 2013 version of the RS Means Construction Cost Database. The estimates account for a contingency factor of 20%.



Capital costs associated with underground infiltration chambers were obtained from the engineer's experience with similar design and build projects in Southern California.

Estimated capital costs are summarized in Table 9.

## **6.2 Classification of Retrofit Sites**

One of the objectives of the retrofit study is to classify the retrofit sites based on their cost effectiveness to provide water quality benefits. The classification process is based on the development of a benefit score that is obtained after the development of a deterministic weight of evidence approach. The applied methodology is embedded into the iWATR BMP Assessment & Prioritization Tool (RBF Consulting, 2010). The classification was performed independently and associated an overall benefit score (high, medium, low) to each retrofit BMP. The overall benefit score takes into consideration four separate scores defined by:

- The cost effectiveness towards LID Offset through infiltration (30%) – The cost effectiveness towards offset mitigation for LID compliance was determined as the ratio of the amount of impervious area being offset to the estimated capital cost. The weight associated with this factor is of 30%.
- The cost effectiveness towards Hydromodification Mitigation (30%) - The cost effectiveness towards offset mitigation for hydromodification management was determined as the ratio of the amount of impervious area being offset to the estimated capital cost. The weight associated with this factor is of 30%.
- The cost effectiveness towards TMDL compliance (30%) – The cost effectiveness towards TMDL compliance was determined as the ratio of the annual load reduction of E. Coli in dry-weather runoff to the estimated capital cost. The weight associated with this factor is of 30%.
- The feasibility of harvest and reuse (10%) - The feasibility of implementing a harvest and reuse system was identified for each retrofit site in Section 5.3. The feasibility was determined based on the proximity of a public facility with sufficient landscaped area and the available footprint of the BMP. The weight associated with this factor is of 10%.

Specific cost effectiveness is summarized in Table 9. Four separate aspects were identified as the key factors in classifying the most cost-effective retrofit sites. The following assumptions were made for the development of both the decision tree and the ranking process:

- Several variables are of different dimensions. Variables of independent dimensions are normalized to the highest value to set a basis for comparison between the variables.
- All the events are considered independent and the influence diagram does not consider any relationships.
- The approach is deterministic and does not reflect the potential variations of each of the variables.

For each key factor and variable, a numerical weighting factor was selected based on the best professional judgment. Selecting weighting factors is an attempt to quantify the importance of each variable in regard to the defined water quality objectives of the classification process.



Normalized scores are computed based on the scheme defined by the following equation:

$$Score_i^{N+1} = \sum_j \frac{Score_{i,j}^N}{Score_{max,j}^N}$$

Where:

$Score_i^{N+1}$  = factor score of BMP i at level N+1

$Score_{i,j}^N$  = sub-factor j score of BMP i at level N

$Score_{max,j}^N$  = maximum sub-factor j score for all BMPs at level N

$i^{N+1} = f(i_1^N, \dots, i_k^N)$  for k sub-factors

The overall benefit score is translated into one of the three categories (Low, Medium, High). The identification of score categories was developed using the four different distributions of numerical scores. The classification in benefit scores is summarized in Table 9.

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**Table 9 - Cost Effectiveness and Classification of Retrofit Sites**

BMP ID	Total Capital Costs	Subwatershed	Capital Cost per 10 <sup>9</sup> E. Coli Removed (\$/10 <sup>9</sup> cfu)	Capital Cost per LID Offset Impervious Area (\$/ac)	Capital Cost per HM Offset Impervious Area (\$/ac)	Ranking (High, Medium, Low)
<b>Local Sites for Private Developers and The Urban Runoff Bank Seeking Offset Mitigation</b>						
021018145	\$ 2,521,500	Mill-Cucamonga Creek at Chino-Corona Road	\$ 5.0	\$ 16,500	\$ 9,800	High
McDermott_F	\$ 274,100	Mill-Cucamonga Creek at Chino-Corona Road	\$ 5.3	\$ 17,000	\$ 8,200	High
Catawba_F	\$ 1,277,500	SAR at MWD Crossing	\$ 46.1	\$ 14,300	\$ 17,300	High
Oak_F	\$ 162,700	Mill-Cucamonga Creek at Chino-Corona Road	\$ 29.7	\$ 15,600	\$ 22,700	High
025408111	\$ 658,900	SAR at MWD Crossing	\$ 96.2	\$ 14,800	\$ 17,700	High
Nunez Park	\$ 378,600	SAR at MWD Crossing	\$ 80.5	\$ 16,300	\$ 13,500	High
Anne Shirrells Park	\$ 539,900	SAR at MWD Crossing	\$ 80.1	\$ 17,000	\$ 13,800	High
Yucaipa Valley Golf Club	\$ 489,400	San Timeteo Creek	\$ 11.0	\$ 22,700	\$ 2,300	High
Verdemont Park	\$ 360,100	SAR at MWD Crossing	\$ 12.3	\$ 23,500	\$ 3,500	High
Elmer Digno Park	\$ 139,600	SAR at MWD Crossing	\$ 35.2	\$ 21,600	\$ 8,000	High
Sycamore_F	\$ 114,000	SAR at MWD Crossing	\$ 84.4	\$ 16,700	\$ 27,800	High
Meadowbrook Park	\$ 690,900	SAR at MWD Crossing	\$ 145.1	\$ 14,800	\$ 16,200	High
7th Street Park	\$ 209,400	San Timeteo Creek	\$ 35.1	\$ 23,700	\$ 7,200	High
102835124	\$ 97,400	Prado Park Outlet at Chino Creek	\$ 13.3	\$ 28,000	\$ 2,700	High
Almeria_F	\$ 52,900	SAR at MWD Crossing	\$ 75.0	\$ 25,800	\$ 17,300	High
Southridge_F	\$ 145,500	Mill-Cucamonga Creek at Chino-Corona Road	\$ 226.5	\$ 15,800	\$ 45,500	High
Strickling_CH	\$ 92,700	Prado Park Outlet at Chino Creek	\$ 172.3	\$ 28,700	\$ 18,600	High
103309117	\$ 208,900	Prado Park Outlet at Chino Creek	\$ 284.5	\$ 24,400	\$ 26,900	High
George E. Brown Jr. Park	\$ 550,600	SAR at MWD Crossing	\$ 496.0	\$ 15,200	\$ 23,800	High
Koehler_F	\$ 137,200	SAR at MWD Crossing	\$ 415.8	\$ 20,800	\$ 41,200	High
026006118	\$ 276,100	SAR at MWD Crossing	\$ 569.3	\$ 14,200	\$ 16,500	High
SummitHeights_F	\$ 101,000	SAR at MWD Crossing	\$ 469.3	\$ 33,300	\$ 57,600	High
014125103	\$ 627,800	SAR at MWD Crossing	\$ 7.4	\$ 14,000	\$ 1,800	High
023803129	\$ 276,200	Mill-Cucamonga Creek at Chino-Corona Road	\$ 1.1	\$ 14,900	\$ 1,300	High
011031112	\$ 602,400	Mill-Cucamonga Creek at Chino-Corona Road	\$ 5.1	\$ 17,300	\$ 1,300	High
015328131	\$ 198,900	SAR at MWD Crossing	\$ 7.8	\$ 18,000	\$ 1,100	High
012802134	\$ 361,900	SAR at MWD Crossing	\$ 18.1	\$ 18,000	\$ 4,300	High

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BMP ID	Total Capital Costs	Subwatershed	Capital Cost per 10 <sup>9</sup> E. Coli Removed (\$/10 <sup>9</sup> cfu)	Capital Cost per LID Offset Impervious Area (\$/ac)	Capital Cost per HM Offset Impervious Area (\$/ac)	Ranking (High, Medium, Low)
014218110	\$ 354,300	SAR at MWD Crossing	\$ 68.3	\$ 15,800	\$ 14,800	High
105029126	\$ 83,700	Mill-Cucamonga Creek at Chino-Corona Road	\$ 4.8	\$ 20,400	\$ 13,800	High
027932160	\$ 867,400	SAR at MWD Crossing	\$ 10.8	\$ 21,500	\$ 2,400	High
014218106	\$ 375,000	SAR at MWD Crossing	\$ 99.4	\$ 16,200	\$ 17,900	High
<b>Yucaipa Equestrian Center</b>	\$ 577,900	San Timeteo Creek	\$ 20.2	\$ 23,500	\$ 2,200	High
030113274	\$ 180,600	SAR at MWD Crossing	\$ 34.1	\$ 22,800	\$ 8,600	High
027214142	\$ 258,400	SAR at MWD Crossing	\$ 16.6	\$ 25,100	\$ 4,000	High
022928370	\$ 765,200	SAR at Pedley Avenue	\$ 355.9	\$ 9,500	\$ 20,000	High
103226113	\$ 70,200	Chino Creek at Central Valley	\$ 60.0	\$ 30,900	\$ 1,900	High
<b>Perris Hill Park</b>	\$ 214,000	SAR at MWD Crossing	\$ 270.1	\$ 24,900	\$ 24,400	High
103260142	\$ 540,200	Chino Creek at Central Valley	\$ 236.9	\$ 122,000	\$ 20,000	High
026203115	\$ 1,875,800	SAR at MWD Crossing	\$ 897.5	\$ 21,700	\$ 28,100	High
011001310	\$ 153,000	Mill-Cucamonga Creek at Chino-Corona Road	\$ 107.8	\$ 137,900	\$ 272,000	High
<b>Littlefield-Shultis Memorial Park</b>	\$ 925,100	SAR at MWD Crossing	\$ 1,745.3	\$ 21,000	\$ 44,100	High
016338113	\$ 4,808,900	SAR at MWD Crossing	\$ 102.8	\$ 137,200	\$ 2,000	High
<b>Bryn Mawr Veterans Memorial Park</b>	\$ 207,600	SAR at MWD Crossing	\$ 103.8	\$ 135,400	\$ 29,700	High
<b>Hunters_F</b>	\$ 278,500	SAR at MWD Crossing	\$ 342.9	\$ 219,000	\$ 80,400	Medium
101326117	\$ 564,500	Chino Creek at Central Valley	\$ 330.1	\$ 173,300	\$ 200	Medium
<b>SanSevaine_F</b>	\$ 277,100	SAR at MWD Crossing	\$ 1,338.6	\$ 219,000	\$ 223,700	Medium
<b>Aquatic_F</b>	\$ 855,800	SAR at MWD Crossing	\$ 3,507.4	\$ 212,400	\$ 358,700	Medium
<b>Ranch_O</b>	\$ 287,700	Mill-Cucamonga Creek at Chino-Corona Road	n/a	\$ 121,600	\$ 1,013,400	Low
<b>Centennial_O</b>	\$ 1,269,900	Prado Park Outlet at Chino Creek	n/a	\$ 120,100	\$ 1,957,400	Low
102337170	\$ 538,900	Chino Creek at Central Valley	n/a	\$ 123,200	n/a	Low
030905101	\$ 2,812,300	SAR at MWD Crossing	n/a	n/a	n/a	Low
<b>San Bernardino County Flood Control District - Retrofit of Existing FC Basins &amp; Recharge Basins</b>						
026421317	\$ 299,900	SAR at MWD Crossing	\$ 16.5	\$ 9,900	\$ 5,100	High
021813101	\$ 4,820,700	Mill-Cucamonga Creek at Chino-Corona Road	\$ 2.6	\$ 8,200	\$ 4,800	High
028574212	\$ 203,500	SAR at MWD Crossing	\$ 12.4	\$ 8,900	\$ 2,500	High
104745104	\$ 151,400	Mill-Cucamonga Creek at Chino-Corona Road	\$ 2.9	\$ 9,800	\$ 2,100	High
024907103	\$ 196,400	SAR at MWD Crossing	\$ 9.4	\$ 9,100	\$ 3,300	High

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BMP ID	Total Capital Costs	Subwatershed	Capital Cost per 10 <sup>9</sup> E. Coli Removed (\$/10 <sup>9</sup> cfu)	Capital Cost per LID Offset Impervious Area (\$/ac)	Capital Cost per HM Offset Impervious Area (\$/ac)	Ranking (High, Medium, Low)
023010202	\$ 641,800	Mill-Cucamonga Creek at Chino-Corona Road	\$ 6.4	\$ 7,800	\$ 9,000	High
023812103	\$ 4,476,800	Mill-Cucamonga Creek at Chino-Corona Road	\$ 24.7	\$ 7,700	\$ 7,400	High
021830106	\$ 770,000	Mill-Cucamonga Creek at Chino-Corona Road	\$ 3.4	n/a	\$ 1,200	High
022929109	\$ 1,065,300	Mill-Cucamonga Creek at Chino-Corona Road	\$ 9.7	\$ 7,600	\$ 10,200	High
030312104	\$ 773,900	SAR at MWD Crossing	\$ 44.0	\$ 8,300	\$ 5,900	High
011347203	\$ 3,048,800	Mill-Cucamonga Creek at Chino-Corona Road	\$ 2.9	\$ 8,600	\$ 11,200	High
104712102	\$ 2,179,500	Mill-Cucamonga Creek at Chino-Corona Road	\$ 4.6	\$ 8,800	\$ 13,400	Medium
026528108	\$ 774,300	SAR at MWD Crossing	\$ 42.3	\$ 9,900	\$ 6,200	Medium
108902101	\$ 6,138,700	Mill-Cucamonga Creek at Chino-Corona Road	\$ 9.9	\$ 10,500	\$ 10,400	Medium
020199114	\$ 964,100	Mill-Cucamonga Creek at Chino-Corona Road	\$ 8.0	\$ 10,100	\$ 14,100	Medium
020118315	\$ 2,205,200	Mill-Cucamonga Creek at Chino-Corona Road	\$ 13.2	\$ 10,000	\$ 16,800	Medium
026607209	\$ 273,400	SAR at MWD Crossing	\$ 66.5	\$ 10,300	\$ 11,100	Medium
105216106	\$ 1,261,700	Prado Park Outlet at Chino Creek	\$ 221.7	\$ 8,600	\$ 16,200	Medium
022707113	\$ 1,738,800	SAR at Pedley Avenue	\$ 280.0	\$ 8,700	\$ 18,400	Medium
023809104	\$ 4,420,000	Mill-Cucamonga Creek at Chino-Corona Road	\$ 391.1	\$ 13,400	\$ 45,300	Low



## **7 Summary and Future Steps**

The benefits of implementing specific retrofit sites towards three separate needs: TMDLs, hydromodification management, and LID Offset, have been quantified in this evaluation. Specific constraints identified at each individual site have been collected and evaluated to validate the technical feasibility of these sites based on a desktop-level analysis. Results of the study efforts are summarized for each individual retrofit site in separate cards, as listed in Appendix C. Infiltration-based retrofit BMPs offer significant benefits towards each of the three separate needs. It is to note, however, that several existing flood control retarding basins, acting as recharge basins, have already been identified. Retrofitting these basins to function as infiltration basins may require extensive maintenance and the construction of efficient sediment forebays to prevent any excessive accumulation of sediment.

Specific needs for implementing retrofit sites in the Santa Ana River watershed will derive from the integrated watershed management strategy adopted in the WAP. Two interacting steps that are in line with the efforts performed for this retrofit study and provide added benefits to the Program are foreseen, including:

- The development of individual feasibility studies for each individual selected site that may contribute to compliance with the different requirements set forth in the Permit. The individual feasibility studies may consist of the combination of individual field visit, as-built assessment, constructability evaluation including environmental and traffic assessment, preliminary design, and cost estimate. These elements may provide sufficient background to identify if a retrofit project should be built.
- A prioritization of the retrofit sites may be established upon identifying the need to implement retrofit BMPs in the Santa Ana River watershed to achieve the objectives set forth in the integrated watershed management approach of the WAP. The prioritization schema will classify the retrofit sites based on cost-effectiveness and feasibility considerations, and identify those retrofit sites that may provide the most benefits to the Program.

As identified, the WAP is designed to be a living document so that as more information is developed in the watershed, more barriers to watershed protection principles are identified, and innovative ideas to achieving the WAP objectives are identified, they can be incorporated into the document. Achieving the objectives of the WAP will take time and effective coordination among the Program and watershed stakeholders to effectively implement the WAP program. The WAP objectives have been defined, and as the WAP is further developed, implementation will occur through the identification of action steps to achieve the objectives identified and objectives yet to be developed. Further development of the WAP and implementation of the WAP will also include coordination with Orange and Riverside Counties.



# Appendix A

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# Overall Retrofit Sites Matrix

Overall Characteristics				LID Offset by Infiltration						Harvest and Reuse				Hydromodification			
Zone	Copermittee	BMP ID	SBC Tributary Area (ac)	BMP Type	BMP Footprint (ac)	Soil Group	Infiltration?	Capture Volume/DCV Ratio	Potential Impervious Area Offset (ac)	Harvest Demand (ac-ft/day)	Area Available for Irrigation (ac)	Facilities within 1000' radius	Facility Name	Harvest & Reuse Feasible?	% Impervious	% Imp Increase	Surface Area Offset (AC)
1	CITY OF ONTARIO	011001310	12.5	Bioretention	0.10	A	Yes	8.87%	1.1	0.24	23.5	Yes	D Street Park	Yes	78.1%	4.49%	0.6
1	CITY OF ONTARIO	011031112	33258.7	Infiltration Basin	4.33	A	Yes	0.10%	34.9	9.74	974.0	No		No	37.0%	1.46%	486.4
1	CITY OF ONTARIO	011347203	9234.8	Extended Detention Basin with Infiltration	42.72	A	Yes	3.88%	358.3	96.12	9,615.5	No		No	71.9%	2.95%	272.8
2	CITY OF RIALTO	012802134	3744.6	Infiltration Basin	2.55	A	Yes	0.54%	20.2	5.74	574.2	No		No	54.4%	2.30%	86.1
2	CITY OF SAN BERNARDINO	014125103	46601.2	Infiltration Basin	4.51	A	Yes	0.10%	44.9	10.16	1,016.1	No		No	16.8%	0.76%	353.1
2	CITY OF SAN BERNARDINO	014218106	705.3	Infiltration Basin	2.65	A	Yes	3.30%	23.3	5.96	595.9	No		No	68.6%	2.99%	21.0
2	CITY OF SAN BERNARDINO	014218110	969.8	Infiltration Basin	2.49	A	Yes	2.32%	22.5	5.61	561.5	No		No	68.2%	2.48%	24.0
2	CITY OF SAN BERNARDINO	015328131	11285.8	Infiltration Basin	1.35	A	Yes	0.10%	11.1	3.03	303.2	No		No	6.9%	1.74%	196.4
2	CITY OF COLTON	016338113	3974.1	Infiltration Chamber	3.33	A	Yes	0.88%	35.1	7.48	748.6	No		No	29.6%	27.71%	2,422.1
1	CITY OF RANCHO CUCAMONGA	020118315	1477.2	Extended Detention Basin with Infiltration	30.83	A	Yes	15.03%	222.1	69.38	6,940.5	No		No	52.5%	8.91%	131.7
1	CITY OF RANCHO CUCAMONGA	020199114	1058.4	Extended Detention Basin with Infiltration	95.6	A	Yes	9.03%	95.6	30.04	3,004.8	No		No	50.6%	6.50%	68.8
1	CITY OF ONTARIO	021018145	11844.5	Infiltration Basin	18.50	A	Yes	1.29%	152.8	41.62	4,163.9	Yes	Cucamonga-Guasti Regional Park	Yes	43.2%	2.19%	258.8
1	CITY OF ONTARIO	021813101	47319.3	Extended Detention Basin with Infiltration	67.68	A	Yes	1.24%	588.4	152.28	15,234.5	No		No	46.4%	2.15%	1,015.2
1	CITY OF CHINO	021830106	57223.8	Extended Detention Basin	4.93	C	No	-	-	11.08	1,108.7	Yes	Ag Field	Yes	46.3%	1.14%	653.1
1	CITY OF RANCHO CUCAMONGA	022707113	988.6	Extended Detention Basin with Infiltration	24.26	A	Yes	20.31%	200.8	54.59	5,461.4	Yes	Etiwanda High School	Yes	53.1%	9.56%	94.5
1	CITY OF RANCHO CUCAMONGA	022928370	341.7	Infiltration Basin	80.9	A	Yes	23.68%	80.9	19.19	1,919.7	No		No	64.3%	11.24%	38.4
1	UNINCORPORATED	022929109	3212.9	Extended Detention Basin with Infiltration	14.78	A	Yes	4.39%	140.9	33.24	3,325.7	No		No	57.0%	3.27%	105.1
1	UNINCORPORATED	023010202	2930.1	Extended Detention Basin with Infiltration	8.81	A	Yes	2.82%	82.6	19.82	1,982.8	No		No	59.6%	2.46%	72.1
1	UNINCORPORATED	023803129	28130.6	Infiltration Basin	1.92	A	Yes	0.07%	18.6	4.32	431.7	No		No	34.5%	0.78%	219.3
1	CITY OF FONTANA	023809104	329.9	Extended Detention Basin with Infiltration	62.04	A	Yes	100.00%	329.9	139.58	13,963.7	No		No	73.4%	29.61%	97.7
1	CITY OF ONTARIO	023812103	14204.6	Extended Detention Basin with Infiltration	62.84	A	Yes	4.12%	584.9	141.38	14,143.8	No		No	44.9%	4.28%	609.4
2	CITY OF RIALTO	024907103	3908.7	Extended Detention Basin with Infiltration	2.53	A	Yes	0.55%	21.6	5.70	570.5	No		No	66.6%	1.54%	60.1
2	CITY OF COLTON	025408111	1280.1	Infiltration Basin	4.74	A	Yes	3.49%	44.7	10.67	1,067.8	Yes	Hermosa Cemetery	Yes	65.3%	2.92%	37.4
2	CITY OF COLTON	026006118	90.6	Infiltration Basin	1.92	A	Yes	21.55%	19.5	4.31	431.6	Yes	Agua Mansa Cemetery	Yes	41.4%	18.48%	16.7
2	UNINCORPORATED	026203115	390.9	Infiltration Basin	13.73	A	Yes	22.17%	86.7	30.89	3,090.6	No		No	36.3%	17.12%	66.9
2	CITY OF RIALTO	026421317	3395.9	Extended Detention Basin with Infiltration	30.5	A	Yes	0.90%	30.5	8.98	898.8	Yes	Jerry Eaves Park	Yes	53.6%	1.74%	58.9
2	CITY OF SAN BERNARDINO	026528108	3421.8	Extended Detention Basin with Infiltration	10.68	A	Yes	2.30%	78.6	24.02	2,403.0	No		No	32.8%	3.65%	124.9
2	CITY OF SAN BERNARDINO	026607209	768.0	Extended Detention Basin with Infiltration	3.62	A	Yes	3.46%	26.6	8.14	814.8	No		No	74.6%	3.22%	24.7
2	CITY OF SAN BERNARDINO	027214142	2914.0	Infiltration Basin	2.41	B	Yes	0.35%	10.3	5.43	543.0	No		No	21.1%	2.23%	65.1
2	CITY OF SAN BERNARDINO	027932160	31199.9	Infiltration Basin	8.49	B	Yes	0.13%	40.4	19.09	1,910.1	No		No	30.2%	1.17%	365.5
2	CITY OF HIGHLAND	028574212	3065.6	Extended Detention Basin with Infiltration	23.0	A	Yes	0.75%	23.0	5.93	593.1	No		No	11.8%	2.66%	81.5
3	CITY OF YUCAIPA	030113274	990.9	Infiltration Basin	1.64	B	Yes	0.80%	7.9	3.68	368.4	No		No	22.9%	2.13%	21.1
3	CITY OF YUCAIPA	030312104	3287.6	Extended Detention Basin with Infiltration	10.67	A	Yes	2.84%	93.4	24.01	2,401.8	No		No	26.2%	4.01%	131.7
6	CITY OF BIG BEAR LAKE	030905101	189.3	Biofiltration	2.17	B	Yes	9.35%	0.0	4.89	489.1	Yes	Meadow Park	Yes	59.4%	0.00%	0.0
1	CITY OF CHINO HILLS	100005125	57.3	Bioretention	0.18	B	Yes	3.51%	2.0	0.41	40.8	Yes	Western Hills Country Club	Yes	12.3%	5.45%	3.1
1	UNINCORPORATED	101326117	20700.3	Infiltration Chamber	0.39	A	Yes	0.02%	3.3	0.88	87.9	No		No	28.4%	17.08%	5,495.1
1	CITY OF CHINO HILLS	102337170	17.0	Biofiltration	0.40	C	No	25.78%	4.4	0.90	90.4	Yes	Skyview Park	Yes	79.9%	0.00%	0.0
1	CITY OF CHINO HILLS	102835124	1368.3	Infiltration Basin	0.81	B	Yes	0.25%	3.5	1.82	181.6	Yes	Ag Field	Yes	31.8%	2.66%	36.4
1	CITY OF CHINO HILLS	103226113	1193.7	Infiltration Basin	0.54	B	Yes	0.19%	2.3	1.21	120.6	No		No	33.8%	3.21%	38.3
1	CITY OF CHINO HILLS	103260142	738.5	Bioretention	0.40	B	Yes	0.60%	4.4	0.91	90.7	Yes	Crossroads Parks	Yes	37.6%	3.67%	27.1
1	CITY OF CHINO HILLS	103309117	137.1	Infiltration Basin	1.92	B	Yes	6.25%	8.6	4.32	431.9	Yes	Meadows Park	Yes	67.2%	5.67%	7.8
1	CITY OF UPLAND	104712102	4212.5	Extended Detention Basin with Infiltration	30.47	A	Yes	5.91%	248.9	68.56	6,859.0	No		No	69.9%	3.86%	162.7
1	CITY OF ONTARIO	104745104	4428.6	Extended Detention Basin with Infiltration	15.5	A	Yes	0.35%	15.5	4.28	427.7	No		No	69.6%	1.64%	72.6
1	CITY OF ONTARIO	105029126	324.8	Infiltration Basin	0.50	A	Yes	1.27%	4.1	1.12	111.7	No		No	72.8%	1.87%	6.1
1	CITY OF ONTARIO	105216106	1063.4	Extended Detention Basin with Infiltration	17.54	A	Yes	13.91%	147.9	39.47	3,948.5	Yes	Ag Field	Yes	68.8%	7.35%	78.1
1	CITY OF CHINO	105722118	119454.4	Extended Detention Basin with Infiltration	2.20	B	Yes	0.01%	10.3	4.96	495.9	Yes	Ag Field	Yes	42.7%	3.03%	4,027.0
1	CITY OF RANCHO CUCAMONGA	108902101	5469.3	Extended Detention Basin with Infiltration	72.16	A	Yes	10.76%	588.4	162.36	16,242.7	No		No	7.9%	10.85%	593.2
3	CITY OF YUCAIPA	7th Street Park	1115.9	Infiltration Basin	1.92	B	Yes	0.79%	8.9	4.33	433.1	Yes	7th St. Park	Yes	54.6%	2.63%	29.3
2	CITY OF FONTANA	Almeria_F	131.8	Infiltration Basin	0.27	A	Yes	1.56%	2.1	0.61	60.6	Yes	Almeria Park	Yes	77.7%	2.32%	3.1
2	CITY OF RIALTO	Anderson Park	8942.6	Infiltration Basin	2.00	A	Yes	0.19%	17.2	4.50	450.4	Yes	Anderson Park	Yes	62.6%	1.32%	117.6
2	CITY OF SAN BERNARDINO	Anne Shirrells Park	1259.9	Infiltration Basin	3.87	A	Yes	2.52%	31.8	8.70	870.1	Yes	Anne Shirrells Park	Yes	53.6%	3.11%	39.1
1	CITY OF FONTANA	Aquatic_F	45.5	Infiltration Chamber	0.59	A	Yes	8.85%	4.0	1.33	133.2	Yes	Fontana Park	Yes	60.5%	5.24%	2.4
3	CITY OF LOMA LINDA	Bryn Mawr Veterans Memorial Park	374.5	Infiltration Chamber	0.29	B	Yes	0.41%	1.5	0.65	64.6	No		No	59.7%	1.87%	7.0
2	CITY OF FONTANA	Catawba_F	2725.5	Infiltration Basin	9.31	A	Yes	3.28%	89.3	20.95	2,096.1	Yes	Catawba Park	Yes	60.7%	2.72%	74.2
1	CITY OF ONTARIO	Centennial_O	66.8	Biofiltration	0.97	C	No	15.84%	10.6	2.18	218.3	Yes	Ontario Centennial Park	Yes	55.2%	0.97%	0.6
1	CITY OF CHINO HILLS	Community_CH	823.8	Infiltration Basin	7.56	B	Yes	3.88%	32.0	17.00	1,701.2	Yes	Chino Hills Community Park	Yes	35.1%	6.16%	50.7
1	CITY OF CHINO HILLS	Crossroads_CH	216.8	Infiltration Basin	1.68	B	Yes	3.30%	7.1	3.79	379.2	Yes	Veterans Park	Yes	43.8%	5.52%	12.0
3	CITY OF LOMA LINDA	Elmer Digno Park	741.3	Infiltration Basin	1.23	B	Yes	0.87%	6.5	2.76	276.4	Yes	Loma Linda Community Park	Yes	45.8%	2.36%	17.5
1	CITY OF CHINO HILLS	English_CH	513.1	Wet Pond	1.69	B	Yes	1.39%	7.1	3.81	380.8	Yes	English Springs Park	Yes	32.0%	4.30%	22.1
1	CITY OF UPLAND	Fern_U	752.2	Infiltration Basin	4.5	A	Yes	0.60%	4.5	1.25	124.8	Yes	Fern Reservoir Park	Yes	75.7%	1.80%	13.6
2	CITY OF COLTON	George E. Brown Jr. Park	207.3	Infiltration Basin	3.94	A	Yes	17.52%	36.3	8.87	887.8	Yes	Wesley Valley Park	Yes	53.7%	11.17%	23.1
1	CITY OF CHINO HILLS	Hickory_CH	371.6	Infiltration Basin	0.63	B	Yes	0.72%	2.7	1.41	141.4	No		No	68.9%	3.36%	12.5
1	CITY OF FONTANA	Hunters_F	151.6	Infiltration Chamber	0.19	A	Yes	0.84%	1.3	0.43	43.3	Yes	Hunter's Ridge Park	Yes	60.1%	2.28%	3.5
1	CITY OF FONTANA	Koehler_F	61.6	Infiltration Basin	0.89	A	Yes	10.75%	6.6	2.01	200.7	Yes	Koehler Park	Yes	72.7%	5.42%	3.3
2	CITY OF SAN BERNARDINO	Littlefield-Shultis Memorial Park	99.2	Infiltration Basin	6.71	A	Yes	44.61%	44.2	15.10	1,510.3	No		No	61.7%	21.17%	21.0
1	CITY OF FONTANA	McDermott_F	1994.2	Infiltration Basin	1.90	A	Yes	0.81%	16.2	4.28	428.6	Yes	North Heritage Park	Yes	56.1%	1.68%	33.6
2	CITY OF SAN BERNARDINO	Meadowbrook Park	889.4	Infiltration Basin	4.98	A	Yes	5.26%	46.8	11.21	1,121.1	Yes	Meadowbrook Park	Yes	63.7%	4.82%	42.9
2	CITY OF SAN BERNARDINO	Nunez Park	877.8	Infiltration Basin	2.67	A	Yes	2.65									



# Appendix B

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## Individual Results of the TMDLs Retrofit Analysis

Retrofit Site Characteristics	
Site Name	011001310
Total Tributary Drainage Area (ac)	12.5
Tributary Drainage Area w/in SB County (ac)	12.5
<b>Design Factor</b>	
BMP Footprint (sq.ft)	4552
Porosity for Bio-treatment (%)	0.35
Storage Depth for Bio-treatment (ft)	4
BMP Capacity if Biotreatment (cu.ft)	6372.8

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	18,429.4
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point: Away from watershed compliance point\* Check Figure B-3 of TMDL Technical Report  
 if yes, specify station ID: WW-M5  
 Specify subwatershed: Mill-Cucamonga Creek at Chino-Corona\* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 863\* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0\* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 1.41866E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.02E+04
Expected runoff coefficient C	0.58
Expected annual capture volume (cf)	1.59E+05
Expected annual loading for Fecal Coliform (MPN)	1.36E+12

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00\* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 1.36E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	0%	0%	0%	95%	5%	0%	0%	100%
Estimated Area (ac)	0.00	0.00	0.00	11.94	0.58	0.00	0.00	12.52
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	78.2%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

**Retrofit Site Characteristics**

Site Name	011031112
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Total Tributary Drainage Area (ac)	33,258.7
Tributary Drainage Area w/in SB County (ac)	33,258.7

**Design Factor**

BMP Footprint (sq.ft)	188484
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	203562.72

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
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Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	48,956,747.5
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	3.1%
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-M5	
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	863	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	1.17367E+14	

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
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Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform Influent (MPN/100 mL)	2.16E+04
Expected runoff coefficient C	0.26
Expected annual capture volume (cf)	5.09E+06
Expected annual loading for Fecal Coliform (MPN)	3.12E+13

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	3.12E+13	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	8%	44%	7%	31%	6%	3%	1%	100%
Estimated Area (ac)	2619.49	14693.48	2412.53	10374.92	1911.52	890.94	355.77	33,258.66
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	37.0%

Imperviousness based on SBC Hyd

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	390 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 9123200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1411200)	6590 (1600, 1600)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 300)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 300)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 230)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 216140)	230 (1230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	011347203
Total Tributary Drainage Area (ac)	9,234.8
Tributary Drainage Area w/in SB County (ac)	9,234.8
<b>Design Factor</b>	
BMP Footprint (sq.ft)	1860808
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	2009672.64

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	13,593,684.5
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow: YES

Proximity Compliance point: Away from watershed compliance point\* Check Figure B-3 of TMDL Technical Report  
 if yes, specify station ID: WW-M5  
 Specify subwatershed: Mill-Cucamonga Creek at Chino-Corona\* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 863\* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0\* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 1.04641E+15

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	4.13E+04
Expected runoff coefficient C	0.51
Expected annual capture volume (cf)	5.02E+07
Expected annual loading for Fecal Coliform (MPN)	5.88E+14

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00\* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 5.88E+14

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	9%	0%	22%	55%	5%	7%	2%	100%
Estimated Area (ac)	812.67	9.23	2040.90	5069.93	480.21	618.73	193.93	9,225.61
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	71.9%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (1600, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	012802134
Total Tributary Drainage Area (ac)	3,745.0
Tributary Drainage Area w/in SB County (ac)	3,745.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	111116
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	120005.28

**Dry-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	374,500.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	2.00428E+13	

**Wet-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.95E+04
Expected runoff coefficient C	0.37
Expected annual capture volume (cf)	3.00E+06
Expected annual loading for Fecal Coliform (MPN)	2.50E+13

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	2.50E+13	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	32%	0%	15%	36%	13%	3%	1%	100%
Estimated Area (ac)	1187.17	0.00	561.75	1351.95	486.85	127.33	29.96	3,745.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	54.4%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	300 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	014125103
Total Tributary Drainage Area (ac)	46,599.1
Tributary Drainage Area w/in SB County (ac)	46,601.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	196633
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	212363.64

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	4,659,905.5
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	34.1%
Proximity Compliance point	Away from watershed compliance point
If yes, specify station ID	WW-S1
Specify subwatershed	Santa Ana River at MWD Crossing
Identify expected influent E. Coli (cfu/100 mL)	600
Identify preferred BMP	Infiltration Basin
Identify expected effluent E. Coli (cfu/100 mL)	0
Annual load reduction for E. Coli (cfu)	8.51273E+13

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24
Resulting Fecal Coliform influent (MPN/100 mL)	1.37E+04
Expected runoff coefficient C	0.15
Expected annual capture volume (cf)	5.31E+06
Expected annual loading for Fecal Coliform (MPN)	2.06E+13
Identify preferred BMP	Infiltration Basin
Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00
Annual load reduction for Fecal Coliform (MPN)	2.06E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	6%	69%	3%	9%	7%	4%	2%	100%
Estimated Area (ac)	2656.15	32246.55	1164.98	4193.91	3401.73	1910.56	978.58	46,552.46
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	16.8%

BMP Type	Influent/Effluent Summary Statistics for E. coli (#/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

BMP Type	Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1990 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000 (2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300 (542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650 (707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 216140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	014218106
Total Tributary Drainage Area (ac)	705.0
Tributary Drainage Area w/in SB County (ac)	705.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	115314
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	124539.12

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	70,500.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow: YES

Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-S1  
 Specify subwatershed: Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 600 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 3.77308E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.64E+04
Expected runoff coefficient C	0.48
Expected annual capture volume (cf)	3.11E+06
Expected annual loading for Fecal Coliform (MPN)	3.21E+13

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 3.21E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	12%	0%	12%	57%	5%	9%	5%	100%
Estimated Area (ac)	81.78	0.00	87.42	401.85	32.43	65.57	35.96	705.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	68.7%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	014218110
Total Tributary Drainage Area (ac)	970.0
Tributary Drainage Area w/in SB County (ac)	970.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	108665
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	117358.2

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	97,000.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-S1  
 Specify subwatershed: Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 600 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 5.19133E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.46E+04
Expected runoff coefficient C	0.48
Expected annual capture volume (cf)	2.93E+06
Expected annual loading for Fecal Coliform (MPN)	2.88E+13

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 2.88E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	12%	0%	11%	59%	6%	8%	5%	100%
Estimated Area (ac)	119.31	0.00	102.82	569.39	53.35	77.60	48.50	970.97
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	68.2%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (1600, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	015328131
Total Tributary Drainage Area (ac)	11,285.7
Tributary Drainage Area w/in SB County (ac)	11,285.7
<b>Design Factor</b>	
BMP Footprint (sq.ft)	58683
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	63377.64

**Dry-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	1,128,571.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	42.1%
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	2.54053E+13	

**Wet-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	8.21E+03
Expected runoff coefficient C	0.09
Expected annual capture volume (cf)	1.58E+06
Expected annual loading for Fecal Coliform (MPN)	3.69E+12

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	3.69E+12	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	8%	84%	1%	5%	3%	0%	0%	100%
Estimated Area (ac)	902.86	9434.85	67.71	564.29	304.71	11.29	11.29	#####
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	6.9% Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	145000 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (1600, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	016338113
Total Tributary Drainage Area (ac)	8,740.0
Tributary Drainage Area w/in SB County (ac)	3,974.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	144879
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	156469.32

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	874,000.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	4.67755E+13	

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
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Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	1.62E+04
Expected runoff coefficient C	0.22
Expected annual capture volume (cf)	3.91E+06
Expected annual loading for Fecal Coliform (MPN)	1.79E+13

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	4.68E+13	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	4%	47%	2%	21%	23%	3%	0%	100%
Estimated Area (ac)	384.56	4099.06	183.54	1817.92	2018.94	227.24	8.74	8,740.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	29.6%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	300 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	020118315
Total Tributary Drainage Area (ac)	1,477.0
Tributary Drainage Area w/in SB County (ac)	1,477.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	1343140
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	1450591.2

**Dry-weather TMDL**  
 Select TMDL, if any Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	2,174,144.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-M5	
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	863	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	1.67361E+14	

**Wet-weather TMDL**  
 Select TMDL, if any Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.61E+04
Expected runoff coefficient C	0.36
Expected annual capture volume (cf)	3.63E+07
Expected annual loading for Fecal Coliform (MPN)	2.68E+14

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	2.68E+14	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	6%	19%	0%	54%	13%	8%	0%	100%
Estimated Area (ac)	93.05	277.68	0.00	796.10	194.96	115.21	0.00	1,477.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	52.5%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	300 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	020199114
Total Tributary Drainage Area (ac)	1,058.4
Tributary Drainage Area w/in SB County (ac)	1,058.4
<b>Design Factor</b>	
BMP Footprint (sq.ft)	581496
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	628015.68

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	1,557,994.2
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-M5	
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	863	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	1.19931E+14	

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.14E+04
Expected runoff coefficient C	0.34
Expected annual capture volume (cf)	1.57E+07
Expected annual loading for Fecal Coliform (MPN)	9.52E+13

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	9.52E+13	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	4%	25%	0%	54%	16%	1%	0%	100%
Estimated Area (ac)	45.51	262.49	0.00	570.49	167.23	12.70	0.00	1,058.42
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	50.6%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	300 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (1600, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	021018145
Total Tributary Drainage Area (ac)	11,844.6
Tributary Drainage Area w/in SB County (ac)	11,844.6
<b>Design Factor</b>	
BMP Footprint (sq.ft)	805813
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	870278.04

**Dry-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	17,435,177.6
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	37.4%

Proximity Compliance point: Away from watershed compliance point\* Check Figure B-3 of TMDL Technical Report  
 if yes, specify station ID: WW-M5  
 Specify subwatershed: Mill-Cucamonga Creek at Chino-Corona\* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	863	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	
Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	5.01772E+14	

**Wet-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.59E+04	
Expected runoff coefficient C	0.30	
Expected annual capture volume (cf)	2.18E+07	
Expected annual loading for Fecal Coliform (MPN)	1.60E+14	
Identify preferred BMP	Infiltration Basin	
Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	1.60E+14	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	10%	34%	10%	35%	5%	4%	1%	100%
Estimated Area (ac)	1219.99	4074.53	1219.99	4121.90	592.23	509.32	118.45	#####
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	43.2%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	300 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 11200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	021813101
Total Tributary Drainage Area (ac)	47,319.3
Tributary Drainage Area w/in SB County (ac)	47,319.3
<b>Design Factor</b>	
BMP Footprint (sq.ft)	2948215
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	3184072.2

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	69,653,994.9
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	34.2%
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Proximity Compliance point: Away from watershed compliance point\* Check Figure B-3 of TMDL Technical Report  
 if yes, specify station ID: WW-M5  
 Specify subwatershed: Mill-Cucamonga Creek at Chino-Corona\* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 863\* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0\* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 1.83582E+15

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.47E+04
Expected runoff coefficient C	0.32
Expected annual capture volume (cf)	7.96E+07
Expected annual loading for Fecal Coliform (MPN)	5.57E+14

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00\* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 5.57E+14

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	10%	32%	10%	33%	6%	3%	6%	100%
Estimated Area (ac)	4495.33	15047.53	4921.21	15804.64	2791.84	1561.54	2697.20	#####
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	46.3%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (1600, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	021830106
Total Tributary Drainage Area (ac)	57,243.6
Tributary Drainage Area w/in SB County (ac)	57,223.8
<b>Design Factor</b>	
BMP Footprint (sq.ft)	214551
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	4
BMP Capacity if Biotreatment (cu.ft)	772383.6

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	84,262,579.2
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	6.9%
Proximity Compliance point	Away from watershed compliance point
If yes, specify station ID	WW-M5
Specify subwatershed	Milli-Cucamonga Creek at Chino-Corona
Identify expected influent E. Coli (cfu/100 mL)	863
Identify preferred BMP	Extended Detention Basin
Identify expected effluent E. Coli (cfu/100 mL)	429
Annual load reduction for E. Coli (cfu)	2.23955E+14

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24
Resulting Fecal Coliform influent (MPN/100 mL)	2.50E+04
Expected runoff coefficient C	0.32
Expected annual capture volume (cf)	1.93E+07
Expected annual loading for Fecal Coliform (MPN)	1.37E+14
Identify preferred BMP	Biofiltration
Identify expected effluent Fecal Coliform (cfu/100 mL)	1.85E+04
Annual load reduction for Fecal Coliform (MPN)	3.53E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	17%	26%	12%	30%	6%	3%	6%	100%
Estimated Area (ac)	9559.68	15055.07	6983.72	17115.84	3434.62	1717.31	3377.37	#####
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	46.3% (Imperviousness based)

BMP Type	Influent/Effluent Summary Statistics for E. coli (#/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	3990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	1300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	2800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)		6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04

Source: LACDPW, 2008 - SBPAT

BMP Type	Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 91700)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 18300)	11200 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 21000)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	022707113
Total Tributary Drainage Area (ac)	988.7
Tributary Drainage Area w/in SB County (ac)	988.7
<b>Design Factor</b>	
BMP Footprint (sq.ft)	1056911
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	1141463.88

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	122.0
Daily dry-weather flow at site (gal/day)	120,615.3
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow: YES

Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-54  
 Specify subwatershed: Santa Ana River at Pedley Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 577 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 6.20774E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.46E+04
Expected runoff coefficient C	0.36
Expected annual capture volume (cf)	2.85E+07
Expected annual loading for Fecal Coliform (MPN)	1.99E+14

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 1.99E+14

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	13%	10%	0%	48%	19%	7%	2%	100%
Estimated Area (ac)	127.54	100.84	0.99	476.53	188.83	72.17	20.76	987.66
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	53.1%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	022928370
Total Tributary Drainage Area (ac)	341.7
Tributary Drainage Area w/in SB County (ac)	341.7
<b>Design Factor</b>	
BMP Footprint (sq.ft)	371513
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	401234.04

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	122.0
Daily dry-weather flow at site (gal/day)	41,686.2
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow: YES

Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-54  
 Specify subwatershed: Santa Ana River at Pedley Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 577 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 2.14547E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	5.86E+04
Expected runoff coefficient C	0.44
Expected annual capture volume (cf)	1.00E+07
Expected annual loading for Fecal Coliform (MPN)	1.66E+14

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 1.66E+14

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	10%	0%	53%	0%	19%	16%	1%	100%
Estimated Area (ac)	35.54	0.00	181.78	0.00	66.29	56.04	2.05	341.69
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	64.3%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	022929109
Total Tributary Drainage Area (ac)	3,212.9
Tributary Drainage Area w/in SB County (ac)	3,212.9
<b>Design Factor</b>	
BMP Footprint (sq.ft)	643599
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	695086.92

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	95.0
Daily dry-weather flow at site (gal/day)	305,225.5
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-M5  
 Specify subwatershed: Mill-Cucamonga Creek at Chino-Corona \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 4053 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 1.10345E+14

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.87E+04
Expected runoff coefficient C	0.39
Expected annual capture volume (cf)	1.74E+07
Expected annual loading for Fecal Coliform (MPN)	1.41E+14

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 1.41E+14

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	21%	0%	16%	29%	27%	3%	4%	100%
Estimated Area (ac)	665.07	0.00	526.92	941.38	851.42	80.32	134.94	3,200.05
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	56.9%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900) (1030 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000) (12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300) (1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000) (2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300) (542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650) (707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	023010202
Total Tributary Drainage Area (ac)	2,930.1
Tributary Drainage Area w/in SB County (ac)	2,930.1
<b>Design Factor</b>	
BMP Footprint (sq.ft)	383710
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	414406.8

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	95.0
Daily dry-weather flow at site (gal/day)	278,354.8
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow: YES

Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 if yes, specify station ID: WW-M5  
 Specify subwatershed: Mill-Cucamonga Creek at Chino-Corona \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 4053 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 1.00631E+14

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.14E+04
Expected runoff coefficient C	0.41
Expected annual capture volume (cf)	1.04E+07
Expected annual loading for Fecal Coliform (MPN)	9.21E+13

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 9.21E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	16%	0%	19%	31%	27%	3%	4%	100%
Estimated Area (ac)	477.60	0.00	547.92	920.04	791.13	87.90	105.48	2,930.05
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	59.6%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	023803129
Total Tributary Drainage Area (ac)	28,130.6
Tributary Drainage Area w/in SB County (ac)	28,130.4
<b>Design Factor</b>	
BMP Footprint (sq.ft)	83539
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	90222.12

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	95.0
Daily dry-weather flow at site (gal/day)	2,672,407.0
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	25.3%
Proximity Compliance point	Away from watershed compliance point
If yes, specify station ID	WW-M5
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona
Identify expected influent E. Coli (cfu/100 mL)	4053
Identify preferred BMP	Infiltration Basin
Identify expected effluent E. Coli (cfu/100 mL)	0
Annual load reduction for E. Coli (cfu)	2.44302E+14

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24
Resulting Fecal Coliform influent (MPN/100 mL)	1.89E+04
Expected runoff coefficient C	0.25
Expected annual capture volume (cf)	2.26E+06
Expected annual loading for Fecal Coliform (MPN)	1.21E+13
Identify preferred BMP	Infiltration Basin
Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00
Annual load reduction for Fecal Coliform (MPN)	1.21E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	10%	39%	6%	22%	19%	2%	1%	100%
Estimated Area (ac)	2925.58	10886.54	1800.36	6216.86	5457.34	534.48	281.31	#####
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	34.5%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (500, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	02389104
Total Tributary Drainage Area (ac)	329.9
Tributary Drainage Area w/in SB County (ac)	329.9
<b>Design Factor</b>	
BMP Footprint (sq.ft)	2702296
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	2918479.68

**Dry-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	95.0
Daily dry-weather flow at site (gal/day)	31,336.7
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-M5	
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	4053	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	1.13288E+13	

**Wet-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	5.69E+04
Expected runoff coefficient C	0.53
Expected annual capture volume (cf)	7.30E+07
Expected annual loading for Fecal Coliform (MPN)	1.18E+15

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	1.18E+15	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	21%	0%	69%	0%	2%	0%	8%	100%
Estimated Area (ac)	68.28	0.00	227.93	0.00	6.93	0.00	26.72	329.86
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	73.4%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	023812103
Total Tributary Drainage Area (ac)	14,204.6
Tributary Drainage Area w/in SB County (ac)	14,204.6
<b>Design Factor</b>	
BMP Footprint (sq.ft)	2737135
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	2956105.8

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	165.0
Daily dry-weather flow at site (gal/day)	2,343,757.4
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-M5	
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	868	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	1.81463E+14	

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.39E+04
Expected runoff coefficient C	0.31
Expected annual capture volume (cf)	7.39E+07
Expected annual loading for Fecal Coliform (MPN)	7.10E+14

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	7.10E+14	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	15%	32%	31%	13%	6%	2%	2%	100%
Estimated Area (ac)	2088.07	4545.47	4389.22	1803.98	866.48	284.09	241.48	#####
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	44.9%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (1600, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	024907103
Total Tributary Drainage Area (ac)	3,908.7
Tributary Drainage Area w/in SB County (ac)	3,908.7
<b>Design Factor</b>	
BMP Footprint (sq.ft)	110406
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	119238.48

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	390,867.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow: YES

Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-S1  
 Specify subwatershed: Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 600 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 2.09188E+13

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.83E+04
Expected runoff coefficient C	0.46
Expected annual capture volume (cf)	2.98E+06
Expected annual loading for Fecal Coliform (MPN)	2.39E+13

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 2.39E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	4%	0%	11%	38%	28%	5%	14%	100%
Estimated Area (ac)	160.26	0.00	437.77	1485.29	1110.06	179.80	531.58	3,904.76
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	66.6%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	025408111
Total Tributary Drainage Area (ac)	1,280.1
Tributary Drainage Area w/in SB County (ac)	1,280.1
<b>Design Factor</b>	
BMP Footprint (sq.ft)	206650
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	223182

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	128,012.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	6.85105E+12	

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
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Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.94E+04
Expected runoff coefficient C	0.45
Expected annual capture volume (cf)	5.58E+06
Expected annual loading for Fecal Coliform (MPN)	6.22E+13

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	6.22E+13	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	9%	0%	8%	55%	6%	18%	3%	100%
Estimated Area (ac)	117.77	0.00	98.57	705.35	79.37	235.54	42.24	1,278.84
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	65.3%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (1600, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	026006118
Total Tributary Drainage Area (ac)	90.6
Tributary Drainage Area w/in SB County (ac)	90.6
<b>Design Factor</b>	
BMP Footprint (sq.ft)	83524
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	90205.92

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	9,058.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-S1  
 Specify subwatershed: Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 600 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 4.84774E+11

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	1.68E+04
Expected runoff coefficient C	0.29
Expected annual capture volume (cf)	2.26E+06
Expected annual loading for Fecal Coliform (MPN)	1.07E+13

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 1.07E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	11%	0%	8%	0%	81%	0%	0%	100%
Estimated Area (ac)	9.69	0.00	7.43	0.00	73.46	0.00	0.00	90.58
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	41.4%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900) (1030 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000) (12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300) (1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000) (2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300) (542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650) (707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	026203115
Total Tributary Drainage Area (ac)	390.9
Tributary Drainage Area w/in SB County (ac)	390.9
<b>Design Factor</b>	
BMP Footprint (sq.ft)	598098
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	645945.84

**Dry-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	39,086.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	2.09184E+12	

**Wet-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	7.31E+04
Expected runoff coefficient C	0.26
Expected annual capture volume (cf)	1.61E+07
Expected annual loading for Fecal Coliform (MPN)	3.34E+14

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	3.34E+14	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	0%	9%	0%	0%	0%	91%	0%	100%
Estimated Area (ac)	0.00	35.96	0.00	0.00	0.00	354.90	0.00	390.86
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	36.3%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900) (1030 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000) (12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300) (1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000) (2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300) (542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650) (707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	026421317
Total Tributary Drainage Area (ac)	3,395.9
Tributary Drainage Area w/in SB County (ac)	3,395.9
<b>Design Factor</b>	
BMP Footprint (sq.ft)	173938
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	187853.04

**Dry-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	339,594.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	1.81747E+13	

**Wet-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.99E+04
Expected runoff coefficient C	0.36
Expected annual capture volume (cf)	4.70E+06
Expected annual loading for Fecal Coliform (MPN)	3.98E+13

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	3.98E+13	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	33%	0%	16%	34%	13%	4%	0%	100%
Estimated Area (ac)	1124.06	0.00	543.35	1158.02	431.28	125.65	13.58	3,395.94
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	53.6%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	026528108
Total Tributary Drainage Area (ac)	3,421.8
Tributary Drainage Area w/in SB County (ac)	3,421.8
<b>Design Factor</b>	
BMP Footprint (sq.ft)	465036
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	502238.88

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	342,184.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	1.83133E+13	

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
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Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.57E+04
Expected runoff coefficient C	0.24
Expected annual capture volume (cf)	1.26E+07
Expected annual loading for Fecal Coliform (MPN)	9.13E+13

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	9.13E+13	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	7%	44%	1%	29%	4%	15%	0%	100%
Estimated Area (ac)	246.37	1498.77	37.64	988.91	130.03	520.12	0.00	3,421.84
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	32.8%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	026607209
Total Tributary Drainage Area (ac)	768.0
Tributary Drainage Area w/in SB County (ac)	768.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	157686
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	170300.88

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	76,800.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow: YES

Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-S1  
 Specify subwatershed: Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 600 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 4.11025E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	4.65E+04
Expected runoff coefficient C	0.54
Expected annual capture volume (cf)	4.26E+06
Expected annual loading for Fecal Coliform (MPN)	5.61E+13

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 5.61E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	2%	2%	40%	39%	15%	1%	1%	100%
Estimated Area (ac)	16.90	17.66	305.66	300.29	114.43	4.61	8.45	768.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	74.6%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	027214142
Total Tributary Drainage Area (ac)	2,914.0
Tributary Drainage Area w/in SB County (ac)	2,914.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	105081
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	56743.74

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	291,398.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	1.55953E+13	

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
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Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	1.42E+04
Expected runoff coefficient C	0.18
Expected annual capture volume (cf)	1.42E+06
Expected annual loading for Fecal Coliform (MPN)	5.69E+12

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	5.69E+12	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	4%	68%	0%	22%	3%	3%	0%	100%
Estimated Area (ac)	119.47	1972.76	11.66	649.82	72.85	75.76	5.83	2,908.15
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	21.1%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	02793160
Total Tributary Drainage Area (ac)	31,199.9
Tributary Drainage Area w/in SB County (ac)	31,199.9
<b>Design Factor</b>	
BMP Footprint (sq.ft)	369653
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	199612.62

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	3,119,985.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	47.9%
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Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 if yes, specify station ID: WW-S1  
 Specify subwatershed: Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 600 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 8.00159E+13

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	1.93E+04
Expected runoff coefficient C	0.23
Expected annual capture volume (cf)	4.99E+06
Expected annual loading for Fecal Coliform (MPN)	2.73E+13

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 2.73E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	7%	51%	3%	25%	6%	6%	1%	100%
Estimated Area (ac)	2189.79	15977.15	1045.23	7838.19	1965.27	1720.07	464.13	#####
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	30.2% Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 555000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	028574212
Total Tributary Drainage Area (ac)	3,065.6
Tributary Drainage Area w/in SB County (ac)	3,065.6
<b>Design Factor</b>	
BMP Footprint (sq.ft)	114779
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	123961.32

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	306,560.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	1.64067E+13	

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
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Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	1.31E+04
Expected runoff coefficient C	0.12
Expected annual capture volume (cf)	3.10E+06
Expected annual loading for Fecal Coliform (MPN)	1.15E+13

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	1.15E+13	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	4%	76%	1%	6%	6%	6%	1%	100%
Estimated Area (ac)	122.62	2332.92	24.52	183.94	190.07	183.94	27.59	3,065.60
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	11.8%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	030113274
Total Tributary Drainage Area (ac)	990.9
Tributary Drainage Area w/in SB County (ac)	990.9
<b>Design Factor</b>	
BMP Footprint (sq.ft)	71293
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	38498.22

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	99,086.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow: YES

Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-S1  
 Specify subwatershed: Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 600 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 5.30297E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.08E+04
Expected runoff coefficient C	0.19
Expected annual capture volume (cf)	9.62E+05
Expected annual loading for Fecal Coliform (MPN)	5.68E+12

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 5.68E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	5%	57%	2%	14%	10%	12%	0%	100%
Estimated Area (ac)	52.52	559.84	19.82	141.69	95.12	120.88	0.99	990.86
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	22.8%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	030213104
Total Tributary Drainage Area (ac)	3,287.6
Tributary Drainage Area w/in SB County (ac)	3,287.6
<b>Design Factor</b>	
BMP Footprint (sq.ft)	464794
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	501977.52

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	328,761.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	1.75949E+13	

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	1.34E+04
Expected runoff coefficient C	0.21
Expected annual capture volume (cf)	1.25E+07
Expected annual loading for Fecal Coliform (MPN)	4.77E+13

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	4.77E+13	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	11%	45%	2%	14%	28%	1%	0%	100%
Estimated Area (ac)	351.77	1462.99	62.46	463.55	904.09	32.88	9.86	3,287.61
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	26.3%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900) (1030 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000) (12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300) (1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000) (2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300) (542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650) (707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	030905101
Total Tributary Drainage Area (ac)	188.3
Tributary Drainage Area within SB County (ac)	188.3
<b>Design Factor</b>	
BMP Longevity (yrs)	94(0.3)
Porosity for Bio-treatment (%)	0.35
Storage Depth for Bio-treatment (ft)	4
BMP Capacity if Bioretention (cu ft)	132522.6

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	23%	8%	9%	60%	1%	0%	0%	100%
Estimated Area (ac)	43.92	14.39	16.09	113.59	1.33	0.00	0.00	189.31
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	59.4%

Imperviousness based on SBC Hydrology Manual Figure C-4

**Dry hydrological conditions TMDL**  
 Correct TMDL if any Big Bear Nutrient for dry hydrological conditions

Based on amendment to Resolution R8-2006-0023

TP Waste Load Allocation for Urban Use (lbs/yr)	475
TP Loading at retrofit site (lbs/yr)	12.07

Limited benefits from using BMPs except for infiltration basins or bioretention w/o underdrains (100%)

Numbers from Tetra Tech Watershed Model

H:\pdata\10107840\Project Info\Big Bear\Strategic Plan-Big Bear\Load Calc\BigBear\sedimentandwaterquality\_rwqcb\_rev\_20120312.xls

BMP Type	Effluent Summary Statistics for TN and TP (mg/L)		
	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Mercury
Infiltration Basin	0.00	0.00	
Wet Basin	1.28	0.10	No Data
Constructed Wetland	1.19	0.08	
Extended Detention Basin	2.37	0.22	
Media Filter	0.82	0.03	
Biofiltration with underdrains	0.80	0.09	
Bioretention	0.00	0.00	

\* Dec 2012 BMP Database Categorical Summary

Land Use	Land Use Acres from Staff Report		
	Impervious	Parvious	Total
Forest North		38	7595
Forest South		35	6876
Resort		35	660
Residential		580	3287
High Density Urban		644	644

2011 TMDL monitoring data

Location	Boulder Creek	Grout Creek	Knickerbocker	Rathbun Creek	Rathbun Creek	Summit Creek
	Total Phosphorus as P (mg/L)					
Sample Count	2	6	9	9	9	7
Mean	0.016	0.025	0.103	0.053	0.058	0.078
Median	0.016	0.024	0.072	0.041	0.038	0.08
Range of Values	0.014 - 0.017	0.019 - 0.037	0.023 - 0.32	0.02 - 0.118	0.03 - 0.135	0.05 - 0.111
Standard Deviation	0.002	0.007	0.093	0.031	0.037	0.021
Sample Count	2	9	9	9	9	7
Mean	0.635	0.312	0.273	0.690	1.708	0.559
Median	0.635	0.295	0.272	0.666	1.375	0.479
Range of Values	0.166 - 1.103	0.083 - 0.516	0.144 - 0.396	0.322 - 1.164	0.884 - 3.353	0.348 - 0.851
Standard Deviation	0.663	0.155	0.090	0.274	1.005	0.207

Retrofit Site Characteristics	
Site Name	101326117
Total Tributary Drainage Area (ac)	32,176.5
Tributary Drainage Area w/in SB County (ac)	20,700.3
<b>Design Factor</b>	
BMP Footprint (sq.ft)	17005
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	18365.4

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	2396.0
Daily dry-weather flow at site (gal/day)	77,094,941.9
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	0.2%
Proximity Compliance point	Away from watershed compliance point
If yes, specify station ID	WW-C7
Specify subwatershed	Chino Creek at Central Ave
Identify expected influent E. Coli (cfu/100 mL)	139
Identify preferred BMP	Infiltration Basin
Identify expected effluent E. Coli (cfu/100 mL)	0
Annual load reduction for E. Coli (cfu)	1.7055E+12

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24
Resulting Fecal Coliform influent (MPN/100 mL)	2.05E+04
Expected runoff coefficient C	0.22
Expected annual capture volume (cf)	4.59E+05
Expected annual loading for Fecal Coliform (MPN)	2.66E+12
Identify preferred BMP	Infiltration Basin
Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00
Annual load reduction for Fecal Coliform (MPN)	2.66E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	5%	59%	12%	16%	4%	2%	2%	100%
Estimated Area (ac)	1512.30	19080.68	3829.01	5180.42	1383.59	547.00	611.35	#####
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	28.4%

Imperviousness based

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
	Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
	Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	102337170
Total Tributary Drainage Area (ac)	17.0
Tributary Drainage Area w/in SB County (ac)	17.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	17501
Porosity for Bio-treatment (%)	0.35
Storage Depth for Bio-treatment (ft)	4
BMP Capacity if Biotreatment (cu.ft)	24501.4

**Dry-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	91.0
Daily dry-weather flow at site (gal/day)	1,544.3
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-C7	
Specify subwatershed	Chino Creek at Central Ave	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	412	* per Appendix B of Technical Report
Identify preferred BMP	Biofiltration	

Identify expected effluent E. Coli (cfu/100 mL)	412	No reduction expected based on available statistical data
Annual load reduction for E. Coli (cfu)	0.00E+00	

**Wet-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.11E+04
Expected runoff coefficient C	0.60
Expected annual capture volume (cf)	6.13E+05
Expected annual loading for Fecal Coliform (MPN)	5.39E+12

Identify preferred BMP	Biofiltration
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Identify expected effluent Fecal Coliform (cfu/100 mL)	2.32E+04	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	1.36E+12	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	0%	0%	0%	100%	0%	0%	0%	100%
Estimated Area (ac)	0.03	0.00	0.00	16.94	0.00	0.00	0.00	16.97
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	79.9%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)1030 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	103226113
Total Tributary Drainage Area (ac)	1,193.7
Tributary Drainage Area w/in SB County (ac)	1,193.7
<b>Design Factor</b>	
BMP Footprint (sq.ft)	23347
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	12607.38

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	2396.0
Daily dry-weather flow at site (gal/day)	2,860,105.2
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	3.3%
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Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 if yes, specify station ID: WW-C7 \* Check Figure B-3 of TMDL Technical Report  
 Specify subwatershed: Chino Creek at Central Ave

Identify expected influent E. Coli (cfu/100 mL): 139 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 1.17078E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	1.78E+04
Expected runoff coefficient C	0.25
Expected annual capture volume (cf)	3.15E+05
Expected annual loading for Fecal Coliform (MPN)	1.59E+12

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 1.59E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	6%	51%	1%	38%	1%	1%	0%	100%
Estimated Area (ac)	76.40	612.37	14.32	458.38	16.71	16.71	0.00	1,194.89
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	33.8%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)1030 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	103260142
Total Tributary Drainage Area (ac)	738.5
Tributary Drainage Area w/in SB County (ac)	738.5
<b>Design Factor</b>	
BMP Footprint (sq.ft)	17544
Porosity for Bio-treatment (%)	0.35
Storage Depth for Bio-treatment (ft)	4
BMP Capacity if Biotreatment (cu.ft)	24561.6

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	2396.0
Daily dry-weather flow at site (gal/day)	1,769,350.2
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	10.4%
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Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 if yes, specify station ID: WW-C7 \* Check Figure B-3 of TMDL Technical Report  
 Specify subwatershed: Chino Creek at Central Ave

Identify expected influent E. Coli (cfu/100 mL): 139 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 2.28091E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	1.98E+04
Expected runoff coefficient C	0.27
Expected annual capture volume (cf)	6.14E+05
Expected annual loading for Fecal Coliform (MPN)	3.45E+12

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 3.45E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	6%	47%	2%	43%	0%	2%	0%	100%
Estimated Area (ac)	42.83	348.55	13.29	314.58	2.95	16.25	0.00	738.46
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	37.6%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	103309117
Total Tributary Drainage Area (ac)	137.1
Tributary Drainage Area w/in SB County (ac)	137.1
<b>Design Factor</b>	
BMP Footprint (sq.ft)	83578
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	90264.24

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	13,711.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow: YES

Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-C3 \* Check Figure B-3 of TMDL Technical Report  
 Specify subwatershed: Prado Park Lake

Identify expected influent E. Coli (cfu/100 mL): 600 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 7.33797E+11

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.73E+04
Expected runoff coefficient C	0.47
Expected annual capture volume (cf)	2.26E+06
Expected annual loading for Fecal Coliform (MPN)	1.74E+13

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 1.74E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	6%	11%	0%	83%	0%	1%	0%	100%
Estimated Area (ac)	8.09	14.81	0.00	113.25	0.00	0.96	0.00	137.11
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	67.2%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900) (1030 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000) (12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300) (1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000) (2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300) (542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650) (707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	104712102
Total Tributary Drainage Area (ac)	4,212.5
Tributary Drainage Area w/in SB County (ac)	4,212.5
<b>Design Factor</b>	
BMP Footprint (sq.ft)	1327373
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	1433562.84

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	6,200,814.7
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-M5	
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	863	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	4.77326E+14	

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
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Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.66E+04
Expected runoff coefficient C	0.49
Expected annual capture volume (cf)	3.58E+07
Expected annual loading for Fecal Coliform (MPN)	3.71E+14

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	3.71E+14	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	11%	0%	11%	66%	3%	8%	1%	100%
Estimated Area (ac)	459.16	0.00	467.59	2780.26	122.16	324.36	54.76	4,208.30
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	69.9%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	104745104
Total Tributary Drainage Area (ac)	4,428.6
Tributary Drainage Area w/in SB County (ac)	4,428.6
<b>Design Factor</b>	
BMP Footprint (sq.ft)	82765
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	89386.2

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	6,518,869.8
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	10.3%
Proximity Compliance point	Away from watershed compliance point
If yes, specify station ID	WW-M5
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona
Identify expected influent E. Coli (cfu/100 mL)	863
Identify preferred BMP	Infiltration Basin
Identify expected effluent E. Coli (cfu/100 mL)	0
Annual load reduction for E. Coli (cfu)	5.15369E+13

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24
Resulting Fecal Coliform influent (MPN/100 mL)	3.65E+04
Expected runoff coefficient C	0.49
Expected annual capture volume (cf)	2.23E+06
Expected annual loading for Fecal Coliform (MPN)	2.31E+13
Identify preferred BMP	Infiltration Basin
Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00
Annual load reduction for Fecal Coliform (MPN)	2.31E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	11%	0%	11%	66%	3%	8%	1%	100%
Estimated Area (ac)	500.43	4.43	482.72	2922.86	124.00	341.00	57.57	4,433.01
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	69.6%

Imperviousness based

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
	Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
	Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	105029126
Total Tributary Drainage Area (ac)	324.8
Tributary Drainage Area w/in SB County (ac)	324.8
<b>Design Factor</b>	
BMP Footprint (sq.ft)	21616
Porosity for Bio-treatment (%)	0.35
Storage Depth for Bio-treatment (ft)	4
BMP Capacity if Biotreatment (cu.ft)	30262.4

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	478,120.3
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	47.4%

Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 if yes, specify station ID: WW-M5  
 Specify subwatershed: Mill-Cucamonga Creek at Chino-Corona \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	863	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	
Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	1.74482E+13	

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.09E+04
Expected runoff coefficient C	0.52
Expected annual capture volume (cf)	7.57E+05
Expected annual loading for Fecal Coliform (MPN)	6.61E+12

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	6.61E+12	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	0%	0%	3%	78%	16%	3%	0%	100%
Estimated Area (ac)	0.00	0.00	9.74	254.33	51.97	9.09	0.00	325.13
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	72.8%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (1600, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	105216106
Total Tributary Drainage Area (ac)	1,063.4
Tributary Drainage Area w/in SB County (ac)	1,068.4
<b>Design Factor</b>	
BMP Footprint (sq.ft)	764131
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	825261.48

**Dry-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	106,338.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-C3	
Specify subwatershed	Prado Park Lake	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	5.69109E+12	

**Wet-weather TMDL**  
 Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	4.27E+04
Expected runoff coefficient C	0.48
Expected annual capture volume (cf)	2.06E+07
Expected annual loading for Fecal Coliform (MPN)	2.49E+14

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	2.49E+14	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	13%	0%	26%	49%	6%	7%	0%	100%
Estimated Area (ac)	140.37	0.00	271.16	517.87	63.80	74.44	0.00	1,067.63
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	68.8%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900) (1030 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000) (12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300) (1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000) (2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300) (542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650) (707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	108902101
Total Tributary Drainage Area (ac)	5,469.4
Tributary Drainage Area w/in SB County (ac)	5,469.4
<b>Design Factor</b>	
BMP Footprint (sq.ft)	3143321
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	3394786.68

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	8,050,883.2
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-M5	
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	863	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	6.1974E+14	

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
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Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	8.85E+03
Expected runoff coefficient C	0.10
Expected annual capture volume (cf)	8.49E+07
Expected annual loading for Fecal Coliform (MPN)	2.13E+14

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	2.13E+14	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	19%	74%	1%	5%	0%	1%	0%	100%
Estimated Area (ac)	1028.24	4063.73	43.75	268.00	5.47	54.69	5.47	5,469.35
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	8.0%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200)	6590 (1600, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

**Retrofit Site Characteristics**

Site Name	7th Street Park
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Total Tributary Drainage Area (ac)	1,115.9
Tributary Drainage Area w/in SB County (ac)	1,115.9

<b>Design Factor</b>	
BMP Footprint (sq ft)	83820
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	45262.8

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	111,591.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed (San Timoteo Creek)	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	5.97222E+12	

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.77E+04
Expected runoff coefficient C	0.37
Expected annual capture volume (cf)	1.13E+06
Expected annual loading for Fecal Coliform (MPN)	8.86E+12

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	8.86E+12	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	12%	9%	9%	41%	25%	4%	0%	100%
Estimated Area (ac)	133.46	96.13	100.99	457.10	277.85	48.24	2.14	1,115.91
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	54.6%

Imperviousness based on SBC Hyd

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	1300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)		6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 9123000)	145000 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 181200)	16590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (900, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (670, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 216140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Almeria_F
Total Tributary Drainage Area (ac)	131.8
Tributary Drainage Area w/in SB County (ac)	131.8
<b>Design Factor</b>	
BMP Footprint (sq.ft)	11728
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	12666.24

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	13,181.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	7.05432E+11	

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
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Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.05E+04
Expected runoff coefficient C	0.57
Expected annual capture volume (cf)	3.17E+05
Expected annual loading for Fecal Coliform (MPN)	2.73E+12

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	2.73E+12	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	2%	0%	0%	95%	3%	1%	0%	100%
Estimated Area (ac)	1.98	0.00	0.00	125.61	3.56	0.66	0.00	131.81
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	77.7%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Anne Shirrell Park
Total Tributary Drainage Area (ac)	1,259.9
Tributary Drainage Area w/in SB County (ac)	1,259.9
<b>Design Factor</b>	
BMP Footprint (sq.ft)	168376
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	181846.08

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	125,993.0
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	YES
Proximity Compliance point	Away from watershed compliance point
If yes, specify station ID	WW-S1
Specify subwatershed	Santa Ana River at MWD Crossing
Identify expected influent E. Coli (cfu/100 mL)	600
Identify preferred BMP	Infiltration Basin
Identify expected effluent E. Coli (cfu/100 mL)	0
Annual load reduction for E. Coli (cfu)	6.743E+12

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24
Resulting Fecal Coliform influent (MPN/100 mL)	3.29E+04
Expected runoff coefficient C	0.36
Expected annual capture volume (cf)	4.55E+06
Expected annual loading for Fecal Coliform (MPN)	4.23E+13
Identify preferred BMP	Infiltration Basin
Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00
Annual load reduction for Fecal Coliform (MPN)	4.23E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	18.9%	13.9%	17.6%	34.6%	6.0%	6.5%	2.4%	100%
Estimated Area (ac)	238.47	175.21	222.29	436.55	75.01	81.80	30.60	1,259.93
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	53.6%

Imperviousness based

BMP Type	Influent/Effluent Summary Statistics for E. coli (#/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

BMP Type	Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	2300 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (1600, 36700)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1990)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 21610)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Aquatic_F
Total Tributary Drainage Area (ac)	45.5
Tributary Drainage Area w/in SB County (ac)	45.5
<b>Design Factor</b>	
BMP Footprint (sq.ft)	25783
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	27845.64

**Dry-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	4,552.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID WW-S1  
 Specify subwatershed Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL) 600 \* per Appendix B of Technical Report  
 Identify preferred BMP Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL) 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu) 2.43618E+11

**Wet-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.31E+04
Expected runoff coefficient C	0.41
Expected annual capture volume (cf)	6.96E+05
Expected annual loading for Fecal Coliform (MPN)	4.55E+12

Identify preferred BMP Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL) 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN) 4.55E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	0%	2%	3%	50%	45%	0%	0%	100%
Estimated Area (ac)	0.00	0.95	1.16	22.79	20.61	0.00	0.00	45.52
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	60.5%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	32000 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Bryn Mawr Veterans Memorial Park
Total Tributary Drainage Area (ac)	374.5
Tributary Drainage Area w/in SB County (ac)	374.5
<b>Design Factor</b>	
BMP Footprint (sq.ft)	12503
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	6751.62

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	37,452.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-S1  
 Specify subwatershed: Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 600 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 2.00439E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.41E+04
Expected runoff coefficient C	0.41
Expected annual capture volume (cf)	1.69E+05
Expected annual loading for Fecal Coliform (MPN)	1.15E+12

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 1.15E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	27%	2%	0%	67%	2%	1%	1%	100%
Estimated Area (ac)	100.32	8.72	0.89	249.66	5.63	5.23	4.08	374.52
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	59.7%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Catawba_F
Total Tributary Drainage Area (ac)	2,725.5
Tributary Drainage Area w/in SB County (ac)	2,725.5
<b>Design Factor</b>	
BMP Footprint (sq.ft)	405643
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	438094.44

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	623.0
Daily dry-weather flow at site (gal/day)	1,697,980.3
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-S1  
 Specify subwatershed: Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 183 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 2.77166E+13

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.44E+04
Expected runoff coefficient C	0.41
Expected annual capture volume (cf)	1.10E+07
Expected annual loading for Fecal Coliform (MPN)	1.07E+14

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 1.07E+14

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	9%	1%	21%	29%	33%	5%	2%	100%
Estimated Area (ac)	235.15	28.59	569.46	796.40	893.17	138.48	64.24	2,725.49
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	60.7%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	32000 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (1600, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Centennial_O
Total Tributary Drainage Area (ac)	66.8
Tributary Drainage Area w/in SB County (ac)	66.8
<b>Design Factor</b>	
BMP Footprint (sq.ft)	42246
Porosity for Bio-treatment (%)	0.35
Storage Depth for Bio-treatment (ft)	4
BMP Capacity if Biotreatment (cu.ft)	59144.4

**Dry-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	6,678.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow YES

Proximity Compliance point Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 if yes, specify station ID WW-C3  
 Specify subwatershed Prado Park Lake \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL) 600 \* per Appendix B of Technical Report  
 Identify preferred BMP Biofiltration

Identify expected effluent E. Coli (cfu/100 mL) 600 No reduction expected based on available statistical data  
 Annual load reduction for E. Coli (cfu) 0

**Wet-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.49E+04
Expected runoff coefficient C	0.37
Expected annual capture volume (cf)	1.48E+06
Expected annual loading for Fecal Coliform (MPN)	1.46E+13

Identify preferred BMP Biofiltration

Identify expected effluent Fecal Coliform (cfu/100 mL) 3.49E+04 No reduction expected based on available statistical data  
 Annual load reduction for Fecal Coliform (MPN) 0.00E+00

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	25%	0%	0%	54%	0%	21%	0%	100%
Estimated Area (ac)	17.01	0.00	0.00	35.97	0.00	13.80	0.00	66.78
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	55.2%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)1030 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Elmer Digno Park
Total Tributary Drainage Area (ac)	741.3
Tributary Drainage Area w/in SB County (ac)	741.3
<b>Design Factor</b>	
BMP Footprint (sq.ft)	53492
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	28885.68

**Dry-weather TMDL**  
 Select TMDL, if any Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	74,129.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	3.9673E+12	

**Wet-weather TMDL**  
 Select TMDL, if any Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.15E+04
Expected runoff coefficient C	0.31
Expected annual capture volume (cf)	7.22E+05
Expected annual loading for Fecal Coliform (MPN)	6.43E+12

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	6.43E+12	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	3%	29%	2%	40%	6%	18%	2%	100%
Estimated Area (ac)	22.49	214.15	17.59	298.72	43.57	132.55	12.21	741.29
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	45.8%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	George E. Brown Jr. Park
Total Tributary Drainage Area (ac)	207.3
Tributary Drainage Area w/in SB County (ac)	207.3
<b>Design Factor</b>	
BMP Footprint (sq.ft)	171817
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	185562.36

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	20,730.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point: Away from watershed compliance point\* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-S1  
 Specify subwatershed: Santa Ana River at MWD Crossing\* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 600\* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0\* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 1.10945E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.47E+04
Expected runoff coefficient C	0.36
Expected annual capture volume (cf)	4.64E+06
Expected annual loading for Fecal Coliform (MPN)	4.56E+13

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00\* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 4.56E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	2%	0%	0%	35%	39%	24%	0%	100%
Estimated Area (ac)	3.55	0.00	0.75	72.43	81.80	48.78	0.00	207.30
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	53.7%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	300 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (6590, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Hunters_F
Total Tributary Drainage Area (ac)	151.6
Tributary Drainage Area w/in SB County (ac)	151.6
<b>Design Factor</b>	
BMP Footprint (sq.ft)	8389
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	9060.12

**Dry-weather TMDL**  
 Select TMDL, if any Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	15,164.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	8.1156E+11	

**Wet-weather TMDL**  
 Select TMDL, if any Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.46E+04
Expected runoff coefficient C	0.41
Expected annual capture volume (cf)	2.27E+05
Expected annual loading for Fecal Coliform (MPN)	1.58E+12

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	1.58E+12	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	2%	22%	0%	73%	3%	0%	0%	100%
Estimated Area (ac)	3.32	32.70	0.00	111.02	4.60	0.00	0.00	151.64
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	60.1%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Koehler_F
Total Tributary Drainage Area (ac)	61.6
Tributary Drainage Area w/in SB County (ac)	61.6
<b>Design Factor</b>	
BMP Footprint (sq.ft)	38848
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	41955.84

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	6,162.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	3.29783E+11	

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
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Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.76E+04
Expected runoff coefficient C	0.52
Expected annual capture volume (cf)	1.05E+06
Expected annual loading for Fecal Coliform (MPN)	8.20E+12

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	8.20E+12	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	0%	0%	0%	82%	18%	0%	0%	100%
Estimated Area (ac)	0.27	0.00	0.00	50.50	10.85	0.00	0.00	61.62
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	72.7%

Imperviousness based

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)1030 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Littlefield-Shutis Park
Total Tributary Drainage Area (ac)	99.0
Tributary Drainage Area w/in SB County (ac)	99.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	292270
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	315651.6

**Dry-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	9,900.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow YES

Proximity Compliance point Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID WW-S1  
 Specify subwatershed Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL) 600 \* per Appendix B of Technical Report  
 Identify preferred BMP Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL) 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu) 5,29837E+11

**Wet-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.11E+04
Expected runoff coefficient C	0.43
Expected annual capture volume (cf)	7.89E+06
Expected annual loading for Fecal Coliform (MPN)	6.95E+13

Identify preferred BMP Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL) 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN) 6.95E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	16.2%	0.0%	16.1%	38.4%	19.1%	3.7%	6.6%	100%
Estimated Area (ac)	16.05	0.00	15.92	37.98	18.88	3.62	6.55	99.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	62.6%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	300 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1411200)	6590 (1600, 60600)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1990)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 216140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	McDermott_F
Total Tributary Drainage Area (ac)	1,994.2
Tributary Drainage Area w/in SB County (ac)	1,994.2
<b>Design Factor</b>	
BMP Footprint (sq.ft)	82952
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	89588.16

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	1472.0
Daily dry-weather flow at site (gal/day)	2,935,521.3
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	22.9%
Proximity Compliance point	Away from watershed compliance point
If yes, specify station ID	WW-M5
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona
Identify expected influent E. Coli (cfu/100 mL)	863
Identify preferred BMP	Infiltration Basin
Identify expected effluent E. Coli (cfu/100 mL)	0
Annual load reduction for E. Coli (cfu)	5.16534E+13

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24
Resulting Fecal Coliform influent (MPN/100 mL)	2.36E+04
Expected runoff coefficient C	0.38
Expected annual capture volume (cf)	2.24E+06
Expected annual loading for Fecal Coliform (MPN)	1.50E+13
Identify preferred BMP	Infiltration Basin
Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00
Annual load reduction for Fecal Coliform (MPN)	1.50E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	3%	0%	1%	41%	50%	5%	0%	100%
Estimated Area (ac)	59.84	0.00	23.20	809.40	999.25	99.35	3.21	1,994.24
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	56.1%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Meadowbrook Park
Total Tributary Drainage Area (ac)	889.0
Tributary Drainage Area w/in SB County (ac)	889.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	216958
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	234314.64

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	88,900.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	4.75783E+12	

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.90E+04
Expected runoff coefficient C	0.44
Expected annual capture volume (cf)	5.86E+06
Expected annual loading for Fecal Coliform (MPN)	6.47E+13

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	6.47E+13	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	10.7%	0.0%	16.2%	45.7%	15.7%	11.7%	0.1%	100%
Estimated Area (ac)	94.86	0.00	144.03	405.86	139.30	104.11	0.84	889.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	63.7%

Imperviousness based

BMP Type	Influent/Effluent Summary Statistics for E. coli (#/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

BMP Type	Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	23200 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1411200)	6590 (1600, 6000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1990)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 216140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Nunez Park
Total Tributary Drainage Area (ac)	878.0
Tributary Drainage Area w/in SB County (ac)	878.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	116474
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	125791.92

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	87,800.0
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	YES
Proximity Compliance point	Away from watershed compliance point
If yes, specify station ID	WW-S1
Specify subwatershed	Santa Ana River at MWD Crossing
Identify expected influent E. Coli (cfu/100 mL)	600
Identify preferred BMP	Infiltration Basin
Identify expected effluent E. Coli (cfu/100 mL)	0
Annual load reduction for E. Coli (cfu)	4.69895E+12

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24
Resulting Fecal Coliform influent (MPN/100 mL)	3.86E+04
Expected runoff coefficient C	0.49
Expected annual capture volume (cf)	3.14E+06
Expected annual loading for Fecal Coliform (MPN)	3.44E+13
Identify preferred BMP	Infiltration Basin
Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00
Annual load reduction for Fecal Coliform (MPN)	3.44E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	2.0%	0.0%	7.2%	63.9%	9.7%	14.6%	2.6%	100%
Estimated Area (ac)	17.94	0.00	63.18	560.93	85.52	127.88	22.55	878.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	69.9%

Imperviousness based

BMP Type	Influent/Effluent Summary Statistics for E. coli (#/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

BMP Type	Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	300 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (1600, 36700)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1990)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Oak_F
Total Tributary Drainage Area (ac)	159.4
Tributary Drainage Area w/in SB County (ac)	158.5
<b>Design Factor</b>	
BMP Footprint (sq.ft)	47020
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	50781.6

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	95.0
Daily dry-weather flow at site (gal/day)	15,146.8
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-M5  
 Specify subwatershed: Mill-Cucamonga Creek at Chino-Corona \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 4053 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 5.47587E+12

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.96E+04
Expected runoff coefficient C	0.54
Expected annual capture volume (cf)	1.27E+06
Expected annual loading for Fecal Coliform (MPN)	1.06E+13

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 1.06E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	0%	7%	0%	93%	0%	0%	0%	100%
Estimated Area (ac)	0.00	10.44	0.00	148.46	0.14	0.40	0.00	159.44
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	74.6%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	300 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (1600, 16000)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140)	230 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Perris Hill Park
Total Tributary Drainage Area (ac)	148.0
Tributary Drainage Area w/in SB County (ac)	148.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	85803
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	46333.62

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	14,800.0
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	YES
Proximity Compliance point	Away from watershed compliance point
If yes, specify station ID	WW-S1
Specify subwatershed	Santa Ana River at MWD Crossing
Identify expected influent E. Coli (cfu/100 mL)	600
Identify preferred BMP	Infiltration Basin
Identify expected effluent E. Coli (cfu/100 mL)	0
Annual load reduction for E. Coli (cfu)	7.92079E+11

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24
Resulting Fecal Coliform influent (MPN/100 mL)	6.60E+04
Expected runoff coefficient C	0.34
Expected annual capture volume (cf)	1.16E+06
Expected annual loading for Fecal Coliform (MPN)	2.16E+13
Identify preferred BMP	Infiltration Basin
Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00
Annual load reduction for Fecal Coliform (MPN)	2.16E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	2.9%	0.0%	2.0%	24.2%	0.0%	70.9%	0.0%	100%
Estimated Area (ac)	4.24	0.00	2.96	35.84	0.00	104.96	0.00	148.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	50.0%

Imperviousness based

BMP Type	Influent/Effluent Summary Statistics for E. coli (#/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

BMP Type	Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	NA	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1990 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000 (12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300 (1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000 (2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300 (542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650 (707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 216140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Ranch_O
Total Tributary Drainage Area (ac)	12.2
Tributary Drainage Area w/in SB County (ac)	12.2
<b>Design Factor</b>	
BMP Footprint (sq.ft)	9051
Porosity for Bio-treatment (%)	0.35
Storage Depth for Bio-treatment (ft)	4
BMP Capacity if Biotreatment (cu.ft)	12671.4

**Dry-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	165.0
Daily dry-weather flow at site (gal/day)	2,018.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-M5	
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	868	* per Appendix B of Technical Report
Identify preferred BMP	Biofiltration	

Identify expected effluent E. Coli (cfu/100 mL)	868	No reduction expected based on available statistical data
Annual load reduction for E. Coli (cfu)	0	

**Wet-weather TMDL**

Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
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Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.05E+04
Expected runoff coefficient C	0.58
Expected annual capture volume (cf)	3.17E+05
Expected annual loading for Fecal Coliform (MPN)	2.74E+12

Identify preferred BMP	Biofiltration
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Identify expected effluent Fecal Coliform (cfu/100 mL)	3.05E+04	No reduction expected based on available statistical data
Annual load reduction for Fecal Coliform (MPN)	0.00E+00	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	2%	0%	0%	98%	0%	0%	0%	100%
Estimated Area (ac)	0.29	0.00	0.00	11.94	0.00	0.00	0.00	12.23
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	78.5%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density Residential	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 1811200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)1030 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	SanSevaine_F
Total Tributary Drainage Area (ac)	38.6
Tributary Drainage Area w/in SB County (ac)	38.6
<b>Design Factor</b>	
BMP Footprint (sq.ft)	8348
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	9015.84

**Dry-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	3,861.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point: Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID: WW-S1  
 Specify subwatershed: Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL): 600 \* per Appendix B of Technical Report  
 Identify preferred BMP: Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL): 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu): 2.06636E+11

**Wet-weather TMDL**

Select TMDL, if any: Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.24E+04
Expected runoff coefficient C	0.54
Expected annual capture volume (cf)	2.25E+05
Expected annual loading for Fecal Coliform (MPN)	2.07E+12

Identify preferred BMP: Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL): 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN): 2.07E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	0%	0%	0%	86%	8%	6%	0%	100%
Estimated Area (ac)	0.03	0.00	0.00	33.23	3.09	2.26	0.00	38.61
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	74.4%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Southridge_F
Total Tributary Drainage Area (ac)	18.7
Tributary Drainage Area w/in SB County (ac)	18.7
<b>Design Factor</b>	
BMP Footprint (sq.ft)	41484
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	44802.72

**Dry-weather TMDL**  
 Select TMDL, if any Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	95.0
Daily dry-weather flow at site (gal/day)	1,774.6
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-M5	
Specify subwatershed	Mill-Cucamonga Creek at Chino-Corona	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	4053	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	6.42E+11	

**Wet-weather TMDL**  
 Select TMDL, if any Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.85E+04
Expected runoff coefficient C	0.51
Expected annual capture volume (cf)	1.12E+06
Expected annual loading for Fecal Coliform (MPN)	1.22E+13

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	1.22E+13	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	4%	0%	4%	79%	0%	14%	0%	100%
Estimated Area (ac)	0.76	0.00	0.66	14.68	0.00	2.57	0.00	18.68
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	72.2%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Speicher Park
Total Tributary Drainage Area (ac)	4,373.0
Tributary Drainage Area w/in SB County (ac)	4,373.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	70083
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	75689.64

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	437,300.0
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	YES
Proximity Compliance point	Away from watershed compliance point
If yes, specify station ID	WW-S1
Specify subwatershed	Santa Ana River at MWD Crossing
Identify expected influent E. Coli (cfu/100 mL)	600
Identify preferred BMP	Infiltration Basin
Identify expected effluent E. Coli (cfu/100 mL)	0
Annual load reduction for E. Coli (cfu)	2.34038E+13

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24
Resulting Fecal Coliform influent (MPN/100 mL)	1.75E+04
Expected runoff coefficient C	0.19
Expected annual capture volume (cf)	1.89E+06
Expected annual loading for Fecal Coliform (MPN)	9.39E+12
Identify preferred BMP	Infiltration Basin
Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00
Annual load reduction for Fecal Coliform (MPN)	9.39E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	5.5%	60.0%	1.5%	17.1%	6.8%	7.6%	1.6%	100%
Estimated Area (ac)	238.35	2623.14	63.93	747.61	297.31	333.17	69.49	4,373.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	23.0%

Imperviousness based

BMP Type	Influent/Effluent Summary Statistics for E. coli (#/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

BMP Type	Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	NA	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1990 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000 (12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300 (1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000 (2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300 (542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650 (707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 216140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Strickling_CH
Total Tributary Drainage Area (ac)	100.6
Tributary Drainage Area w/in SB County (ac)	100.6
<b>Design Factor</b>	
BMP Footprint (sq.ft)	33133
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	17891.82

**Dry-weather TMDL**  
 Select TMDL, if any Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	10,058.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-C3	
Specify subwatershed	Prado Park Lake	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	5.38293E+11	

**Wet-weather TMDL**  
 Select TMDL, if any Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	2.67E+04
Expected runoff coefficient C	0.47
Expected annual capture volume (cf)	4.47E+05
Expected annual loading for Fecal Coliform (MPN)	3.38E+12

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	3.38E+12	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	14%	4%	0%	82%	0%	0%	0%	100%
Estimated Area (ac)	13.66	4.35	0.00	82.57	0.00	0.00	0.00	100.58
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	67.7%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	SummitHeights_F
Total Tributary Drainage Area (ac)	40.3
Tributary Drainage Area w/in SB County (ac)	40.3
<b>Design Factor</b>	
BMP Footprint (sq.ft)	36694
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	19814.76

**Dry-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	4,026.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow YES

Proximity Compliance point Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID WW-S1  
 Specify subwatershed Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL) 600 \* per Appendix B of Technical Report  
 Identify preferred BMP Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL) 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu) 2.15467E+11

**Wet-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	3.39E+04
Expected runoff coefficient C	0.59
Expected annual capture volume (cf)	4.95E+05
Expected annual loading for Fecal Coliform (MPN)	4.75E+12

Identify preferred BMP Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL) 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN) 4.75E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	2%	0%	7%	91%	0%	0%	0%	100%
Estimated Area (ac)	0.86	0.00	2.72	36.69	0.00	0.00	0.00	40.26
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	79.3%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Sycamore_F
Total Tributary Drainage Area (ac)	132.8
Tributary Drainage Area w/in SB County (ac)	132.8
<b>Design Factor</b>	
BMP Footprint (sq.ft)	31364
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	33873.12

**Dry-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	623.0
Daily dry-weather flow at site (gal/day)	82,746.9
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 if yes, specify station ID WW-S1  
 Specify subwatershed Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL) 183 \* per Appendix B of Technical Report  
 Identify preferred BMP Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL) 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu) 1.3507E+12

**Wet-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	5.84E+04
Expected runoff coefficient C	0.56
Expected annual capture volume (cf)	8.47E+05
Expected annual loading for Fecal Coliform (MPN)	1.40E+13

Identify preferred BMP Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL) 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN) 1.40E+13

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	0%	0%	65%	8%	25%	1%	1%	100%
Estimated Area (ac)	0.00	0.00	86.76	9.97	32.68	1.51	1.89	132.82
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	76.4%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	890 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	145000	97200	
Bioretention	NA	NA	NA	NA	NA	NA	NA	
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 55000 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 26140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary  
 \*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Vermont Park
Total Tributary Drainage Area (ac)	5,460.0
Tributary Drainage Area w/in SB County (ac)	5,460.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	110544
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	1.2
BMP Capacity if Biotreatment (cu.ft)	119387.52

**Dry-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	546,000.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow YES

Proximity Compliance point Away from watershed compliance point \* Check Figure B-3 of TMDL Technical Report  
 If yes, specify station ID WW-S1  
 Specify subwatershed Santa Ana River at MWD Crossing \* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL) 600 \* per Appendix B of Technical Report  
 Identify preferred BMP Infiltration Basin

Identify expected effluent E. Coli (cfu/100 mL) 0 \* per statistics of International BMP Database  
 Annual load reduction for E. Coli (cfu) 2.92213E+13

**Wet-weather TMDL**

Select TMDL, if any Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306

Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	7.11E+03
Expected runoff coefficient C	0.06
Expected annual capture volume (cf)	2.98E+06
Expected annual loading for Fecal Coliform (MPN)	6.01E+12

Identify preferred BMP Infiltration Basin

Identify expected effluent Fecal Coliform (cfu/100 mL) 0.00E+00 \* per statistics of International BMP Database  
 Annual load reduction for Fecal Coliform (MPN) 6.01E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	2.7%	90.7%	0.0%	0.4%	5.6%	0.5%	0.0%	100%
Estimated Area (ac)	148.81	4952.53	1.12	21.65	308.22	27.67	0.00	5,460.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	3.2%

Imperviousness based

**Influent/Effluent Summary Statistics for E. coli (#/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

**Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)**

BMP Type	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	NA	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1990 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 216140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Yucaipa Equestrian Center
Total Tributary Drainage Area (ac)	5,349.7
Tributary Drainage Area w/in SB County (ac)	4,901.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	243894
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	131702.76

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather

Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	534,969.0
Number of days with dry-weather flow	315

Capture of all daily dry-weather flow	YES
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Proximity Compliance point	Away from watershed compliance point	* Check Figure B-3 of TMDL Technical Report
If yes, specify station ID	WW-S1	
Specify subwatershed	Santa Ana River at MWD Crossing	* Check Figure B-3 of TMDL Technical Report

Identify expected influent E. Coli (cfu/100 mL)	600	* per Appendix B of Technical Report
Identify preferred BMP	Infiltration Basin	

Identify expected effluent E. Coli (cfu/100 mL)	0	* per statistics of International BMP Database
Annual load reduction for E. Coli (cfu)	2.86309E+13	

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather

Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24

Resulting Fecal Coliform influent (MPN/100 mL)	9.48E+03
Expected runoff coefficient C	0.17
Expected annual capture volume (cf)	3.29E+06
Expected annual loading for Fecal Coliform (MPN)	8.84E+12

Identify preferred BMP	Infiltration Basin
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Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00	* per statistics of International BMP Database
Annual load reduction for Fecal Coliform (MPN)	8.84E+12	

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	4.7%	48.7%	0.0%	3.3%	43.0%	0.0%	0.2%	100%
Estimated Area (ac)	253.77	2606.36	0.00	174.88	2301.88	0.54	12.26	5,349.69
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	20.7%

Imperviousness based

BMP Type	Influent/Effluent Summary Statistics for E. coli (#/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

BMP Type	Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200)	300 (300, 39600)	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500)	5000 (2600, 6200)	20300	18500
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200)	6590 (1600, 36700)	36700	20600
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1900)	1030 (500, 1900)	7520	8720
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000)	12 (10, 20)	3000	20
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300)	1890 (200, 3000)	3000	5000
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000)	2750 (1400, 5000)	8080	11000
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300)	542 (200, 625)**	10900	5000
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650)	707 (200, 1160)**	7520	5000
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 21610)	6140 (230, 11800)	25100	20600

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Retrofit Site Characteristics	
Site Name	Yucaipa Valley Golf Club
Total Tributary Drainage Area (ac)	11,956.0
Tributary Drainage Area w/in SB County (ac)	11,956.0
<b>Design Factor</b>	
BMP Footprint (sq.ft)	205469
Porosity for Bio-treatment (%)	0.9
Storage Depth for Bio-treatment (ft)	0.6
BMP Capacity if Biotreatment (cu.ft)	110953.26

Dry-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for dry-weather
Average dry-weather flow (gal/day/ac)	100.0
Daily dry-weather flow at site (gal/day)	1,195,600.0
Number of days with dry-weather flow	315
Capture of all daily dry-weather flow	69.5%
Proximity Compliance point	Away from watershed compliance point
If yes, specify station ID	WW-S1
Specify subwatershed	Santa Ana River at MWD Crossing
Identify expected influent E. Coli (cfu/100 mL)	600
Identify preferred BMP	Infiltration Basin
Identify expected effluent E. Coli (cfu/100 mL)	0
Annual load reduction for E. Coli (cfu)	4.44763E+13

Wet-weather TMDL	
Select TMDL, if any	Middle SAR Bacterial Indicator for wet-weather
Based on continuous hourly rainfall data from 1929 through 2008 (included) at Redlands Met Station #047306	
Average # events/year	25
Average # WQ events/year	20
Average WQ Depth (in.)	0.24
Resulting Fecal Coliform influent (MPN/100 mL)	1.23E+04
Expected runoff coefficient C	0.19
Expected annual capture volume (cf)	2.77E+06
Expected annual loading for Fecal Coliform (MPN)	9.68E+12
Identify preferred BMP	Infiltration Basin
Identify expected effluent Fecal Coliform (cfu/100 mL)	0.00E+00
Annual load reduction for Fecal Coliform (MPN)	9.68E+12

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation	Overall
Distribution (%)	10.1%	52.1%	1.0%	14.4%	21.6%	0.8%	0.1%	100%
Estimated Area (ac)	1202.60	6228.51	114.16	1721.17	2584.81	91.95	12.79	11,956.00
Associated Imperviousness (%)	15.0%	0.0%	90.0%	80.0%	40.0%	40.0%	90.0%	22.9%

Imperviousness based

BMP Type	Influent/Effluent Summary Statistics for E. coli (#/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Bioretention	3, 54	3, 54	42	5	150 (50, 210)	44 (6, 137)	1820	965
Bioswale	5, 39	5, 39	295	1200	990 (200, 5600)	4190 (1200, 5900)	11000	10000
Detention Basin	3, 32	3, 32	398	60	300 (460, 1990)	429 (82, 720)**	12600	1880
Green Roof	1, 6	3, 39	8	5	232 (1, 550)	16 (5, 48)	5	61
Retention Pond	4, 68	4, 69	607	10	800 (1350, 4300)	150 (31, 387)**	17500	800
Wetland Basin	3, 42	3, 42	257	65	785 (363, 1350)	632 (199, 1160)	2510	3580

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero

Land Use	OS/Parks	Undeveloped	Commercial/Industrial	High Density	Medium/Low Density Residential	Institutional	Transportation
Fecal Coliform (MPN/100mL)	6.31E+03	6.31E+03	7.99E+04	3.11E+04	1.18E+04	7.99E+04	1.68E+03

Source: LACDPW, 2008 - SBPAT

BMP Type	Influent/Effluent Summary Statistics for Fecal Coliform (MPN/100 mL)							
	Count of Studies and EMCs		25th Percentile		Median (95% Conf. Interval*)		75th Percentile	
	In	Out	In	Out	In	Out	In	Out
Grass Strip	2, 14	2, 13	2090	2300	32000 (1450, 923200 (300,39600)	NA	145000	97200
Bioretention	NA	NA	NA	NA	NA	NA	NA	NA
Bioswale	10, 79	10, 79	1400	1900	4720 (2120, 5500 (2600, 6200)	20300	18500	
Composite	4, 56	5, 49	4320	2640	13500 (7740, 111200 (6590, 16000)	36700	20600	
Detention Basin	13, 139	14, 170	300	78	1480 (789, 1990 (500, 1900)	7520	8720	
Manufactured Device-D	1, 33	1, 32	300	10	1190 (300, 3000 (12 (10, 20)	3000	20	
Manufactured Device-F	5, 45	5, 48	200	200	478 (200, 1300 (1890 (200, 3000)	3000	5000	
Manufactured Device-P	5, 59	5, 59	500	752	2210 (900, 3000 (2750 (1400, 5000)	8080	11000	
Media Filter	19, 191	20, 185	200	110	1350 (725, 2300 (542 (200, 625)**	10900	5000	
Retention Pond	11, 102	12, 129	150	30	1920 (970, 2650 (707 (200, 1160)**	7520	5000	
Wetland Basin	5, 37	5, 29	3780	230	13000 (5080, 216140 (230, 11800)	25100	20600	

\* Dec 2012 BMP Database Categorical Summary

\*\* for infiltration based system, the effluent concentration should be set to zero



# Appendix C

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# Individual Retrofit Site Cards

BMP Information	
Site ID	011001310
Co-Permittee	City of Ontario
TDA (ac)	12.52
BMP Footprint (ac)	0.10
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Bioretention

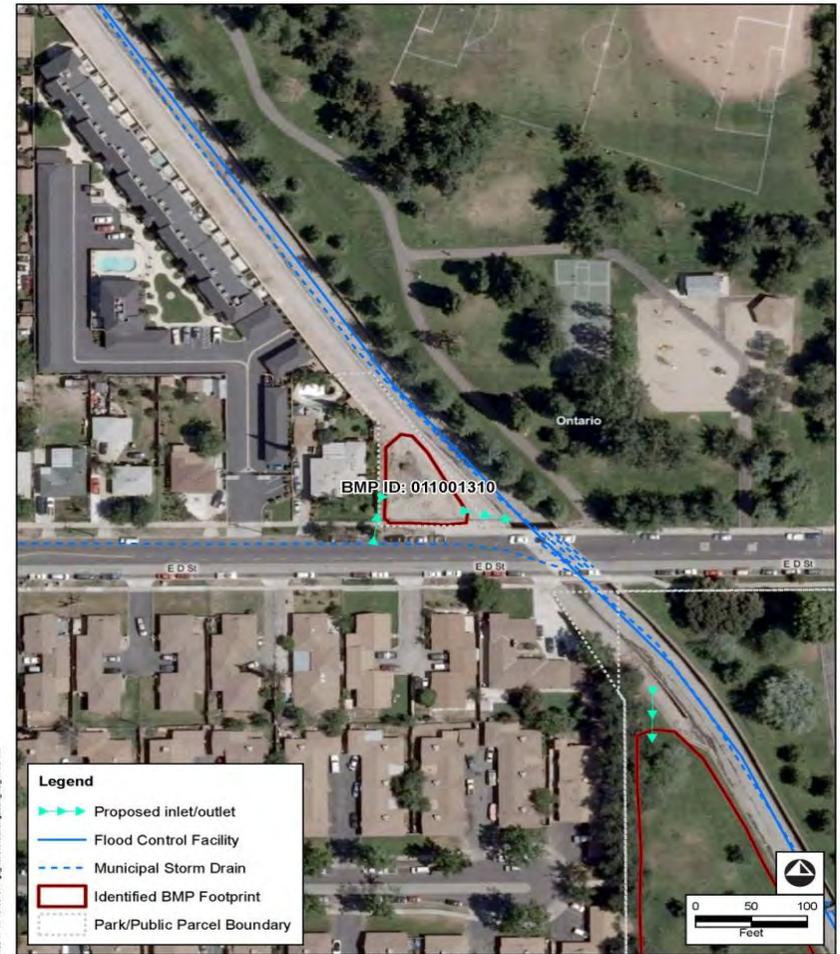
LID Offset	
DCV (ac-ft)	1.65
% of TDA treated	8.9%
Max Offset Impervious Area (ac)	1.11

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	D Street Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	0.24
Area Available of Irrigation (ac)	23.52

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona Road	Mill-Cucamonga Creek at Chino-Corona Road
Total Dry-weather Flow (gal/day)	18429	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.42E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.02E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.36E+12

Hydromodification*	
Existing Imperviousness	78.1%
Max Additional Imp Offset (%)	4.5%
Impervious Surface Area Offset (ac)	0.56

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



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SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1  
City of Ontario

BMP Information	
Site ID	011031112
Co-Permittee	City of Ontario
TDA (ac)	33258.7
BMP Footprint (ac)	4.33
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	4,455
% of TDA treated	0.1%
Max Offset Impervious Area (ac)	34.89

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona Road	Mill-Cucamonga Creek at Chino-Corona Road
Total Dry-weather Flow (gal/day)	4.90E+07	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.17E+14	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.16E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	3.12E+13

Hydromodification*	
Existing Imperviousness	37.0%
Max Additional Imp Offset (%)	1.5%
Impervious Surface Area Offset (ac)	486.4

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF CONSULTING GIS  
 Sources: Caltrans; ESRI; SB DPW; SB Permittees; Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 City of Ontario  
 BMP ID011031112

BMP Information	
Site ID	011347203
Co-Permittee	City of Ontario
TDA (ac)	9234.8
BMP Footprint (ac)	42.7
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Extended Detention Basin with Infiltration

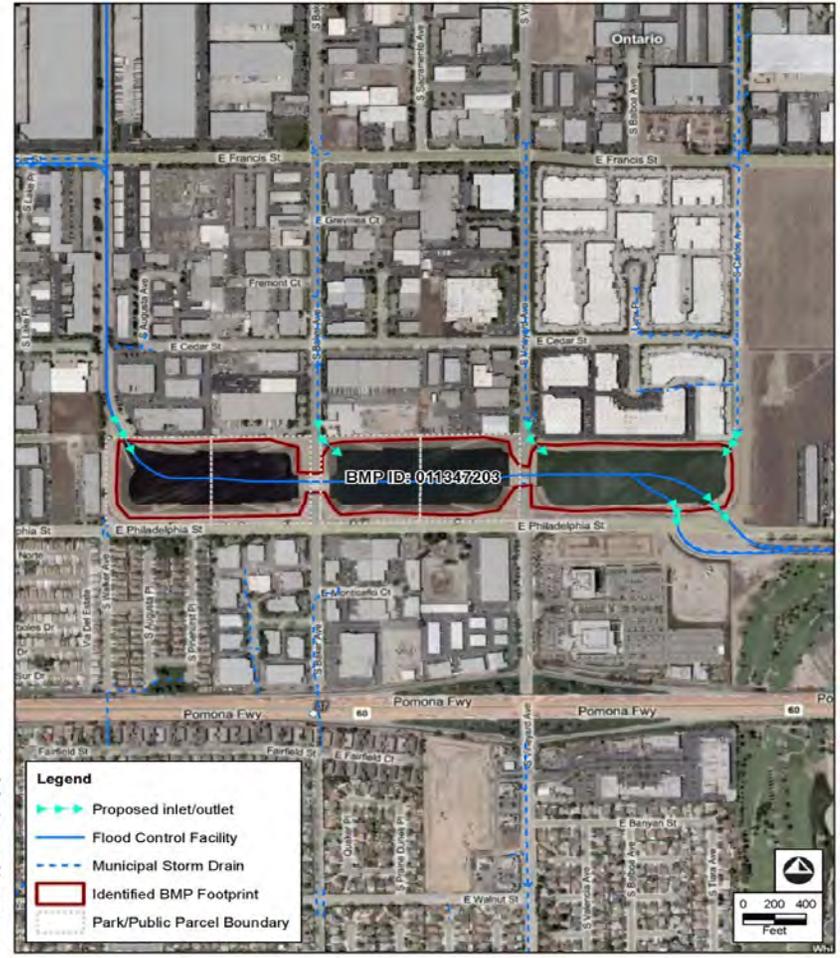
LID Offset	
DCV (ac-ft)	1,189.2
% of TDA treated	3.9%
Max Offset Impervious Area (ac)	358.3

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona Road	Mill-Cucamonga Creek at Chino-Corona Road
Total Dry-weather Flow (gal/day)	1.36E+07	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.05E+15	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	4.13E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	5.88E+14

Hydromodification*	
Existing Imperviousness	71.9%
Max Additional Imp Offset (%)	3.0%
Impervious Surface Area Offset (ac)	272.8

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	012802134
Co-Permittee	City of Rialto
TDA (ac)	3744.6
BMP Footprint (ac)	2.6
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

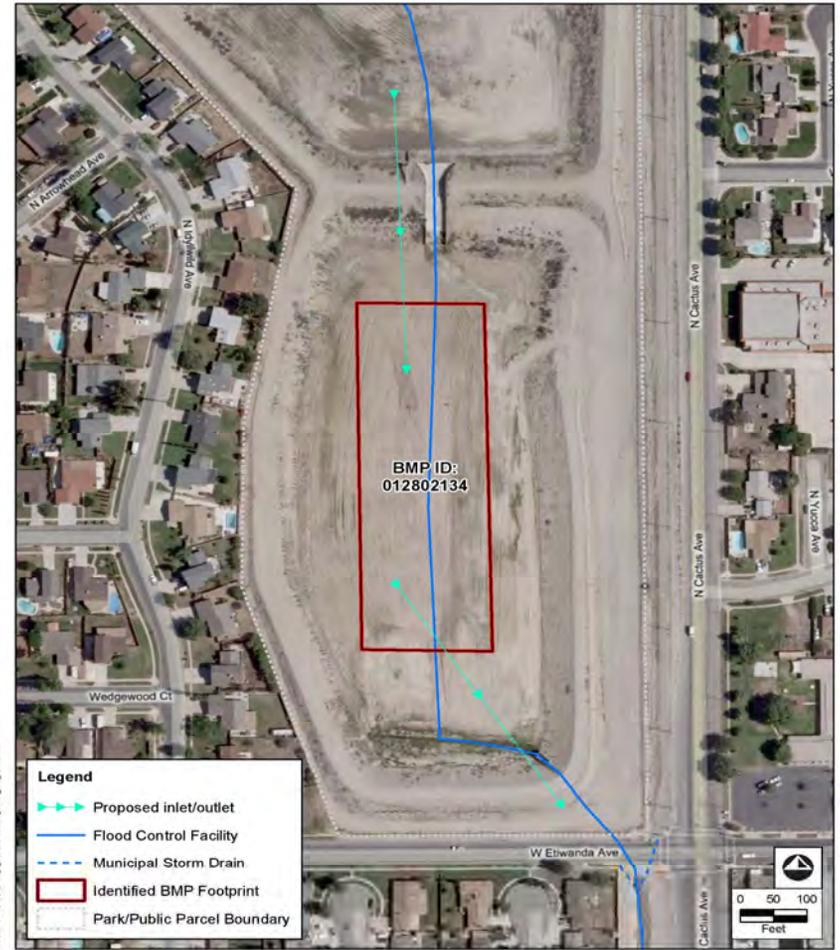
LID Offset	
DCV (ac-ft)	511.3
% of TDA treated	0.5%
Max Offset Impervious Area (ac)	20.2

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	3.75E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.00E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.95E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	2.50E+13

Hydromodification*	
Existing Imperviousness	54.4%
Max Additional Imp Offset (%)	2.3%
Impervious Surface Area Offset (ac)	86.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



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SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 2  
City of Rialto

BMP Information	
Site ID	014125103
Co-Permittee	City of San Bernardino
TDA (ac)	46601.2
BMP Footprint (ac)	4.5
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

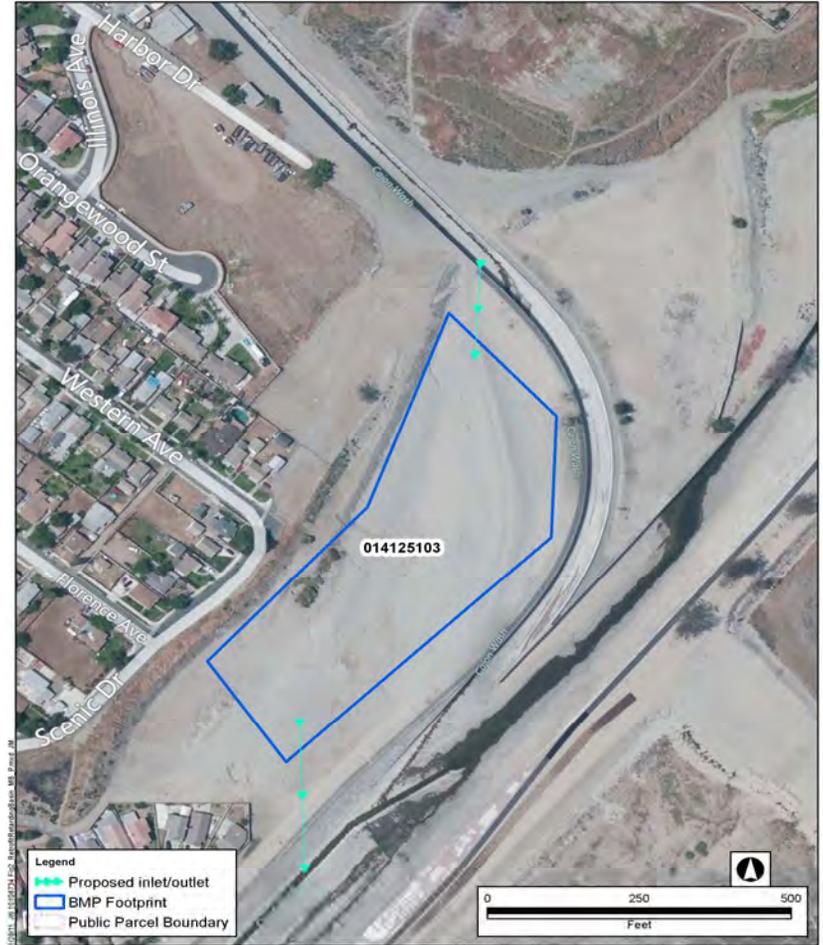
LID Offset	
DCV (ac-ft)	5,054.4
% of TDA treated	0.1%
Max Offset Impervious Area (ac)	45.0

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	4.66E+06	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	8.51E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.37E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	2.06E+13

Hydromodification*	
Existing Imperviousness	16.8%
Max Additional Imp Offset (%)	0.8%
Impervious Surface Area Offset (ac)	353.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	014218106
Co-Permittee	City of San Bernardino
TDA (ac)	705.3
BMP Footprint (ac)	2.6
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	86.7
% of TDA treated	3.3%
Max Offset Impervious Area (ac)	23.3

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	7.05E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	3.77E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.64E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	3.21E+13

Hydromodification*	
Existing Imperviousness	68.6%
Max Additional Imp Offset (%)	3.0%
Impervious Surface Area Offset (ac)	21.0

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	014218110
Co-Permittee	City of San Bernardino
TDA (ac)	969.8
BMP Footprint (ac)	2.5
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	116.1
% of TDA treated	2.3%
Max Offset Impervious Area (ac)	22.5

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	9.70E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	5.19E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.46E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	2.88E+13

Hydromodification*	
Existing Imperviousness	68.2%
Max Additional Imp Offset (%)	2.5%
Impervious Surface Area Offset (ac)	24.0

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	015328131
Co-Permittee	City of San Bernardino
TDA (ac)	11285.8
BMP Footprint (ac)	1.3
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

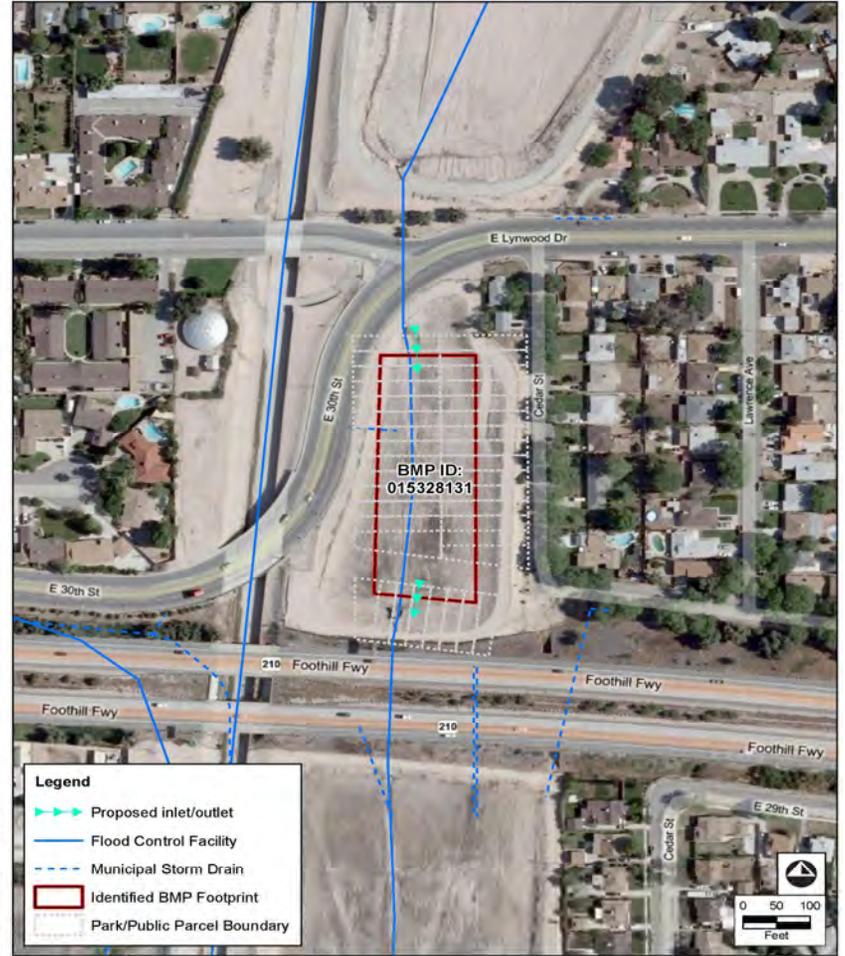
LID Offset	
DCV (ac-ft)	1,480.1
% of TDA treated	0.1%
Max Offset Impervious Area (ac)	11.1

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	1.13E+06	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.54E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	8.21E+03
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	3.69E+12

Hydromodification*	
Existing Imperviousness	6.9%
Max Additional Imp Offset (%)	1.7%
Impervious Surface Area Offset (ac)	196.4

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	016338113
Co-Permittee	City of Colton
TDA (ac)	3974.1
BMP Footprint (ac)	3.3
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Chamber

LID Offset	
DCV (ac-ft)	407.0
% of TDA treated	0.9%
Max Offset Impervious Area (ac)	35.1

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	8.74E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	4.68E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.62E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	4.68E+13

Hydromodification*	
Existing Imperviousness	29.6%
Max Additional Imp Offset (%)	27.7%
Impervious Surface Area Offset (ac)	2,422.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	020118315
Co-Permittee	City of Rancho Cucamonga
TDA (ac)	1,477.2
BMP Footprint (ac)	30.8
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	221.5
% of TDA treated	15.0%
Max Offset Impervious Area (ac)	222.1

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona	Mill-Cucamonga Creek at Chino-Corona
Total Dry-weather Flow (gal/day)	2.17E+06	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.67E+14	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.61E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	2.68E+14

Hydromodification*	
Existing Imperviousness	52.5%
Max Additional Imp Offset (%)	8.9%
Impervious Surface Area Offset (ac)	131.7

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	020199114
Co-Permittee	City of Rancho Cucamonga
TDA (ac)	1,058
BMP Footprint (ac)	13.3
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	159.6
% of TDA treated	9.0%
Max Offset Impervious Area (ac)	95.6

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona	Mill-Cucamonga Creek at Chino-Corona
Total Dry-weather Flow (gal/day)	1.56E+06	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.20E+14	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.14E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	9.52E+13

Hydromodification*	
Existing Imperviousness	50.6%
Max Additional Imp Offset (%)	6.5%
Impervious Surface Area Offset (ac)	68.8

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1

BMP Information	
Site ID	021018145
Co-Permittee	City of Ontario
TDA (ac)	11,844.6
BMP Footprint (ac)	18.5
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

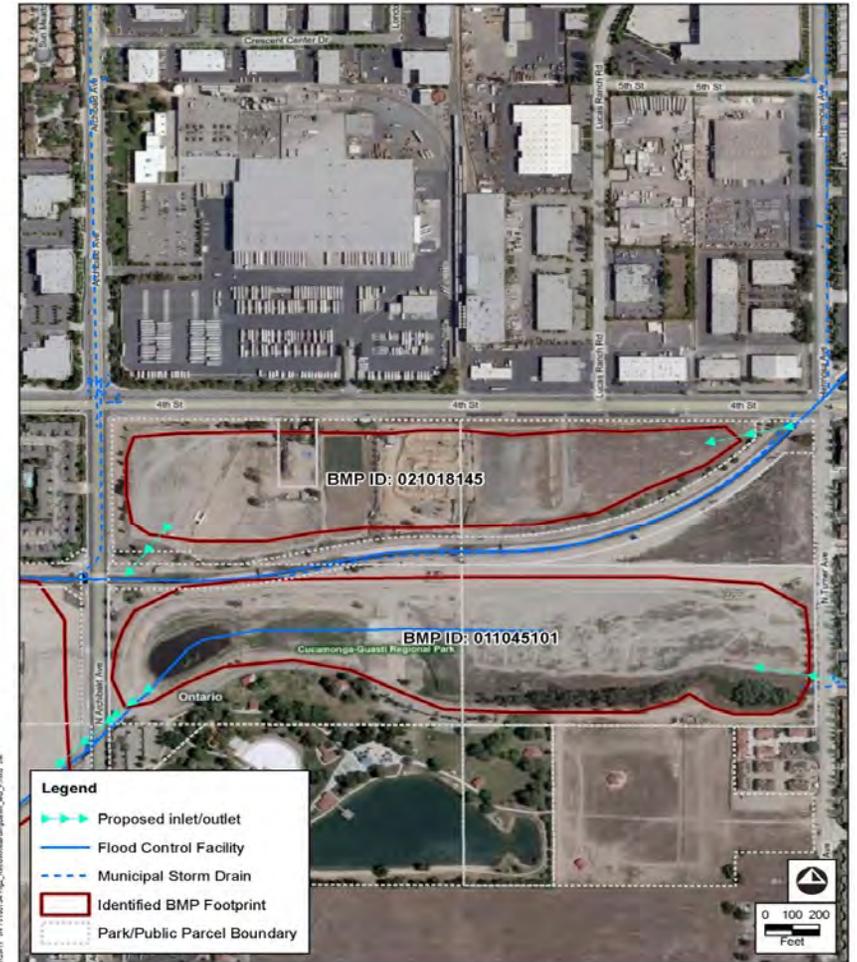
LID Offset	
DCV (ac-ft)	1,548.3
% of TDA treated	1.3%
Max Offset Impervious Area (ac)	152.8

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Cucamonga-Guasti Regional Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	41.6
Area Available of Irrigation (ac)	4,163.9

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona	Mill-Cucamonga Creek at Chino-Corona
Total Dry-weather Flow (gal/day)	1.74E+07	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	5.02E+14	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.59E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	2.60E+14

Hydromodification*	
Existing Imperviousness	43.2%
Max Additional Imp Offset (%)	2.2%
Impervious Surface Area Offset (ac)	258.8

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 City of Ontario  
 BMP ID021018145

BMP Information	
Site ID	021813101
Co-Permittee	City of Ontario
TDA (ac)	47,319
BMP Footprint (ac)	67.7
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	5,878.6
% of TDA treated	1.2%
Max Offset Impervious Area (ac)	588.4

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona	Mill-Cucamonga Creek at Chino-Corona
Total Dry-weather Flow (gal/day)	6.97E+07	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.84E+15	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.47E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	5.57E+14

Hydromodification*	
Existing Imperviousness	46.4%
Max Additional Imp Offset (%)	2.2%
Impervious Surface Area Offset (ac)	1,015.3

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1

BMP Information	
Site ID	021830106
Co-Permittee	City of Chino
TDA (ac)	57,224
BMP Footprint (ac)	4.9
Soil Type	C
Feasibility of Infiltration?	No
BMP Type	Extended Detention Basin

LID Offset	
DCV (ac-ft)	6,824.8
% of TDA treated	-
Max Offset Impervious Area (ac)	-

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Agricultural Field
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	11.1
Area Available of Irrigation (ac)	1,108.7

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona	Mill-Cucamonga Creek at Chino-Corona
Total Dry-weather Flow (gal/day)	8.43E+07	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	429	n/a
Annual load reduction E. Coli (cfu/yr)	2.24E+14	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.50E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	1.85E+04
Annual load reduction Fecal Coliform (MPN)	n/a	3.53E+13

Hydromodification*	
Existing Imperviousness	46.3%
Max Additional Imp Offset (%)	1.1%
Impervious Surface Area Offset (ac)	653.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



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BMP Information	
Site ID	022707113
Co-Permittee	City of Rancho Cucamonga
TDA (ac)	988.7
BMP Footprint (ac)	24.3
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	129.0
% of TDA treated	20.3%
Max Offset Impervious Area (ac)	200.8

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Etiwanda High School
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	54.6
Area Available of Irrigation (ac)	5,461.4

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at Pedley Crossing	Santa Ana River at Pedley Crossing
Total Dry-weather Flow (gal/day)	1.21E+05	n/a
Influent E. Coli (cfu/100mL)	577	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	6.21E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.46E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.99E+14

Hydromodification*	
Existing Imperviousness	53.1%
Max Additional Imp Offset (%)	9.6%
Impervious Surface Area Offset (ac)	94.5

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 City of Rancho Cucamonga  
 BMP ID022707113

BMP Information	
Site ID	022928370
Co-Permittee	City of Rancho Cucamonga
TDA (ac)	341.7
BMP Footprint (ac)	8.5
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

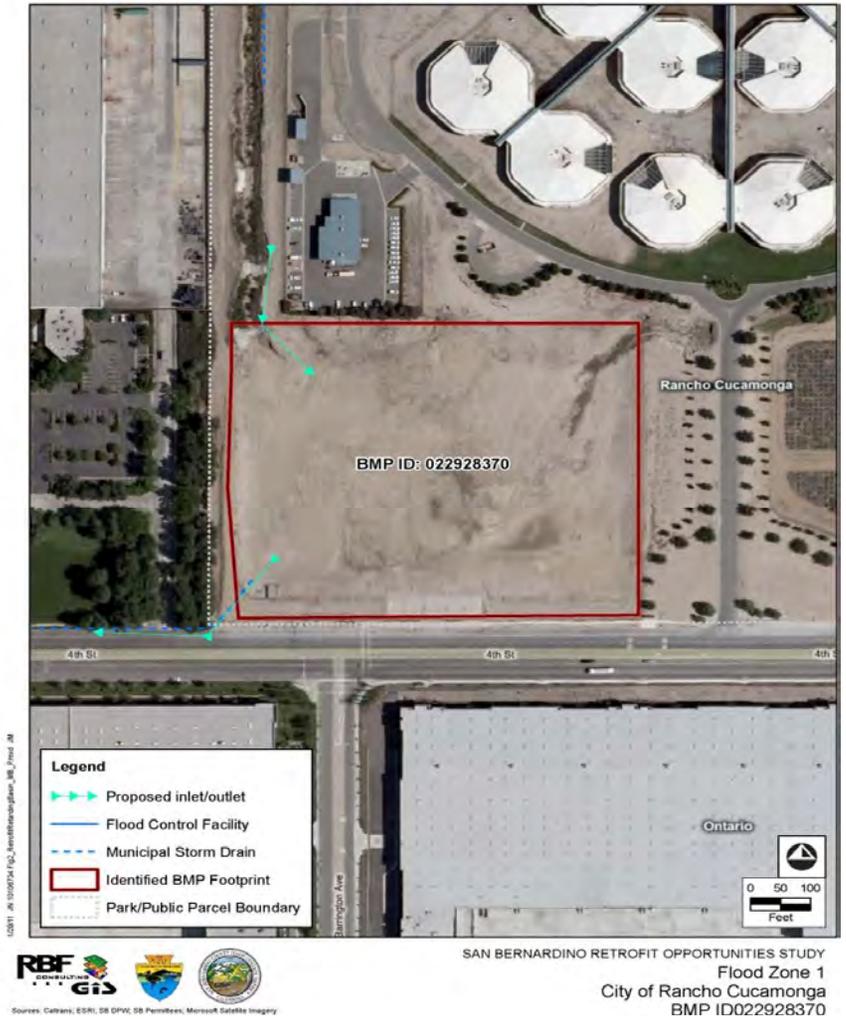
LID Offset	
DCV (ac-ft)	38.9
% of TDA treated	23.7%
Max Offset Impervious Area (ac)	80.9

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at Pedley Crossing	Santa Ana River at Pedley Crossing
Total Dry-weather Flow (gal/day)	4.17E+04	n/a
Influent E. Coli (cfu/100mL)	577	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.15E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	5.86E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	1.66E+14

Hydromodification*	
Existing Imperviousness	64.3%
Max Additional Imp Offset (%)	11.2%
Impervious Surface Area Offset (ac)	38.4

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	022929109
Co-Permittee	Unincorporated
TDA (ac)	3,212.9
BMP Footprint (ac)	14.8
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	363.8
% of TDA treated	4.4%
Max Offset Impervious Area (ac)	140.9

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona	Mill-Cucamonga Creek at Chino-Corona
Total Dry-weather Flow (gal/day)	3.05E+05	n/a
Influent E. Coli (cfu/100mL)	4083	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.10E+14	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.87E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.41E+14

Hydromodification*	
Existing Imperviousness	57.0%
Max Additional Imp Offset (%)	3.3%
Impervious Surface Area Offset (ac)	105.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF CONSULTING GIS  
Sources: Caltrans; ESRI; SB DPW; SB Permittees; Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1  
Unincorporated  
BMP ID022929109

BMP Information	
Site ID	023010202
Co-Permittee	Unincorporated
TDA (ac)	2,930.1
BMP Footprint (ac)	8.8
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	337.4
% of TDA treated	2.8%
Max Offset Impervious Area (ac)	82.6

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona	Mill-Cucamonga Creek at Chino-Corona
Total Dry-weather Flow (gal/day)	2.78E+05	n/a
Influent E. Coli (cfu/100mL)	4053	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.01E+14	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.14E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	9.21E+13

Hydromodification*	
Existing Imperviousness	59.6%
Max Additional Imp Offset (%)	2.5%
Impervious Surface Area Offset (ac)	72.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF CONSULTING GIS  
 Sources: Caltrans, ESRI, SB DPW, SB Permittees, Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 Unincorporated  
 BMP ID023010202

BMP Information	
Site ID	023803129
Co-Permittee	Unincorporated
TDA (ac)	28,130.6
BMP Footprint (ac)	1.9
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

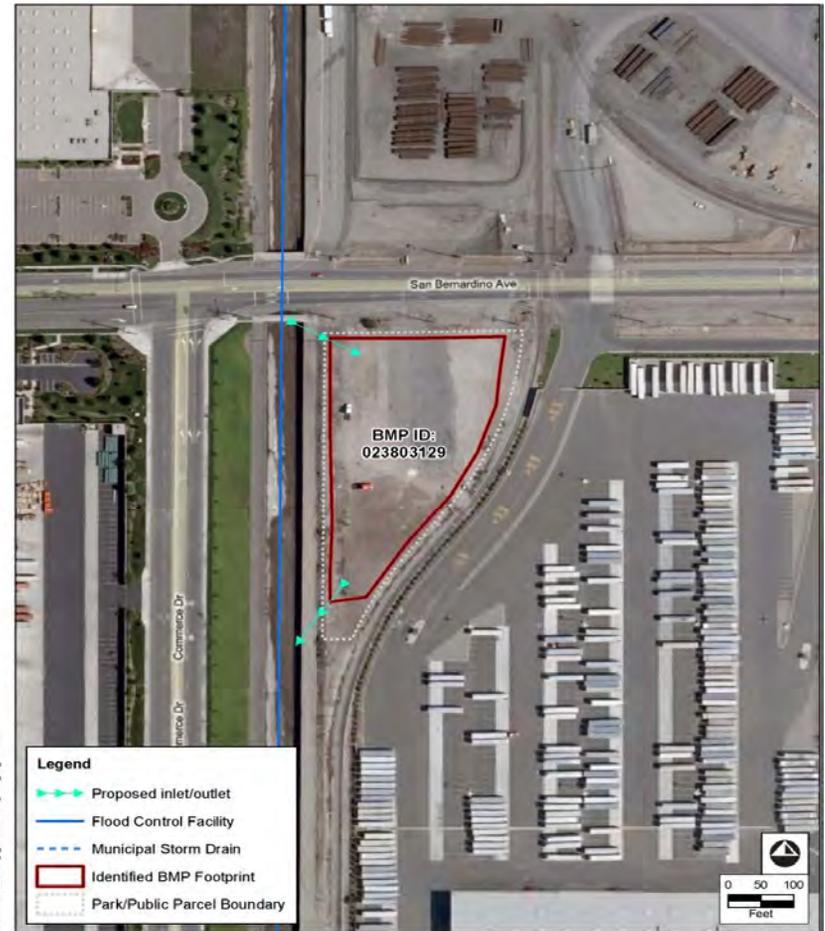
LID Offset	
DCV (ac-ft)	3,130.1
% of TDA treated	0.1%
Max Offset Impervious Area (ac)	18.6

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona	Mill-Cucamonga Creek at Chino-Corona
Total Dry-weather Flow (gal/day)	2.67E+06	n/a
Influent E. Coli (cfu/100mL)	4053	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.44E+14	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.89E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	1.21E+13

Hydromodification*	
Existing Imperviousness	34.5%
Max Additional Imp Offset (%)	0.8%
Impervious Surface Area Offset (ac)	219.3

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 Unincorporated  
 BMP ID023803129

BMP Information	
Site ID	023809104
Co-Permittee	City of Fontana
TDA (ac)	329.9
BMP Footprint (ac)	62.0
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	37.0
% of TDA treated	100.0%
Max Offset Impervious Area (ac)	329.9

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona	Mill-Cucamonga Creek at Chino-Corona
Total Dry-weather Flow (gal/day)	3.13E+04	n/a
Influent E. Coli (cfu/100mL)	4053	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.13E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	5.69E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.18E+15

Hydromodification*	
Existing Imperviousness	73.4%
Max Additional Imp Offset (%)	26.6%
Impervious Surface Area Offset (ac)	87.8

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



Sources: Caltrans; ESRI; SB DPW; SB Permittee; Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 City of Fontana  
 BMP ID023809104

BMP Information	
Site ID	023812103
Co-Permittee	City of Ontario
TDA (ac)	14,204.6
BMP Footprint (ac)	62.8
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

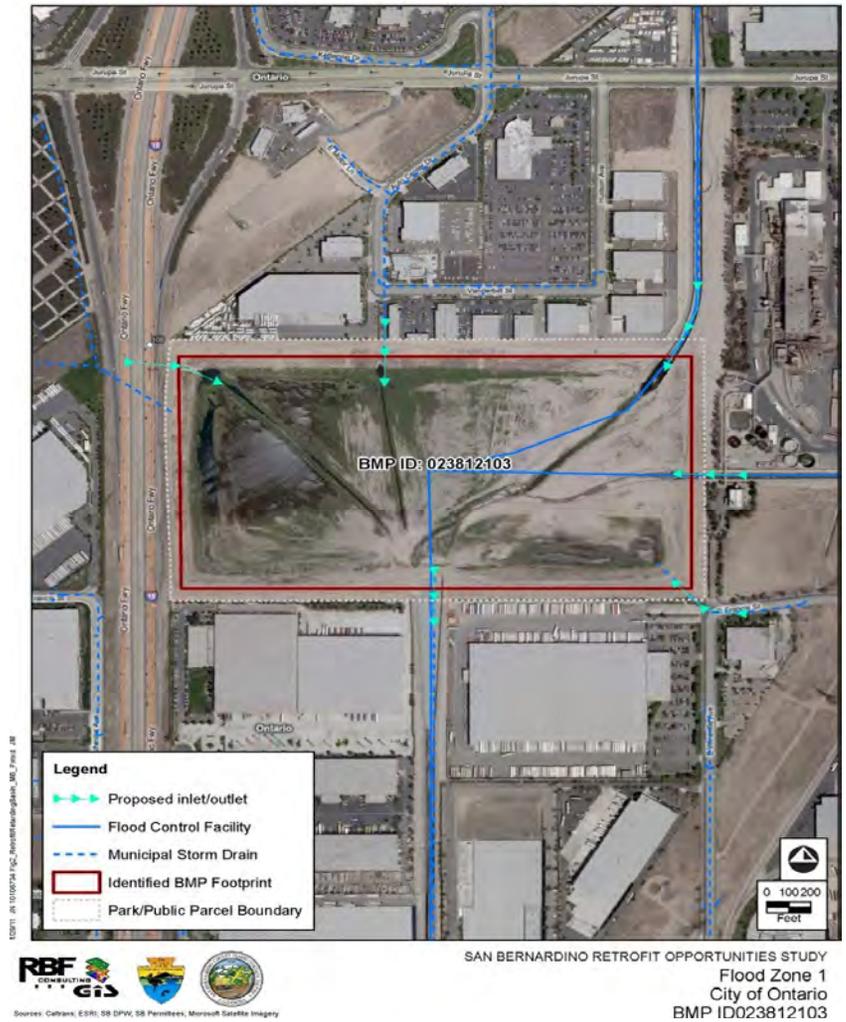
LID Offset	
DCV (ac-ft)	1,648.1
% of TDA treated	4.1%
Max Offset Impervious Area (ac)	584.9

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona	Mill-Cucamonga Creek at Chino-Corona
Total Dry-weather Flow (gal/day)	2.34E+06	n/a
Influent E. Coli (cfu/100mL)	868	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.81E+14	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.39E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	7.10E+14

Hydromodification*	
Existing Imperviousness	44.9%
Max Additional Imp Offset (%)	4.3%
Impervious Surface Area Offset (ac)	609.4

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	024907103
Co-Permittee	City of Rialto
TDA (ac)	3,908.7
BMP Footprint (ac)	2.5
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	495.7
% of TDA treated	0.6%
Max Offset Impervious Area (ac)	21.6

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	3.91E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.09E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.83E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	2.39E+13

Hydromodification*	
Existing Imperviousness	66.6%
Max Additional Imp Offset (%)	1.5%
Impervious Surface Area Offset (ac)	60.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of Rialto  
 BMP ID024907103

BMP Information	
Site ID	025408111
Co-Permittee	City of Colton
TDA (ac)	1,280.1
BMP Footprint (ac)	4.7
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	146.9
% of TDA treated	3.5%
Max Offset Impervious Area (ac)	44.7

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Hermosa Cemetery
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	10.7
Area Available of Irrigation (ac)	1,067.8

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	1.28E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	6.85E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.94E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	6.22E+13

Hydromodification*	
Existing Imperviousness	65.3%
Max Additional Imp Offset (%)	2.9%
Impervious Surface Area Offset (ac)	37.4

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF CONSULTING GIS  
 Sources: Caltrans; ESRI; DPW; SR Permittees; Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of Colton  
 BMP ID025408111

BMP Information	
Site ID	026006118
Co-Permittee	City of Colton
TDA (ac)	90.6
BMP Footprint (ac)	1.9
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	9.6
% of TDA treated	21.6%
Max Offset Impervious Area (ac)	19.5

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Agua Mansa Cemetery
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	4.3
Area Available of Irrigation (ac)	431.6

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	9.06E+03	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	4.85E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.68E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.07E+13

Hydromodification*	
Existing Imperviousness	41.4%
Max Additional Imp Offset (%)	18.5%
Impervious Surface Area Offset (ac)	16.7

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	026203115
Co-Permittee	Unincorporated
TDA (ac)	390.9
BMP Footprint (ac)	13.7
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	3.91E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.09E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	7.31E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	3.34E+14

LID Offset	
DCV (ac-ft)	66.9
% of TDA treated	22.2%
Max Offset Impervious Area (ac)	86.7

Hydromodification*	
Existing Imperviousness	36.3%
Max Additional Imp Offset (%)	17.1%
Impervious Surface Area Offset (ac)	66.9

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-



RBF  
GIS  
Sources: Caltrans, ESRI, SB OPV, SB Permites, Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 2  
Unincorporated  
BMP ID026203115

BMP Information	
Site ID	026421317
Co-Permittee	City of Rialto
TDA (ac)	3,396.0
BMP Footprint (ac)	4.0
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	479.9
% of TDA treated	0.9%
Max Offset Impervious Area (ac)	30.5

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Jerry Eaves Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	9.0
Area Available of Irrigation (ac)	898.8

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	3.40E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.82E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.99E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	3.98E+13

Hydromodification*	
Existing Imperviousness	53.6%
Max Additional Imp Offset (%)	1.7%
Impervious Surface Area Offset (ac)	58.9

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF  
GIS  
Sources: Caltrans, ESRI, SB DPV, SB Permittees, Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 2  
City of Rialto  
BMP ID026421317

BMP Information	
Site ID	026528108
Co-Permittee	City of San Bernardino
TDA (ac)	3,421.8
BMP Footprint (ac)	10.7
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	502.0
% of TDA treated	2.3%
Max Offset Impervious Area (ac)	78.6

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	3.42E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.83E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.57E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	9.13E+13

Hydromodification*	
Existing Imperviousness	32.8%
Max Additional Imp Offset (%)	3.7%
Impervious Surface Area Offset (ac)	124.9

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of San Bernardino  
 BMP ID026528108

BMP Information	
Site ID	026607209
Co-Permittee	City of San Bernardino
TDA (ac)	768.0
BMP Footprint (ac)	3.6
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	112.8
% of TDA treated	3.5%
Max Offset Impervious Area (ac)	26.6

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	7.68E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	4.11E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	4.65E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	5.61E+13

Hydromodification*	
Existing Imperviousness	74.6%
Max Additional Imp Offset (%)	3.2%
Impervious Surface Area Offset (ac)	24.7

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	027214142
Co-Permittee	City of San Bernardino
TDA (ac)	2,914.0
BMP Footprint (ac)	2.4
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	368.3
% of TDA treated	0.4%
Max Offset Impervious Area (ac)	10.3

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	2.91E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.56E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.42E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	5.69E+12

Hydromodification*	
Existing Imperviousness	21.1%
Max Additional Imp Offset (%)	2.2%
Impervious Surface Area Offset (ac)	65.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



Source: Caltrans, EERI, SB DPW, SB Permittees, Microsoft Google Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of San Bernardino  
 BMP ID027214142

BMP Information	
Site ID	027932160
Co-Permittee	City of San Bernardino
TDA (ac)	31,199.9
BMP Footprint (ac)	8.5
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

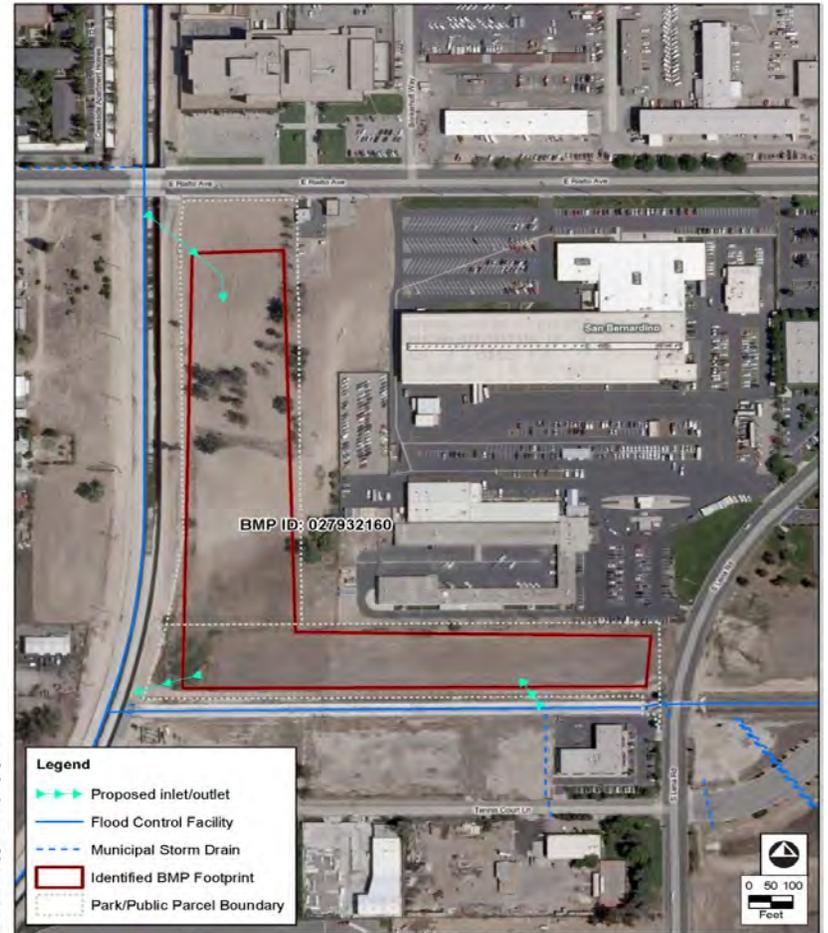
LID Offset	
DCV (ac-ft)	3,539.0
% of TDA treated	0.1%
Max Offset Impervious Area (ac)	40.4

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	3.12E+06	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	8.00E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.93E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	2.73E+13

Hydromodification*	
Existing Imperviousness	30.2%
Max Additional Imp Offset (%)	1.2%
Impervious Surface Area Offset (ac)	365.5

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of San Bernardino  
 BMP ID027932160

BMP Information	
Site ID	028574212
Co-Permittee	City of Highland
TDA (ac)	3,065.6
BMP Footprint (ac)	2.6
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	378.9
% of TDA treated	0.8%
Max Offset Impervious Area (ac)	23.0

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	3.07E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.64E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.31E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.15E+13

Hydromodification*	
Existing Imperviousness	11.8%
Max Additional Imp Offset (%)	2.7%
Impervious Surface Area Offset (ac)	81.5

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF CONSULTING GIS  
Sources: Caltrans; ESRI; SB DPW; SB Permittees; Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 2  
City of Highland  
BMP ID028574212

BMP Information	
Site ID	030113274
Co-Permittee	City of Yucaipa
TDA (ac)	990.9
BMP Footprint (ac)	1.6
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	9.91E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	5.30E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.08E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	5.68E+12

LID Offset	
DCV (ac-ft)	110.5
% of TDA treated	0.8%
Max Offset Impervious Area (ac)	7.9

Hydromodification*	
Existing Imperviousness	22.9%
Max Additional Imp Offset (%)	2.1%
Impervious Surface Area Offset (ac)	21.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 3  
 City of Yucaipa  
 BMP ID030113274

BMP Information	
Site ID	030312104
Co-Permittee	City of Yucaipa
TDA (ac)	3,287.6
BMP Footprint (ac)	10.7
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

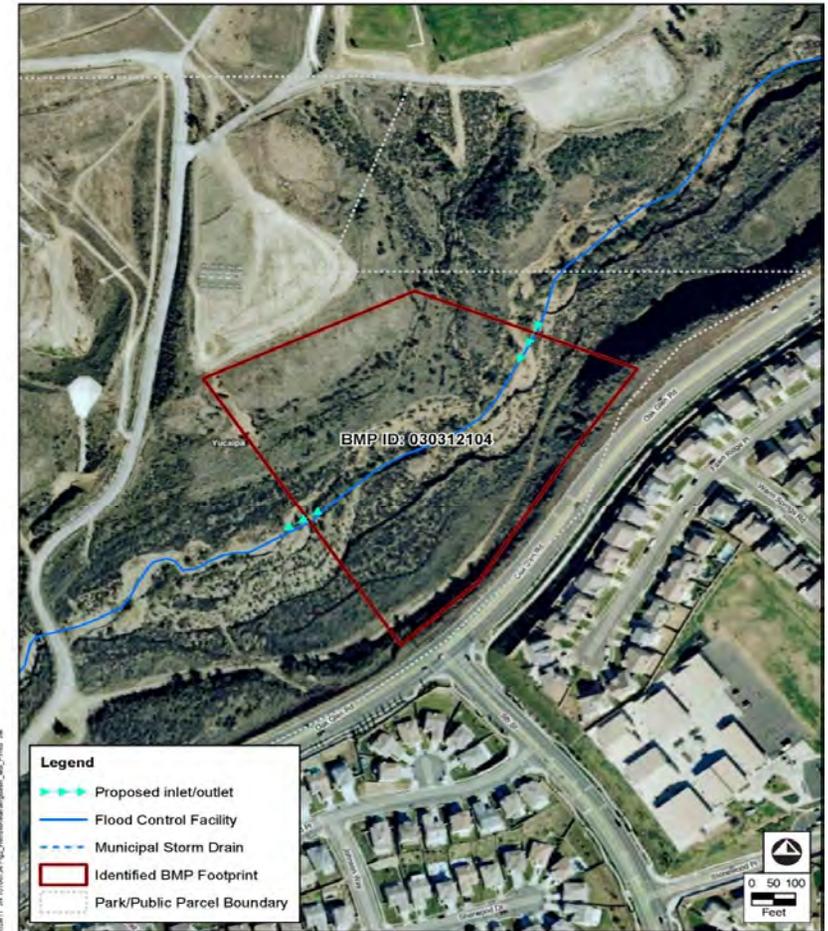
LID Offset	
DCV (ac-ft)	405.6
% of TDA treated	2.8%
Max Offset Impervious Area (ac)	93.4

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	3.29E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.76E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.34E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	4.77E+13

Hydromodification*	
Existing Imperviousness	26.2%
Max Additional Imp Offset (%)	4.0%
Impervious Surface Area Offset (ac)	131.7

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF CONSULTING GIS  
 Sources: Caltrans; ESRI; SB DPW; SB Permittees; Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 3  
 City of Yucaipa  
 BMP ID030312104

BMP Information	
Site ID	030905101
Co-Permittee	City of Big Bear
TDA (ac)	189.3
BMP Footprint (ac)	2.2
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Biofiltration

TMDLs	
TMDL	Big Bear Nutrient for dry hydrological conditions
TP Waste Load Allocation (lbs/yr)	475
TP loading at retrofit site (lbs/yr)	12.07
TP removal at retrofit site (lbs/yr)	None expected

Hydromodification*	
Existing Imperviousness	59.4%
Max Additional Imp Offset (%)	-
Impervious Surface Area Offset (ac)	-

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.

LID Offset	
DCV (ac-ft)	33
% of TDA treated	9.4%
Max Offset Impervious Area (ac)	18

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Meadow Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	4.9
Area Available of Irrigation (ac)	489.1



BMP Information	
Site ID	101326117
Co-Permittee	Unincorporated
TDA (ac)	20,700.3
BMP Footprint (ac)	0.4
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Chamber

LID Offset	
DCV (ac-ft)	2,679.0
% of TDA treated	0.0%
Max Offset Impervious Area (ac)	3.3

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Chino Creek at Central Ave	Chino Creek at Central Ave
Total Dry-weather Flow (gal/day)	7.71E+07	n/a
Influent E. Coli (cfu/100mL)	139	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.71E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.05E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	2.66E+12

Hydromodification*	
Existing Imperviousness	28.4%
Max Additional Imp Offset (%)	17.1%
Impervious Surface Area Offset (ac)	5,495.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 Unincorporated  
 BMP ID101326117

BMP Information	
Site ID	102337170
Co-Permittee	City of Chino Hills
TDA (ac)	17.0
BMP Footprint (ac)	0.4
Soil Type	C
Feasibility of Infiltration?	No
BMP Type	Biofiltration

LID Offset	
DCV (ac-ft)	2.2
% of TDA treated	25.8%
Max Offset Impervious Area (ac)	4

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Skyview Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	0.9
Area Available of Irrigation (ac)	90.4

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Chino Creek at Central Ave	Chino Creek at Central Ave
Total Dry-weather Flow (gal/day)	1.54E+03	n/a
Influent E. Coli (cfu/100mL)	412	n/a
Expected Effluent E. Coli (cfu/100mL)	412	n/a
Annual load reduction E. Coli (cfu/yr)	0.00E+00	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.11E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	2.32E+04
Annual load reduction Fecal Coliform (MPN)	n/a	1.36E+12

Hydromodification*	
Existing Imperviousness	79.9%
Max Additional Imp Offset (%)	-
Impervious Surface Area Offset (ac)	-

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	103226113
Co-Permittee	City of Chino Hills
TDA (ac)	1,193.7
BMP Footprint (ac)	0.5
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	151.9
% of TDA treated	0.2%
Max Offset Impervious Area (ac)	2.3

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Chino Creek at Central Ave	Chino Creek at Central Ave
Total Dry-weather Flow (gal/day)	2.86E+06	n/a
Influent E. Coli (cfu/100mL)	139	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.17E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.78E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.59E+12

Hydromodification*	
Existing Imperviousness	33.8%
Max Additional Imp Offset (%)	3.2%
Impervious Surface Area Offset (ac)	38.3

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF CONSULTING GIS  
Sources: Caltrans, ESRI, SB DPW, SB Permittees, Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1  
City of Chino Hills  
BMP ID103226113

BMP Information	
Site ID	103260142
Co-Permittee	City of Chino Hills
TDA (ac)	738.5
BMP Footprint (ac)	0.4
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Bioretention

LID Offset	
DCV (ac-ft)	94.0
% of TDA treated	0.6%
Max Offset Impervious Area (ac)	4.4

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Crossroad Parks
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	0.9
Area Available of Irrigation (ac)	90.7

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Chino Creek at Central Ave	Chino Creek at Central Ave
Total Dry-weather Flow (gal/day)	1.77E+06	n/a
Influent E. Coli (cfu/100mL)	139	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.28E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.98E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	3.45E+12

Hydromodification*	
Existing Imperviousness	37.6%
Max Additional Imp Offset (%)	3.7%
Impervious Surface Area Offset (ac)	27.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	103309117
Co-Permittee	City of Chino Hills
TDA (ac)	137.1
BMP Footprint (ac)	1.9
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Prado Park Lake	Prado Park Lake
Total Dry-weather Flow (gal/day)	1.37E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	7.34E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.73E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.74E+13

LID Offset	
DCV (ac-ft)	16.6
% of TDA treated	6.3%
Max Offset Impervious Area (ft <sup>2</sup> )	8.6

Hydromodification*	
Existing Imperviousness	67.2%
Max Additional Imp Offset (%)	5.7%
Impervious Surface Area Offset (ac)	7.8

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Meadows Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	4.3
Area Available of Irrigation (ac)	431.9



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 City of Chino Hills  
 BMP ID103309117

BMP Information	
Site ID	104712102
Co-Permittee	City of Upland
TDA (ac)	4,212.5
BMP Footprint (ac)	30.5
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	557
% of TDA treated	5.9%
Max Offset Impervious Area (ac)	248.9

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona Rd	Mill-Cucamonga Creek at Chino-Corona Rd
Total Dry-weather Flow (gal/day)	6.20E+06	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	4.77E+14	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.66E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	3.71E+14

Hydromodification*	
Existing Imperviousness	69.9%
Max Additional Imp Offset (%)	3.9%
Impervious Surface Area Offset (ac)	162.7

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF  
GIS  
Sources: Caltrans; ESRI; SD DPW; SD Permittees; Microsoft Google Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1  
City of Upland  
BMP ID104712102

BMP Information	
Site ID	104745104
Co-Permittee	City of Ontario
TDA (ac)	4,428.6
BMP Footprint (ac)	1.9
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	584.6
% of TDA treated	0.4%
Max Offset Impervious Area (ac)	15.5

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona Rd	Mill-Cucamonga Creek at Chino-Corona Rd
Total Dry-weather Flow (gal/day)	6.52E+06	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	5.15E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.65E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	2.31E+13

Hydromodification*	
Existing Imperviousness	69.6%
Max Additional Imp Offset (%)	1.6%
Impervious Surface Area Offset (ac)	72.6

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 City of Ontario  
 BMP ID104745104

BMP Information	
Site ID	105029126
Co-Permittee	City of Ontario
TDA (ac)	324.8
BMP Footprint (ac)	0.5
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	42.3
% of TDA treated	1.3%
Max Offset Impervious Area (ft <sup>2</sup> )	4.1

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona Rd	Mill-Cucamonga Creek at Chino-Corona Rd
Total Dry-weather Flow (gal/day)	4.78E+05	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.74E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.09E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	6.61E+12

Hydromodification*	
Existing Imperviousness	72.8%
Max Additional Imp Offset (%)	1.9%
Impervious Surface Area Offset (ac)	6.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF  
GIS  
Sources: Caltrans, ESRI, SB DPW, SB Permitters, Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1  
City of Ontario  
BMP ID105029126

BMP Information	
Site ID	105216106
Co-Permittee	City of Ontario
TDA (ac)	1,063.4
BMP Footprint (ac)	17.5
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Prado Park Lake	Prado Park Lake
Total Dry-weather Flow (gal/day)	1.06E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	5.69E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	4.27E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	2.49E+14

LID Offset	
DCV (ac-ft)	136.2
% of TDA treated	13.9%
Max Offset Impervious Area (ac)	147.9

Hydromodification*	
Existing Imperviousness	68.8%
Max Additional Imp Offset (%)	7.4%
Impervious Surface Area Offset (ac)	78.1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Agricultural Field
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	39.5
Area Available of Irrigation (ac)	3,948.5



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 City of Ontario  
 BMP ID105216106

BMP Information	
Site ID	108902101
Co-Permittee	City of Rancho Cucamonga
TDA (ac)	5,469.4
BMP Footprint (ac)	72.2
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	EDB with Infiltration

LID Offset	
DCV (ac-ft)	724.4
% of TDA treated	10.8%
Max Offset Impervious Area (ac)	588.4

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona Rd	Mill-Cucamonga Creek at Chino-Corona Rd
Total Dry-weather Flow (gal/day)	8.05E+06	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	6.20E+14	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	8.85E+03
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	2.13E+14

Hydromodification*	
Existing Imperviousness	7.9%
Max Additional Imp Offset (%)	10.9%
Impervious Surface Area Offset (ac)	593.2

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 City of Rancho Cucamonga  
 BMP ID108902101

BMP Information	
Site ID	7th Street Park
Co-Permittee	City of Yucaipa
TDA (ac)	1,116
BMP Footprint (ac)	2
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	131
% of TDA treated	0.8%
Max Offset Impervious Area (ac)	9

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	7th Street Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	4
Area Available of Irrigation (ac)	433

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	1.12E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	5.97E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.77E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	8.86E+12

Hydromodification*	
Existing Imperviousness	54.6%
Max Additional Imp Offset (%)	2.6%
Impervious Surface Area Offset (ac)	0

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF GIS  
Sources: Caltrans; ESRI; SB DPW; SB Permittees; Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 3  
City of Yucaipa  
BMP ID 7th Street Park

BMP Information	
Site ID	Almeria Park
Co-Permittee	City of Fontana
TDA (ac)	132
BMP Footprint (ac)	0.27
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	19
% of TDA treated	1.6%
Max Offset Impervious Area (ac)	2

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Almeria Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	1
Area Available of Irrigation (ac)	61

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	1.32E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	7.05E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.05E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	2.73E+12

Hydromodification*	
Existing Imperviousness	77.7%
Max Additional Imp Offset (%)	2.3%
Impervious Surface Area Offset (ac)	3

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF CONSULTING GIS  
 Sources: Caltrans; ESRI; SR DPW; SR Permittees; Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of Fontana  
 BMP ID: Almeria\_F

BMP Information	
Site ID	Anne Shirrells Park
Co-Permittee	City of San Bernardino
TDA (ac)	1,260
BMP Footprint (ac)	4
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	166
% of TDA treated	2.5%
Max Offset Impervious Area (ac)	32

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Anne Shirrells Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	9
Area Available of Irrigation (ac)	870

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	1.26E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	6.74E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.29E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	4.23E+13

Hydromodification*	
Existing Imperviousness	53.6%
Max Additional Imp Offset (%)	3.1%
Impervious Surface Area Offset (ac)	39

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of San Bernardino  
 BMP ID Anne Shirrells Park

BMP Information	
Site ID	Aquatic Fields
Co-Permittee	City of Fontana
TDA (ac)	46
BMP Footprint (ac)	1
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	7
% of TDA treated	8.9%
Max Offset Impervious Area (ac)	4

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Aquatic Fields
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	1
Area Available of Irrigation (ac)	133

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	4.55E+03	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.44E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.31E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	4.55E+12

Hydromodification*	
Existing Imperviousness	60.5%
Max Additional Imp Offset (%)	5.2%
Impervious Surface Area Offset (ac)	2

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 City of Fontana  
 BMP ID: Aquatic\_F

BMP Information	
Site ID	Bryn Mawr Veterans Memorial Park
Co-Permittee	City of Loma Linda
TDA (ac)	375
BMP Footprint (ac)	0
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Device

LID Offset	
DCV (ac-ft)	38
% of TDA treated	0.4%
Max Offset Impervious Area (ac)	2

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	3.75E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.00E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.41E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	1.15E+12

Hydromodification*	
Existing Imperviousness	59.7%
Max Additional Imp Offset (%)	1.9%
Impervious Surface Area Offset (ac)	7

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 3  
 City of Loma Linda  
 BMP ID Bryn Mawr Veterans Memorial Park

BMP Information	
Site ID	Catawba Fields
Co-Permittee	City of Fontana
TDA (ac)	2,725
BMP Footprint (ac)	9
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	307
% of TDA treated	3.3%
Max Offset Impervious Area (ac)	89

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Catawba Fields
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	21
Area Available of Irrigation (ac)	2,096

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	1.70E+06	n/a
Influent E. Coli (cfu/100mL)	183	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.77E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.44E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.07E+14

Hydromodification*	
Existing Imperviousness	60.7%
Max Additional Imp Offset (%)	2.7%
Impervious Surface Area Offset (ac)	74

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of Fontana  
 BMP ID: Catawba\_F

BMP Information	
Site ID	Centennial Park
Co-Permittee	City of Ontario
TDA (ac)	67
BMP Footprint (ac)	1
Soil Type	C
Feasibility of Infiltration?	No
BMP Type	Biofiltration

LID Offset	
DCV (ac-ft)	9
% of TDA treated	15.8%
Max Offset Impervious Area (ac)	11

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Ontario Centennial Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	2
Area Available of Irrigation (ac)	218

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Prado Park Lake	Prado Park Lake
Total Dry-weather Flow (gal/day)	6.68E+03	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	600	n/a
Annual load reduction E. Coli (cfu/yr)	0.00E+00	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.49E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	3.49E+04
Annual load reduction Fecal Coliform (MPN)	n/a	0.00E+00

Hydromodification*	
Existing Imperviousness	55.2%
Max Additional Imp Offset (%)	1.0%
Impervious Surface Area Offset (ac)	1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF  
GENERALIST  
GIS

Sources: Caltrans; ESRI; SB DPW; SB Permittees; Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1  
City of Ontario  
BMP ID: Centennial\_0

BMP Information	
Site ID	Elmer Digneo Park
Co-Permittee	City of Loma Linda
TDA (ac)	741
BMP Footprint (ac)	1
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	76
% of TDA treated	0.9%
Max Offset Impervious Area (ac)	6

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	ma Linda Community Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	3
Area Available of Irrigation (ac)	276

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	7.41E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	3.97E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.15E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	6.43E+12

Hydromodification*	
Existing Imperviousness	45.8%
Max Additional Imp Offset (%)	2.4%
Impervious Surface Area Offset (ac)	18

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF GIS  
Sources: Caltrans; ESRI; SB DPW; SB Permittees; Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 3  
City of Loma Linda  
BMP IDElmer Digneo Park

BMP Information	
Site ID	George E. Brown Park
Co-Permittee	City of Colton
TDA (ac)	207
BMP Footprint (ac)	4
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	24
% of TDA treated	17.5%
Max Offset Impervious Area (ac)	36

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Wesly Valley Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	9
Area Available of Irrigation (ac)	888

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	2.07E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.11E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.47E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	4.56E+13

Hydromodification*	
Existing Imperviousness	53.7%
Max Additional Imp Offset (%)	11.2%
Impervious Surface Area Offset (ac)	23

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of Colton  
 BMP ID George E. Brown Jr. Park

BMP Information	
Site ID	Hunters Ridge Park
Co-Permittee	City of Fontana
TDA (ac)	152
BMP Footprint (ac)	0
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Device

LID Offset	
DCV (ac-ft)	25
% of TDA treated	0.8%
Max Offset Impervious Area (ac)	1

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Hunter's Ridge Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	0.43
Area Available of Irrigation (ac)	43

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	1.52E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	8.12E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.46E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.58E+12

Hydromodification*	
Existing Imperviousness	60.1%
Max Additional Imp Offset (%)	2.3%
Impervious Surface Area Offset (ac)	3

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF CONSULTING GIS  
 Sources: Caltrans; ESR; SB DPV; SB Permittees; Microsoft Canale Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 City of Fontana  
 BMP ID: Hunters\_F

BMP Information	
Site ID	Koehler Park
Co-Permittee	City of Fontana
TDA (ac)	62
BMP Footprint (ac)	1
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	9
% of TDA treated	10.8%
Max Offset Impervious Area (ac)	7

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Koehler Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	2
Area Available of Irrigation (ac)	201

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	6.16E+03	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	3.30E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.76E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	8.20E+12

Hydromodification*	
Existing Imperviousness	72.7%
Max Additional Imp Offset (%)	5.4%
Impervious Surface Area Offset (ac)	3

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF GIS  
Sources: Caltrans; ESRI; SB DPW; SB Permittees; Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1  
City of Fontana  
BMP ID:Koehler\_F

BMP Information	
Site ID	Littlefield-Schultis Park
Co-Permittee	City of San Bernardino
TDA (ac)	99
BMP Footprint (ac)	7
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	16
% of TDA treated	44.6%
Max Offset Impervious Area (ac)	44

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	9.90E+03	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	5.30E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.11E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	6.95E+13

Hydromodification*	
Existing Imperviousness	61.7%
Max Additional Imp Offset (%)	21.2%
Impervious Surface Area Offset (ac)	21

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of San Bernardino  
 BMP ID Littlefield-Schultis Memorial Park

BMP Information	
Site ID	McDermott Park
Co-Permittee	City of Fontana
TDA (ac)	1,994
BMP Footprint (ac)	2
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona Rd	Mill-Cucamonga Creek at Chino-Corona Rd
Total Dry-weather Flow (gal/day)	2.94E+06	n/a
Influent E. Coli (cfu/100mL)	863	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	5.17E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.36E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.50E+13

LID Offset	
DCV (ac-ft)	254
% of TDA treated	0.8%
Max Offset Impervious Area (ac)	16

Hydromodification*	
Existing Imperviousness	56.1%
Max Additional Imp Offset (%)	1.7%
Impervious Surface Area Offset (ac)	34

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	North Heritage Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	4
Area Available of Irrigation (ac)	429



BMP Information	
Site ID	Meadowbrook Park
Co-Permittee	City of San Bernardino
TDA (ac)	889
BMP Footprint (ac)	5
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	102
% of TDA treated	5.3%
Max Offset Impervious Area (ac)	47

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Meadowbrook Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	11
Area Available of Irrigation (ac)	1,121

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	8.89E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	4.76E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.90E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	6.47E+13

Hydromodification*	
Existing Imperviousness	63.7%
Max Additional Imp Offset (%)	4.8%
Impervious Surface Area Offset (ac)	43

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of San Bernardino  
 BMP ID Meadowbrook Park

BMP Information	
Site ID	Nunez Park
Co-Permittee	City of San Bernardino
TDA (ac)	878
BMP Footprint (ac)	3
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	109
% of TDA treated	2.7%
Max Offset Impervious Area (ac)	23

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Gateway Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	6
Area Available of Irrigation (ac)	602

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	8.78E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	4.70E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.86E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	3.44E+13

Hydromodification*	
Existing Imperviousness	69.9%
Max Additional Imp Offset (%)	6.1%
Impervious Surface Area Offset (ac)	2,314,133

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 2  
City of San Bernardino  
BMP ID Nunez Park

BMP Information	
Site ID	Oak Park
Co-Permittee	City of Fontana
TDA (ac)	158
BMP Footprint (ac)	1
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	18
% of TDA treated	6.6%
Max Offset Impervious Area (ac)	10

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Oak Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	2
Area Available of Irrigation (ac)	243

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona Rd	Mill-Cucamonga Creek at Chino-Corona Rd
Total Dry-weather Flow (gal/day)	1.51E+04	n/a
Influent E. Coli (cfu/100mL)	4053	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	5.48E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.96E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	1.06E+13

Hydromodification*	
Existing Imperviousness	74.6%
Max Additional Imp Offset (%)	4.5%
Impervious Surface Area Offset (ac)	7

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF GIS  
Sources: Caltrans, ESRI, SB DPW, SB Permittees, Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1  
City of Fontana  
BMP ID: Oak\_F

BMP Information	
Site ID	Perris Hill Park
Co-Permittee	City of San Bernardino
TDA (ac)	148
BMP Footprint (ac)	2
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	18
% of TDA treated	5.8%
Max Offset Impervious Area (ac)	9

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	1.48E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	7.92E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	6.60E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	2.16E+13

Hydromodification*	
Existing Imperviousness	50.0%
Max Additional Imp Offset (%)	5.9%
Impervious Surface Area Offset (ac)	9

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF  
GIS  
Sources: Caltrans, ESRI, SB DPW, SB Permitted, Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 2  
City of San Bernardino  
BMP ID Perris Hill Park

BMP Information	
Site ID	Ranch Park
Co-Permittee	City of Ontario
TDA (ac)	12
BMP Footprint (ac)	0
Soil Type	C
Feasibility of Infiltration?	No
BMP Type	Biofiltration

LID Offset	
DCV (ac-ft)	2
% of TDA treated	19.4%
Max Offset Impervious Area (ac)	2

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona Rd	Mill-Cucamonga Creek at Chino-Corona Rd
Total Dry-weather Flow (gal/day)	2.02E+03	n/a
Influent E. Coli (cfu/100mL)	868	n/a
Expected Effluent E. Coli (cfu/100mL)	868	n/a
Annual load reduction E. Coli (cfu/yr)	0.00E+00	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.05E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	3.05E+04
Annual load reduction Fecal Folicorm (MPN)	n/a	0.00E+00

Hydromodification*	
Existing Imperviousness	78.5%
Max Additional Imp Offset (%)	2.3%
Impervious Surface Area Offset (ac)	0.28

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1  
City of Ontario  
BMP IDRanch\_O

BMP Information	
Site ID	San Sevaine Park
Co-Permittee	City of Fontana
TDA (ac)	39
BMP Footprint (ac)	0
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Device

LID Offset	
DCV (ac-ft)	6
% of TDA treated	3.3%
Max Offset Impervious Area (ac)	1

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	San Sevaine Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	0
Area Available of Irrigation (ac)	43

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	3.86E+03	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.07E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.24E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	2.07E+12

Hydromodification*	
Existing Imperviousness	74.4%
Max Additional Imp Offset (%)	3.2%
Impervious Surface Area Offset (ac)	1

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBF  
G&S  
Sources: Caltrans, ESRI, SB DPW, SB Permittees, Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1  
City of Fontana  
BMP ID: SanSevaine\_F

BMP Information	
Site ID	Southridge Park
Co-Permittee	City of Fontana
TDA (ac)	19
BMP Footprint (ac)	1
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	2
% of TDA treated	49.5%
Max Offset Impervious Area (ac)	9

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Southridge Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	2
Area Available of Irrigation (ac)	214

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Mill-Cucamonga Creek at Chino-Corona Rd	Mill-Cucamonga Creek at Chino-Corona Rd
Total Dry-weather Flow (gal/day)	1.77E+03	n/a
Influent E. Coli (cfu/100mL)	4053	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	6.42E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.85E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	1.22E+13

Hydromodification*	
Existing Imperviousness	72.2%
Max Additional Imp Offset (%)	17.1%
Impervious Surface Area Offset (ac)	3

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 1  
 City of Fontana  
 BMP ID: Southridge\_F

BMP Information	
Site ID	Speicher Park
Co-Permittee	City of San Bernardino
TDA (ac)	4,373
BMP Footprint (ac)	2
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	519
% of TDA treated	0.3%
Max Offset Impervious Area (ac)	15

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Belcher Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	4
Area Available of Irrigation (ac)	362

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	4.37E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.34E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.75E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	9.39E+12

Hydromodification*	
Existing Imperviousness	23.0%
Max Additional Imp Offset (%)	1.9%
Impervious Surface Area Offset (ac)	84

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of San Bernardino  
 BMP ID Speicher Park

BMP Information	
Site ID	Strickling Park
Co-Permittee	City of Chino Hills
TDA (ac)	101
BMP Footprint (ac)	1
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	13
% of TDA treated	3.2%
Max Offset Impervious Area (ac)	3

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Strickling Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	2
Area Available of Irrigation (ac)	171

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Prado Park Lake	Prado Park Lake
Total Dry-weather Flow (gal/day)	1.01E+04	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	5.38E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	2.67E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	3.38E+12

Hydromodification*	
Existing Imperviousness	67.7%
Max Additional Imp Offset (%)	5.0%
Impervious Surface Area Offset (ac)	5

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



RBFG CONSULTING GIS  
Sources: Caltrans, ESRI, US OPWV SS Permeables, Microsoft Satellite Imagery

SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
Flood Zone 1  
City of Chino Hills  
BMP ID: Strickling\_CH

BMP Information	
Site ID	Summit Heights Park
Co-Permittee	City of Fontana
TDA (ac)	40
BMP Footprint (ac)	1
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	6
% of TDA treated	7.6%
Max Offset Impervious Area (ac)	3

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Rosena Park West
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	2
Area Available of Irrigation (ac)	190

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	4.03E+03	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.15E+11	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	3.39E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	4.75E+12

Hydromodification*	
Existing Imperviousness	79.3%
Max Additional Imp Offset (%)	4.4%
Impervious Surface Area Offset (ac)	2

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



BMP Information	
Site ID	Sycamore Park
Co-Permittee	City of Fontana
TDA (ac)	133
BMP Footprint (ac)	1
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	15
% of TDA treated	5.2%
Max Offset Impervious Area (ac)	7

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Sycamore Hills Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	2
Area Available of Irrigation (ac)	162

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	8.27E+04	n/a
Influent E. Coli (cfu/100mL)	183	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	1.35E+12	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	5.84E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Folicorm (MPN)	n/a	1.40E+13

Hydromodification*	
Existing Imperviousness	76.4%
Max Additional Imp Offset (%)	3.1%
Impervious Surface Area Offset (ac)	4

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of Fontana  
 BMP IDsycamore\_F

BMP Information	
Site ID	Verdemont Park
Co-Permittee	City of San Bernardino
TDA (ac)	5,460
BMP Footprint (ac)	3
Soil Type	A
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	973
% of TDA treated	0.3%
Max Offset Impervious Area (ac)	15

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Verdemont Park
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	6
Area Available of Irrigation (ac)	571

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	5.46E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.92E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	7.11E+03
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	6.01E+12

Hydromodification*	
Existing Imperviousness	3.2%
Max Additional Imp Offset (%)	1.9%
Impervious Surface Area Offset (ac)	106

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



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SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 2  
 City of San Bernardino  
 BMP ID: Verdemont Park

BMP Information	
Site ID	Yucaipa Valley Golf Club
Co-Permittee	City of Yucaipa
TDA (ac)	11,956
BMP Footprint (ac)	5
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	1,408
% of TDA treated	0.2%
Max Offset Impervious Area (ac)	22

Harvest/Use	
Feasible?	Yes
Facility to be Irrigated	Yucaipa Valley Golf Club
BMP Depth (ft)	5
Harvest Demand (ac-ft/day)	11
Area Available of Irrigation (ac)	1,062

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	1.20E+06	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	4.45E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	1.23E+04
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	9.68E+12

Hydromodification*	
Existing Imperviousness	22.9%
Max Additional Imp Offset (%)	1.8%
Impervious Surface Area Offset (ac)	214

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 3  
 City of Yucaipa  
 BMP ID Yucaipa Valley Golf Club

BMP Information	
Site ID	Yucaipa Equestrian Center
Co-Permittee	City of Yucaipa
TDA (ac)	4,901
BMP Footprint (ac)	6
Soil Type	B
Feasibility of Infiltration?	Yes
BMP Type	Infiltration Basin

LID Offset	
DCV (ac-ft)	601
% of TDA treated	0.5%
Max Offset Impervious Area (ac)	25

Harvest/Use	
Feasible?	No
Facility to be Irrigated	None within 1000'
BMP Depth (ft)	-
Harvest Demand (ac-ft/day)	-
Area Available of Irrigation (ac)	-

TMDLs		
TMDL	Middle SAR Bacterial Indicator for dry-weather	Middle SAR Bacterial Indicator for wet-weather
Downstream MS	Santa Ana River at MWD Crossing	Santa Ana River at MWD Crossing
Total Dry-weather Flow (gal/day)	5.35E+05	n/a
Influent E. Coli (cfu/100mL)	600	n/a
Expected Effluent E. Coli (cfu/100mL)	0	n/a
Annual load reduction E. Coli (cfu/yr)	2.86E+13	n/a
Influent Fecal Coliform (MPN/100mL)	n/a	9.48E+03
Expected Effluent Fecal Coliform (MPN/100 mL)	n/a	0.00E+00
Annual load reduction Fecal Coliform (MPN)	n/a	8.84E+12

Hydromodification*	
Existing Imperviousness	20.7%
Max Additional Imp Offset (%)	5.0%
Impervious Surface Area Offset (ac)	267

\*Based on volumetric analysis only; mitigation of peak flow and duration will be address by the design of BMP outlet structure.



SAN BERNARDINO RETROFIT OPPORTUNITIES STUDY  
 Flood Zone 3  
 City of Yucaipa  
 BMP ID Yucaipa Equestrian Center