

TMDL Technical Report

Section 4: Source Assessment

CREST Steering Committee/WT Group
June 8, 2009

SECTION

JUNE 2009

DRAFT

Los Angeles River Watershed
Bacteria TMDL – Source
Assessment Technical Report
Section

Prepared for:

CLEANER RIVERS THROUGH EFFECTIVE STAKEHOLDER-LED TMDLS
(CREST)

Prepared by:

CREST CONSULTING TEAM

APPENDIX



**APPENDIX A:
Source Assessment and
Receiving Water Data Analysis
for the Los Angeles River Watershed
Bacteria TMDL**

May 2009



SECTION

4	Source Assessment.....	1
4.1	NPDES-permitted Discharges.....	1
4.1.1	Municipal Stormwater	1
4.1.2	Municipal Wastewater	2
4.1.3	Industrial Stormwater.....	4
4.1.4	Industrial Wastewater	5
4.1.5	Non-Stormwater and Non-wastewater Discharges.....	6
4.2	Loadings from Point Sources	7
4.2.1	Municipal Wastewater Effluent	7
4.2.2	Municipal Wastewater Collections Systems.....	7
4.2.3	Storm Drain Discharges.....	10
4.3	Non-Point Sources.....	16
4.3.1	Onsite Wastewater Treatment Systems	16
4.3.2	Natural Runoff from Headwaters.....	17
4.3.3	In-channel Sources.....	18
4.4	Summary of Sources	20
4.5	References	21

APPENDIX

1	Introduction	1
2	Overview of LA River Bacteria Fate & Transport	2
2.1	Brief Review of Indicators and Pathogens	2
2.2	Simple Conceptual Model of Indicator Bacteria in the LA River	6
2.2.1	Non-Conservative Bacteria Fate and Transport Parameters	8
3	Data Compilation and Analysis Methods	13
3.1	Datasets used for Source Assessment	13
3.2	Categorization of Water Quality Data	17
3.3	Statistical Methods for Quantitative Source Assessment	19
3.3.1	Handling of Non-Detect Data	19
3.3.2	Calculation of Loading Rates	20
3.3.3	Plots	20
3.3.4	Statistical Differences Among Sites	20
3.3.5	Correlations among Parameters	21
4	Assessment of the LA River and its Tributaries	22
4.1	Mainstem LA River	24
4.1.1	Flow Rates	24
4.1.2	Dry Weather Conditions	27
4.1.3	Wet Weather Conditions	38
4.2	Tributaries to the LA River	55
4.2.1	Tributary Flow Rates	56
4.2.2	Bacteria Concentrations in Tributaries	58
4.2.3	Intra-Storm Variability in Tributaries	64
5	Wastewater Sources	68
5.1	Municipal Wastewater	68
5.1.1	Overview of WRPs in the Watershed	68
5.1.2	Tertiary-treated, Disinfected Effluent Discharges	70
5.1.3	Discharges from Wastewater Collection Systems	74
5.1.4	Non-SSO Municipal Wastewater Influences and IDIC Programs	87
5.2	Onsite Wastewater Treatment Systems	87
5.3	Industrial Wastewater	89
6	Watershed-Wide Sources	90
6.1	Homeless Persons	90
6.2	Domestic Pets	94
6.3	Food Waste and Trash	96
6.4	Equestrian Activities	96
6.5	Wildlife	100
6.5.1	Birds	100
6.5.2	Other Wildlife	103
6.6	Natural/Reference Conditions	103
7	Non-Wastewater and Non-Stormwater Permitted Sources	112
8	Urban Runoff	113
8.1	Industrial Stormwater	113
8.2	Runoff from Construction Activity	115
8.3	Municipal Separate Storm Sewer Systems	115
8.3.1	NPDES MS4 Permits in the Watershed	116
8.3.2	Dry Weather Storm Drain Discharges	117
8.3.3	Wet Weather Urban Runoff	156
9	References	163

Technical Report *Section*

Permits for and Description of Point Sources

4	Source Assessment.....	1
4.1	NPDES-permitted Discharges.....	1
4.1.1	Municipal Stormwater	1
4.1.2	Municipal Wastewater	2
4.1.3	Industrial Stormwater.....	4
4.1.4	Industrial Wastewater	5
4.1.5	Non-Stormwater and Non-wastewater Discharges.....	6
4.2	Loadings from Point Sources	7
4.2.1	Municipal Wastewater Effluent	7
4.2.2	Municipal Wastewater Collections Systems.....	7
4.2.3	Storm Drain Discharges	10
4.3	Non-Point Sources.....	16
4.3.1	Onsite Wastewater Treatment Systems	16
4.3.2	Natural Runoff from Headwaters.....	17
4.3.3	In-channel Sources.....	18
4.4	Summary of Sources	20
4.5	References	21

Table 4 - 1. Summary of Municipal Stormwater NPDES Permits in the LA River Watershed

Permittee	NPDES Permit Number	NPDES Permit Effective Date	Total Area Covered (sq. mi.)	Total Area Covered in Watershed (sq. mi.)	% of LA River Watershed
Los Angeles County (and 84 incorporated cities)	Order No. 01-82 CAS004001.	2001	3,100	801	96%
City of Long Beach	Order No. 99-060 CAS004003	1999	50	22	3%
Caltrans	Order No. 99-06 CAS000003	1999	136	11	1%

Table 4 - 2. Summary of Municipal Wastewater Discharges in the LA River Watershed

Municipal Wastewater Reclamation Plant	NPDES Permit Number	NPDES Permit Adoption Date	Design Capacity (mgd)	Effluent Limitations for Total Coliform (MPN/100mL)	
				7-day Median	30-day Single Sample
Donald C. Tillman Water Reclamation Plant	CA0056227 R4-2006-0091	9/28/2006	80	<2.2	<23
Los Angeles-Glendale Water Reclamation Plant	CA0053953 R4-2006-0092	9/28/2006	20	<2.2	<23
Burbank Water Reclamation Plant	CA0055531 R4-2006-0085	12/29/2006	12.5	<2.2	<23

Table 4 - 3. Individual Permits in the Watershed for Industrial Stormwater¹

Permittee	Facility	Location
Chevron U.S.A. Inc.	Van Nuys Terminal	Van Nuys, CA
Lubricating Specialties Co.	Pico Rivera, Oil Blending	8015 Paramount Blvd
Hexion Specialty Chemicals, Inc.	Hexion Specialty Chemicals, Inc.	2801 Lynwood Rd
Pabco Paper Products	Paperboard & Carton Mfg.	4460 Pacific Blvd
Metropolitan Transit Authority	Eastside Light Rail Trans Project	Altadena, CA 91001
BP West Coast Products LLC	East Hynes Facility	Alameda/Soto/Clarence
The Boeing Company	Santa Susana Field Lab	5800 Woolsey Canyon Rd
Los Angeles Turf Club	Santa Anita Park	285 W. Huntington Dr

¹ – From http://www.waterboards.ca.gov/losangeles/board_decisions/adopted_orders/

+ 2,929 General Industrial Stormwater Permits

Table 4 - 4. Individual Permits in the Watershed for Industrial Wastewater Discharges¹

Permittee	Facility	Location
Lincoln Avenue Water Co.	South Coulter Water Treatment	564 W. Harriet St
The Boeing Company	Santa Susana Field Lab	5800 Woolsey Canyon Rd
Owens-Brockway Glass Container	Glass Container Div, Vernon	2901 Fruitland Ave
Kaiser Aluminum Fabricated Products, LLC	Los Angeles, California Plant	6250 E. Bandini Blvd
Pacific Terminals, LLC	Dominguez Hills Tank Farm	2500 E. Victoria St

¹ – From http://www.waterboards.ca.gov/losangeles/board_decisions/adopted_orders/

Table 4 - 5. NPDES Permits in the Watershed for Non-Wastewater and Non-Stormwater Discharges¹

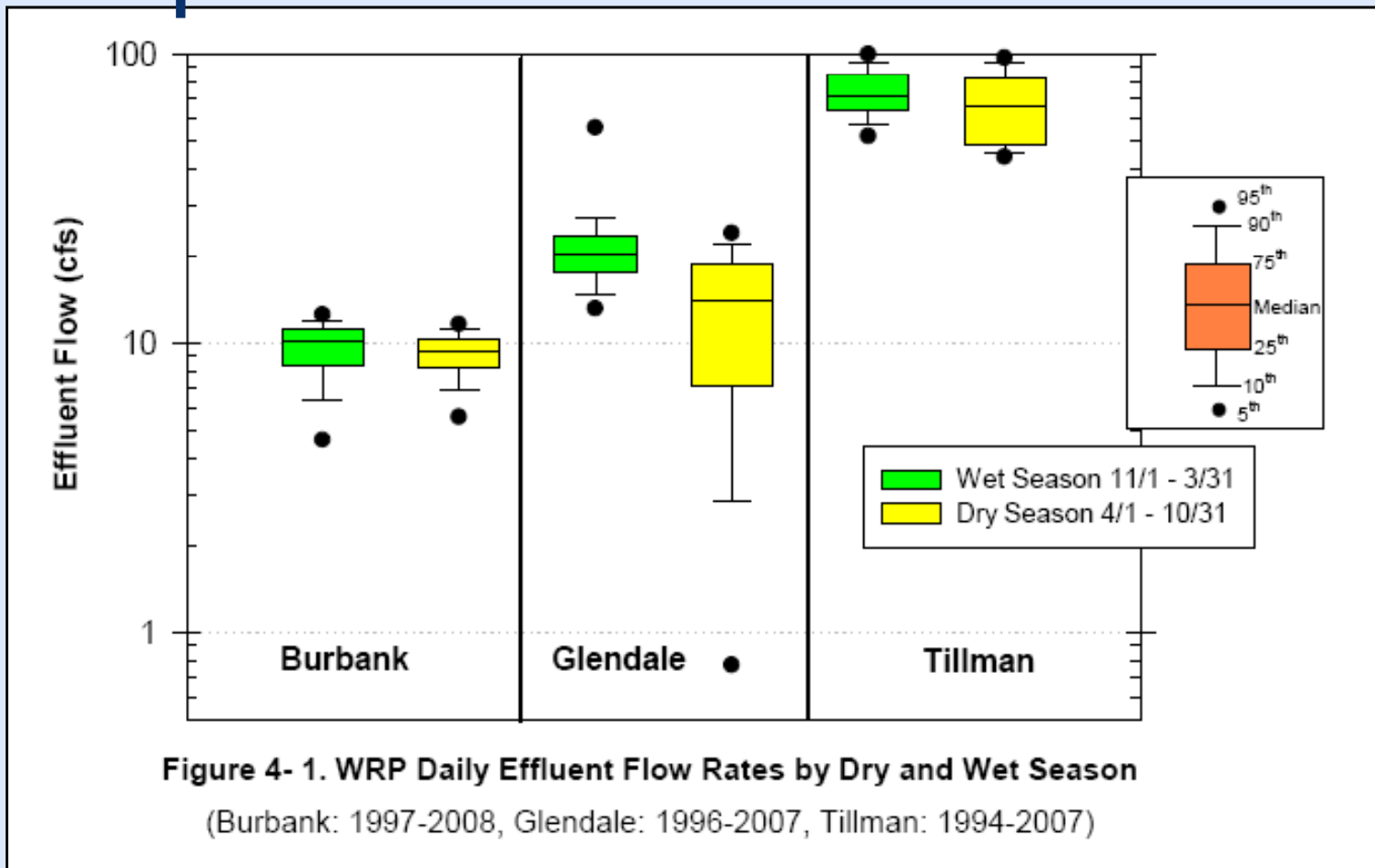
Type of Permit	Number
Municipal Construction and Dewatering Projects	6
Municipal Miscellaneous Activities	2
Construction and Project Dewatering	6
Petroleum Fuel Cleanup Sites	28
VOCs Cleanup Sites	2
Potable Water	48
Landfill Operations	2
Total	94

¹ – From http://www.waterboards.ca.gov/losangeles/board_decisions/adopted_orders/

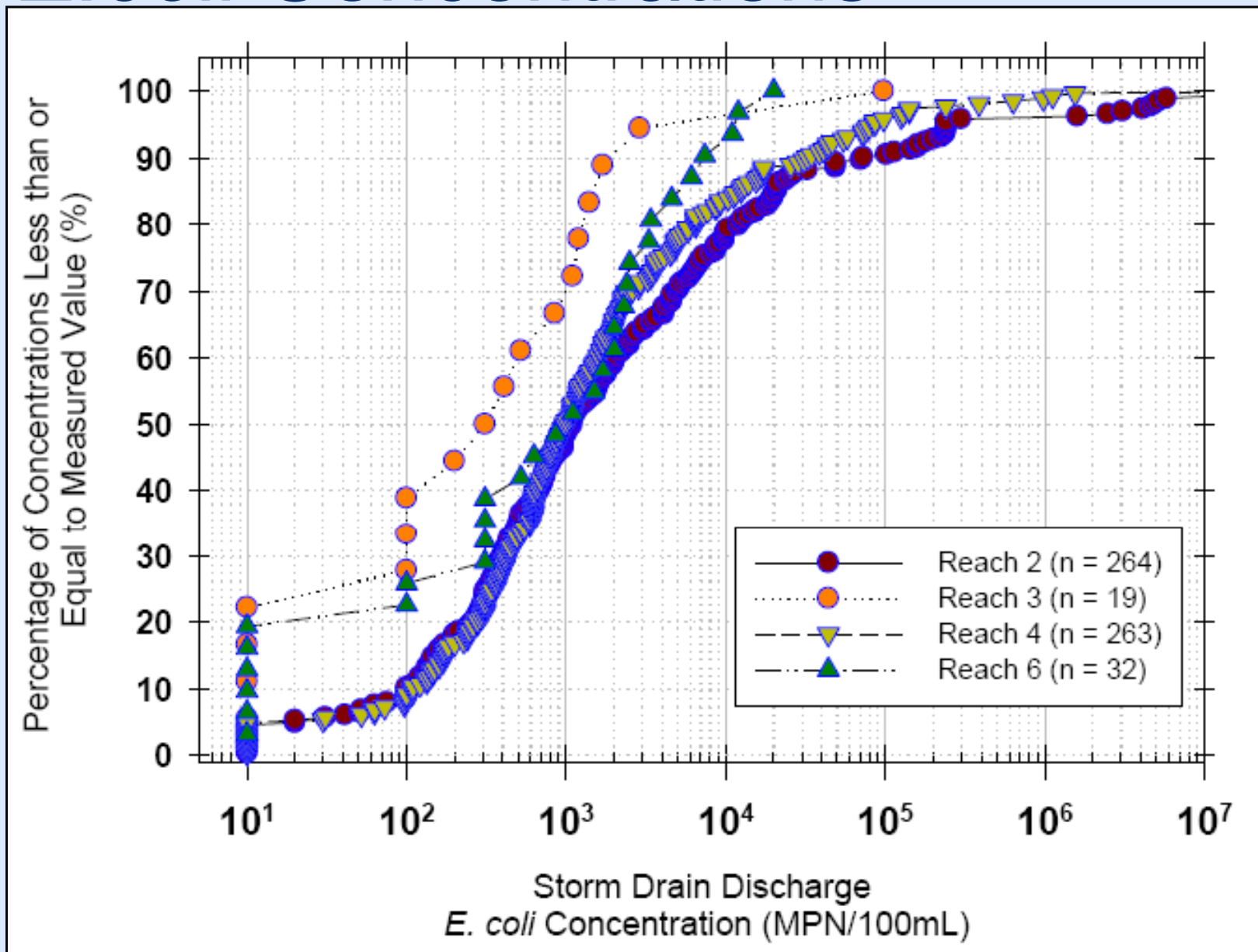
Bacteria Loading from Point Sources

4	Source Assessment.....	1
4.1	NPDES-permitted Discharges.....	1
4.1.1	Municipal Stormwater	1
4.1.2	Municipal Wastewater	2
4.1.3	Industrial Stormwater.....	4
4.1.4	Industrial Wastewater	5
4.1.5	Non-Stormwater and Non-wastewater Discharges.....	6
4.2	Loadings from Point Sources	7
4.2.1	Municipal Wastewater Effluent	7
4.2.2	Municipal Wastewater Collections Systems.....	7
4.2.3	Storm Drain Discharges	10
4.3	Non-Point Sources.....	16
4.3.1	Onsite Wastewater Treatment Systems	16
4.3.2	Natural Runoff from Headwaters.....	17
4.3.3	In-channel Sources.....	18
4.4	Summary of Sources	20
4.5	References	21

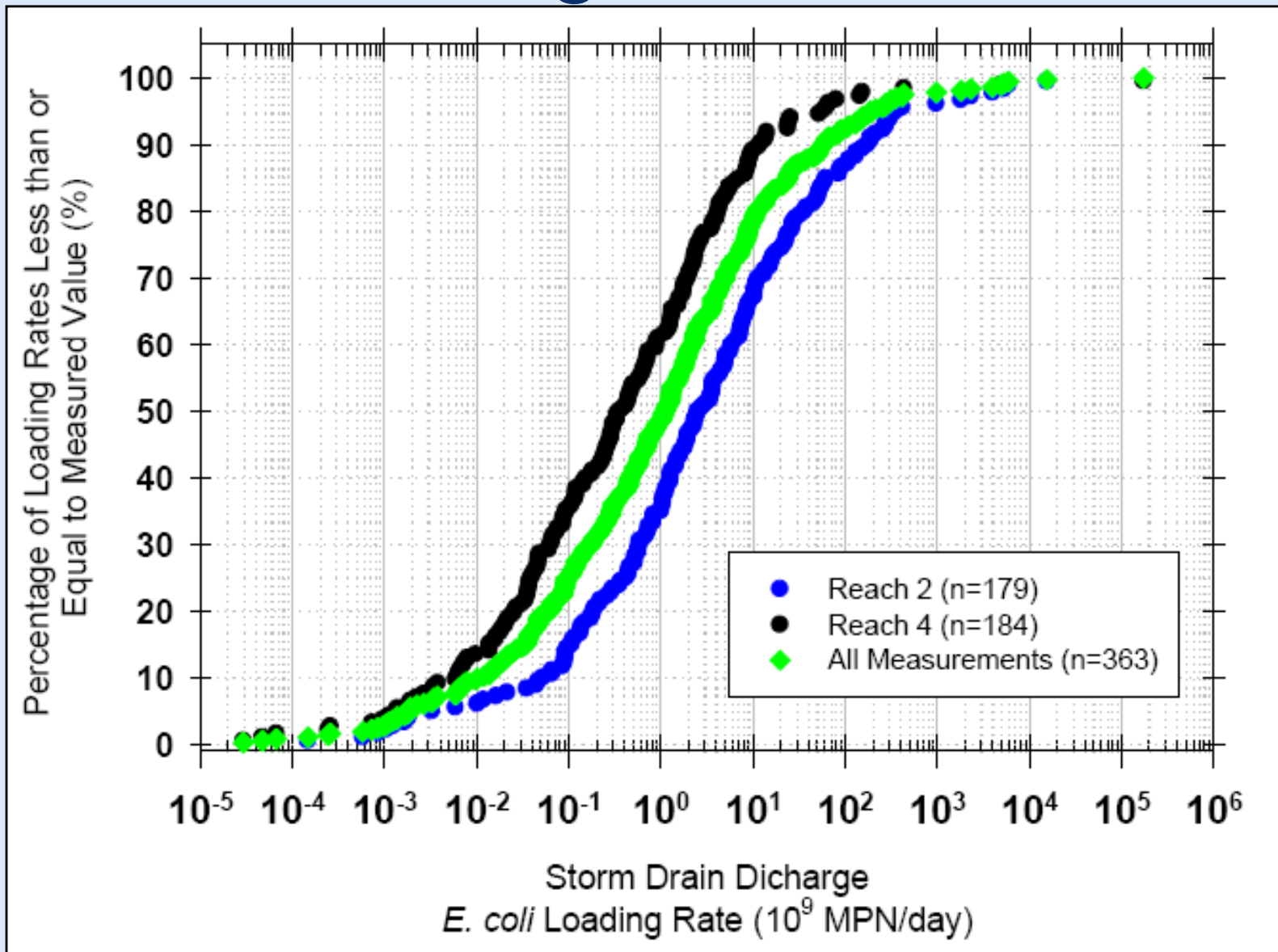
Municipal Wastewater Effluent



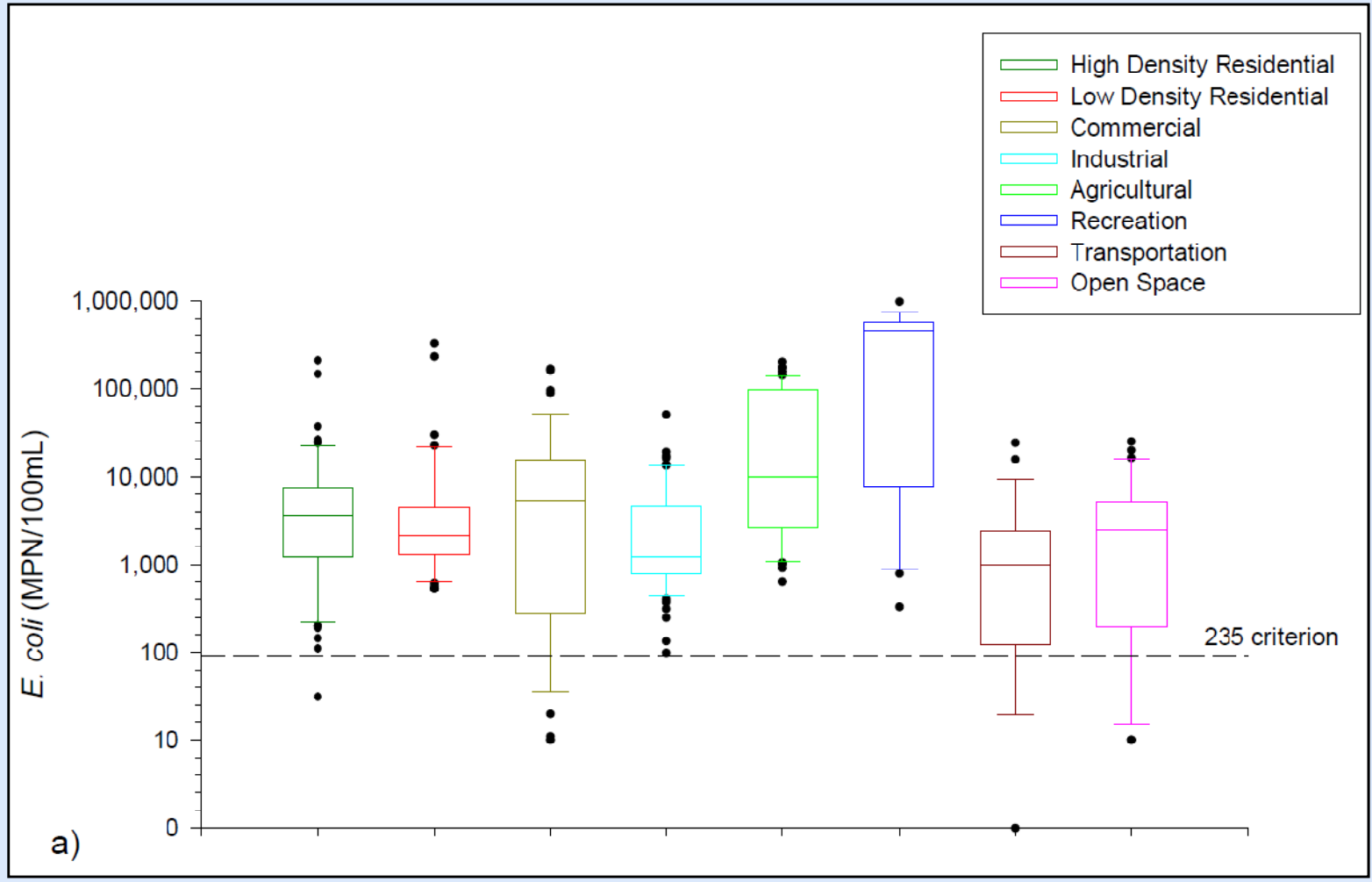
Dry Weather Urban Runoff: *E. coli* Concentrations

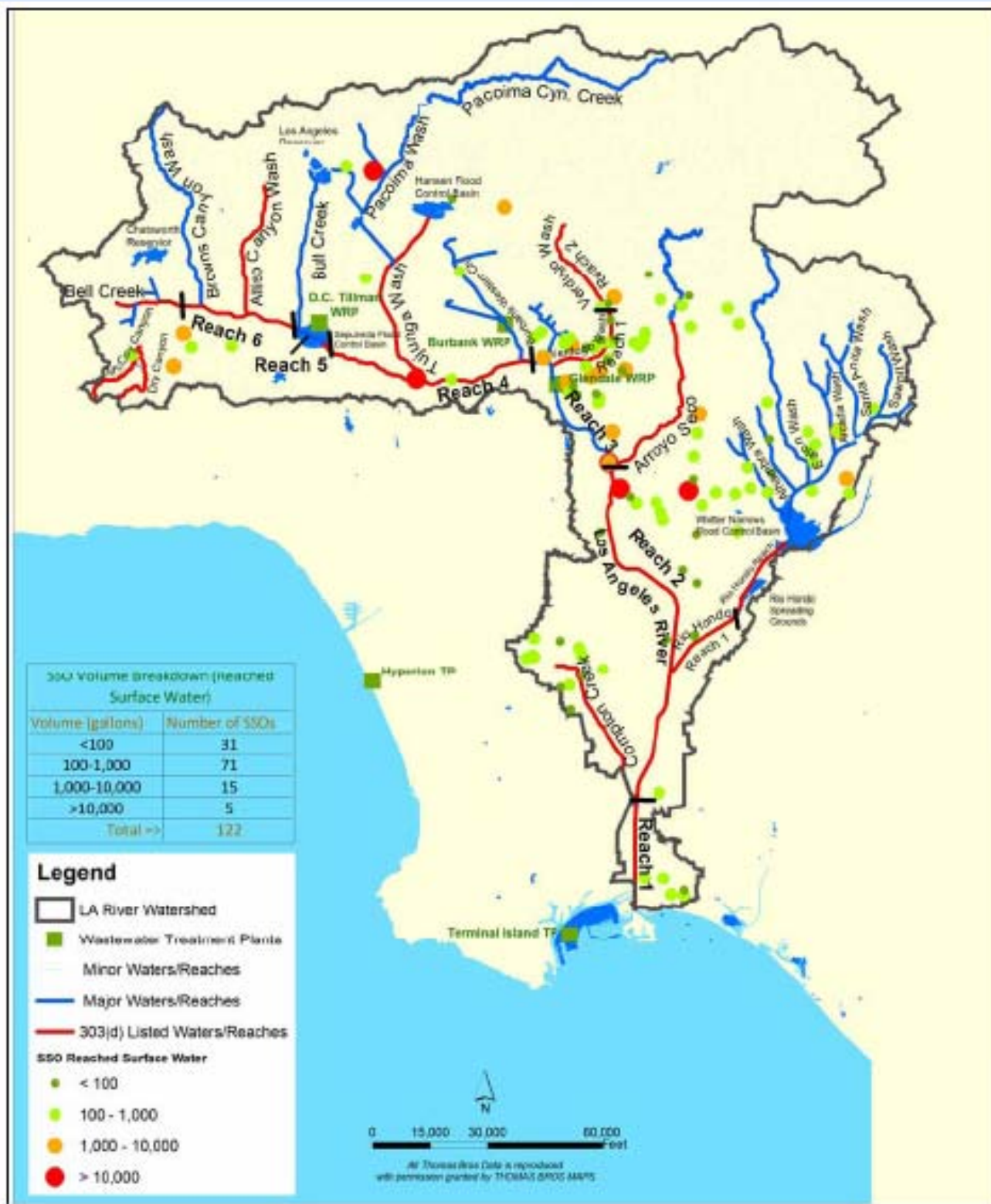


Dry Weather Urban Runoff: *E.coli* Loading Rates



Wet Weather Urban Runoff: *E.coli* Concentrations





SSOs

Description of Non-point Sources

4	Source Assessment.....	1
4.1	NPDES-permitted Discharges.....	1
4.1.1	Municipal Stormwater	1
4.1.2	Municipal Wastewater	2
4.1.3	Industrial Stormwater.....	4
4.1.4	Industrial Wastewater	5
4.1.5	Non-Stormwater and Non-wastewater Discharges.....	6
4.2	Loadings from Point Sources	7
4.2.1	Municipal Wastewater Effluent	7
4.2.2	Municipal Wastewater Collections Systems.....	7
4.2.3	Storm Drain Discharges	10
4.3	Non-Point Sources.....	16
4.3.1	Onsite Wastewater Treatment Systems	16
4.3.2	Natural Runoff from Headwaters.....	17
4.3.3	In-channel Sources.....	18
4.4	Summary of Sources	20
4.5	References	21

OWTS (Septic Systems)

City	Estimated Number of OWTS in Watershed based on available information	Comments
Los Angeles	<8,000	Historic information. Proportion currently in operation unknown
Burbank	0 (?)	OWTS are illegal in Burbank
Glendale	50	
Pasadena	10	

Natural Runoff from Headwaters (Dry Weather)

Table 4 - 6. *E. coli* Concentrations in Natural Dry Weather Runoff at the Headwaters of the Arroyo Seco
(Tiefenthaler et al., 2008)

<i>E. coli</i> Statistic	Single Samples	30-day Geometric Means ¹
Number of Samples	49	30
Number of Samples > WQO	0 (0%)	0 (0%)
Mean ²	23	21
Minimum ²	< 10	< 10
10 th Percentile ²	< 10	< 10
25 th Percentile ²	< 10	12
Median ²	< 10	15
75 th Percentile ²	15	28
90 th Percentile ²	56	41
Maximum ²	148	53

1 – Based on instances when five samples were collected within a 30-day period. The calculated geometric mean was rolling based on approximately weekly sampling.

2 – Units are MPN/100mL

In-channel Sources to Reach 2 (Dry Weather)

Source	Likelihood
Groundwater	Low
Human fecal discharges	Low
Birds	Moderate
Regrowth in Sediments	Moderate
Regrowth/Resuscitation in Water Column	Moderate

Technical Report *Appendix*



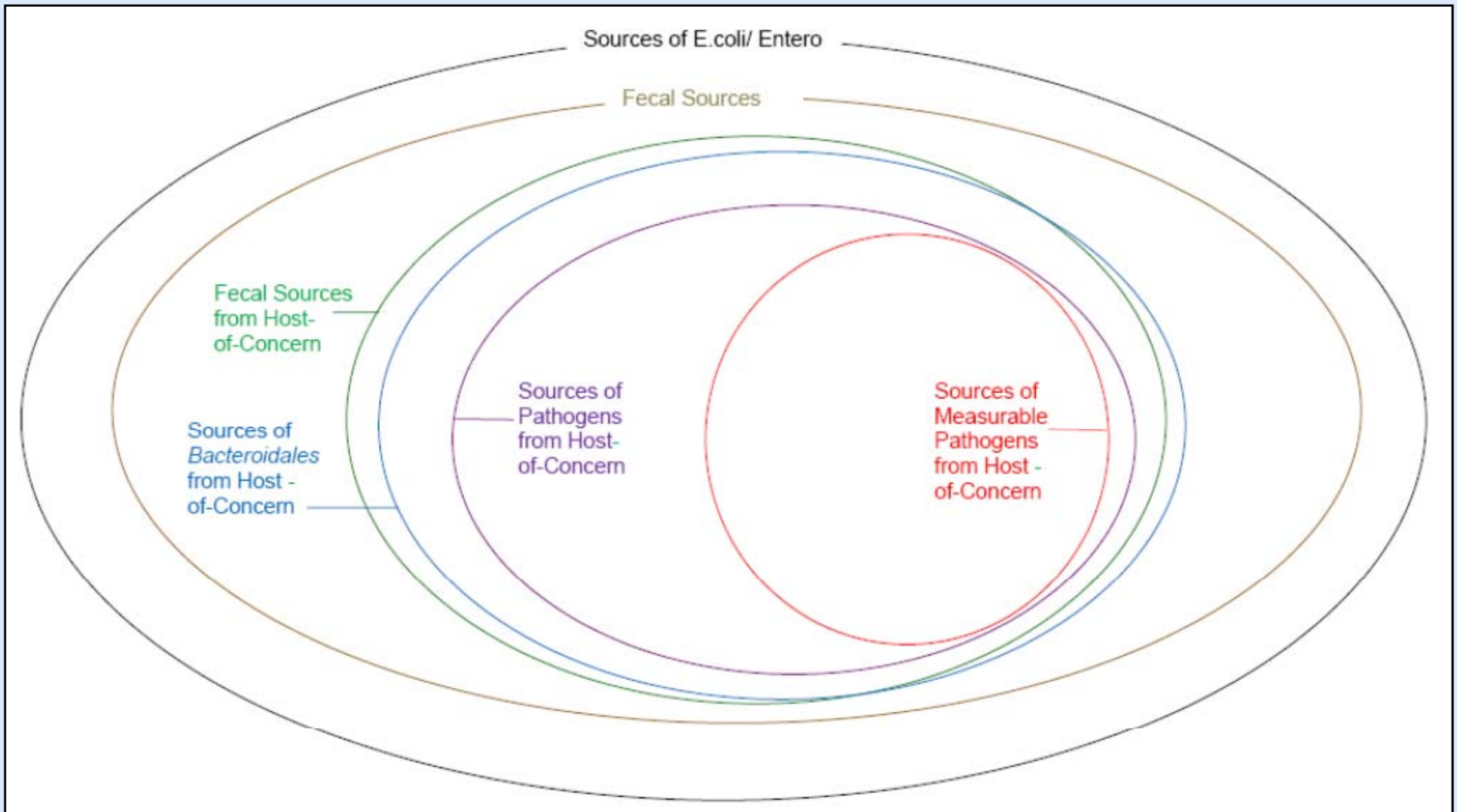
**APPENDIX A:
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Receiving Water Data Analysis
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Bacteria TMDL**

May 2009



Appendix Section 1 & 2

1	Introduction.....	1
2	Overview of LA River Bacteria Fate & Transport.....	2
2.1	Brief Review of Indicators and Pathogens.....	2
2.2	Simple Conceptual Model of Indicator Bacteria in the LA River.....	6
2.2.1	Non-Conservative Bacteria Fate and Transport Parameters.....	8



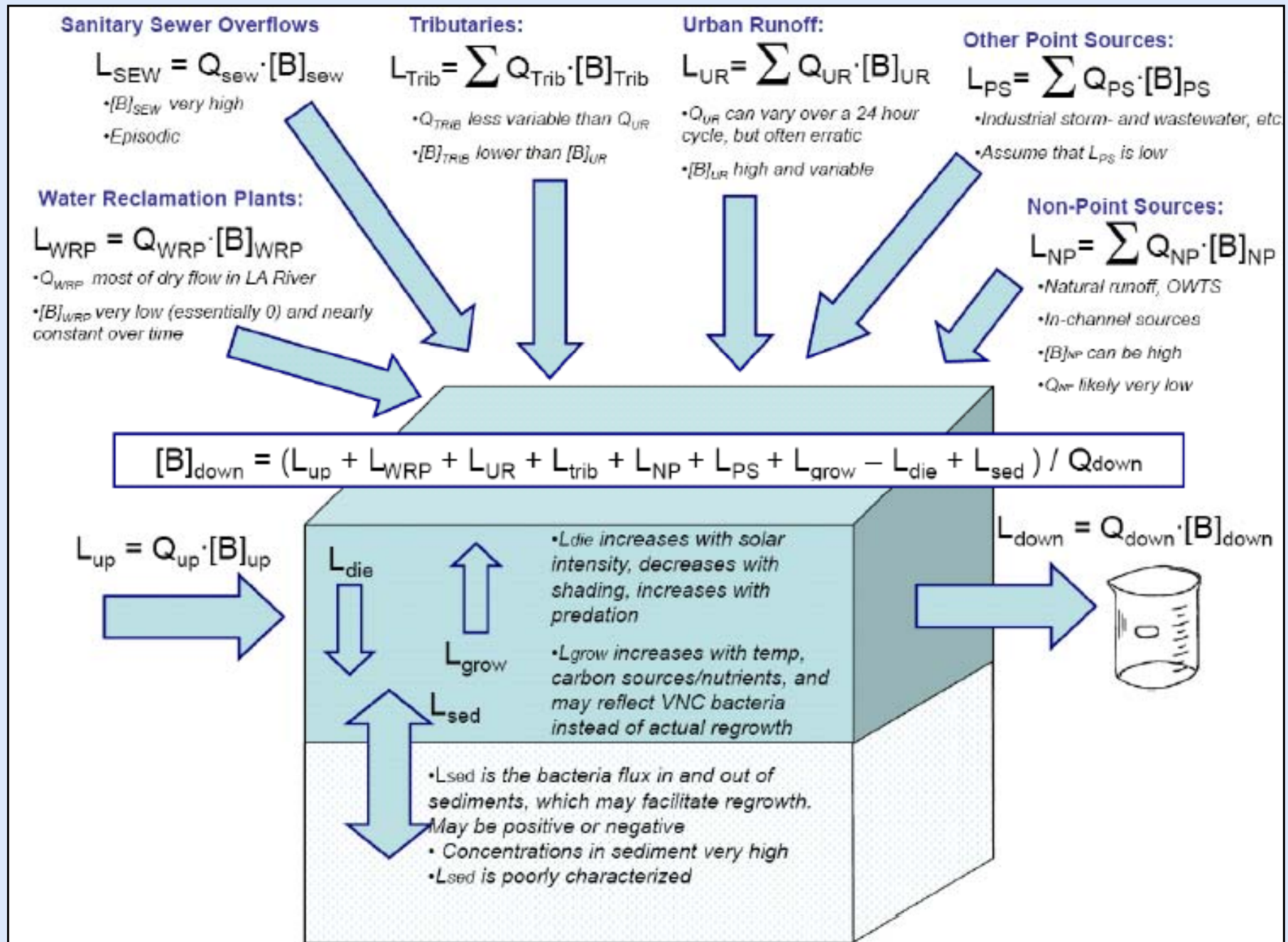


Figure 3. Conceptual Model of Dry Weather Bacteria Fate and Transport in the LA River

Appendix Section 3

3	Data Compilation and Analysis Methods	13
3.1	Datasets used for Source Assessment	13
3.2	Categorization of Water Quality Data.....	17
3.3	Statistical Methods for Quantitative Source Assessment.....	19
3.3.1	Handling of Non-Detect Data	19
3.3.2	Calculation of Loading Rates.....	20
3.3.3	Plots.....	20
3.3.4	Statistical Differences Among Sites	20
3.3.5	Correlations among Parameters	21

Table 3. Datasets compiled for the LA River Bacteria TMDL Database and analyzed during this Source Assessment

Site Types	Agency/Organization	# of Sites	Date Range	Number of Samples in Database											
				E. coli	Enterococcus	Fecal Coliform	Total Coliform	Streptococcus	Human Bacteroidales	Universal Bacteroidales	Adenovirus 40/41	Conductivity	Total Suspended Solids	Turbidity	
Receiving Waters	Burbank WRP	5	1991-2005	0	0	0	2238	0	0	0	0	0	0	61	
	LA Glendale WRP	4	1991-2005	0	0	1313	1363	0	0	0	0	0	0	108	
	Tillman WRP	21	1997-2005	0	0	1653	6106	0	0	0	0	0	331	87	
Sources and Receiving Waters	CREST – BSI Study	116	2007-2007	473	473	0	0	0	466	466	617	0	445	204	
	CREST – Tier 2 Study	20	2006-2006	120	120	119	120	0	0	0	0	120	120	120	
Receiving Waters	City of Los Angeles Watershed Protection Division – Status and Trends Program	18	2001-2008	2853	2836	0	2858	0	0	0	0	0	0	0	
	Los Angeles County Department of Public Works MS4 NPDES Monitoring	9	1997-2007	40	70	99	109	69	0	0	0	94	44	44	
	Southern California Marine Institute	46	1998-2006	190	147	0	190	0	0	0	0	3	0	103	
Sources and Receiving Waters	Southern California Coastal Water Research Program (SCCWRP)	Reference Stream Fecal Indicator Bacteria (FIB) Study	15	2006-2007	645	646	10	645	0	0	0	0	649	0	136
		Land Use Pollutant Loadings Study	28	2001-2005	50	785	735	785	0	0	0	0	0	652	0
		Natural Landscapes Study	22	2004-2006	63	62	0	63	0	0	0	0	0	0	0
		Reference Beaches Study	6	2004-2005	60	60	0	59	0	0	0	0	0	0	0
		Snapshot Study	104	2000-2001	151	151	0	151	0	0	0	0	0	85	0
Total				4645	5350	3929	14687	69	466	466	617	866	1667	863	

CATEGORIZATION

- WET vs DRY
- HFS vs NON-HFS
- STORM vs NON-STORM

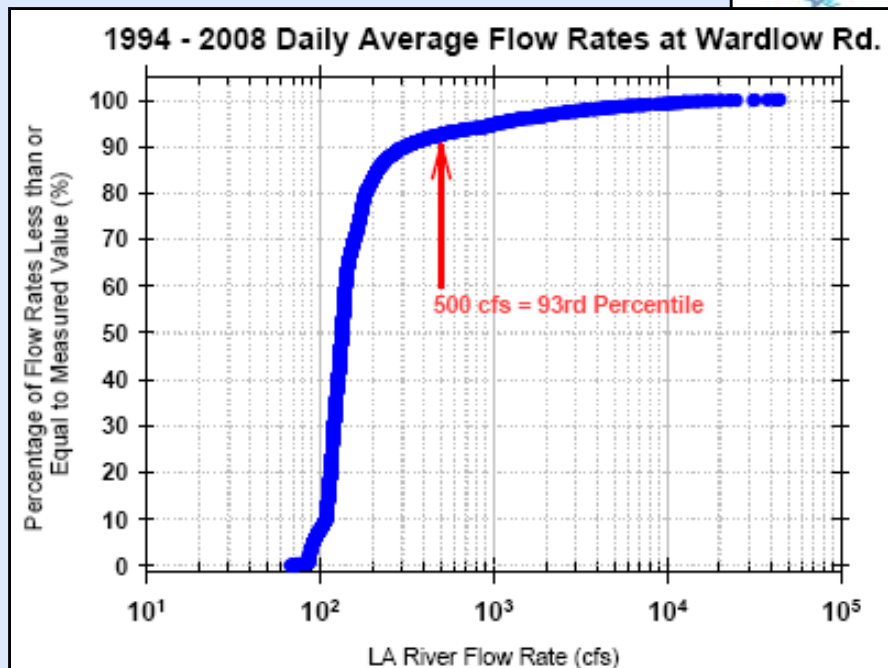
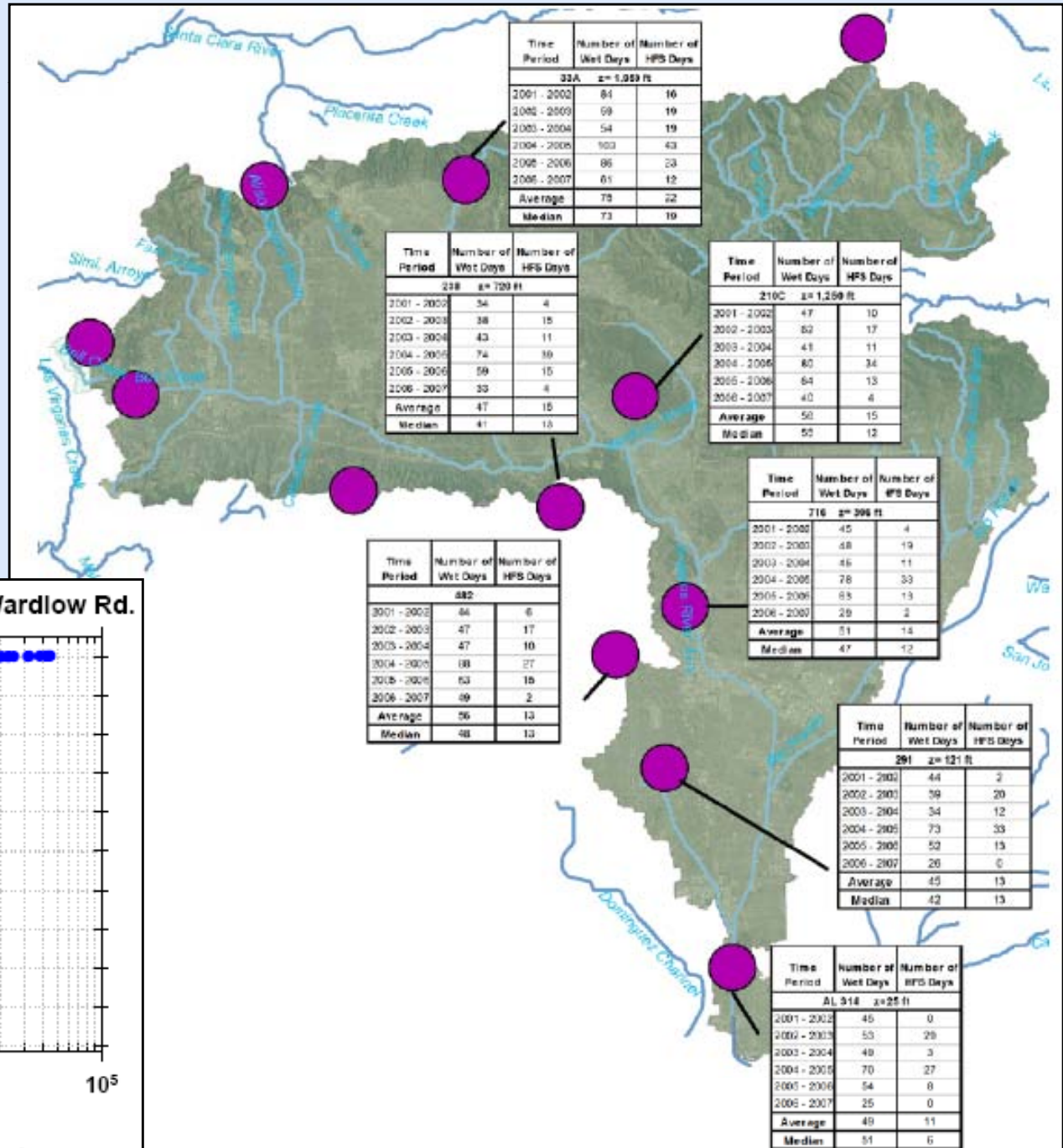
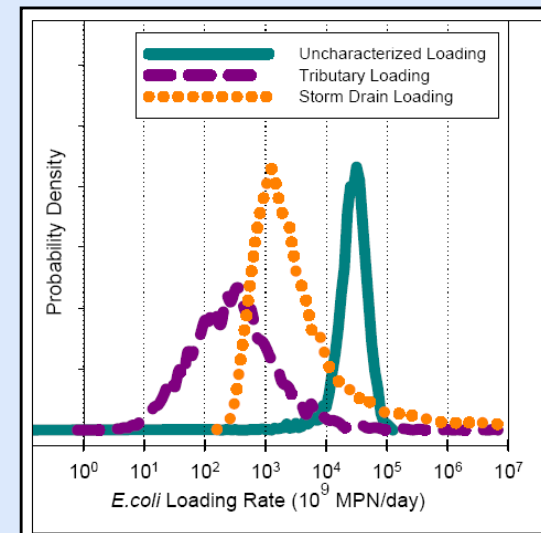
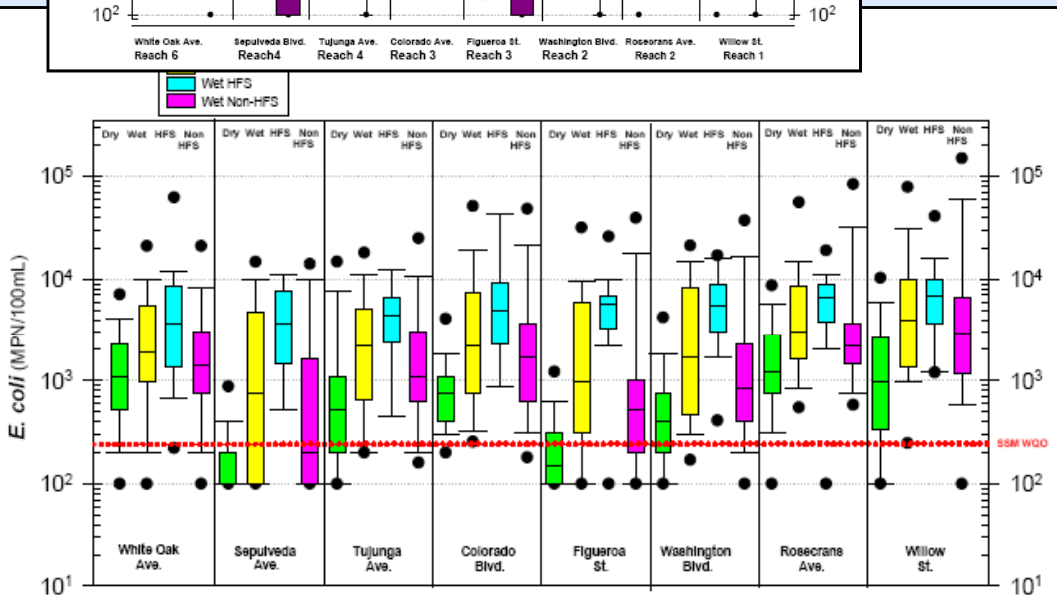
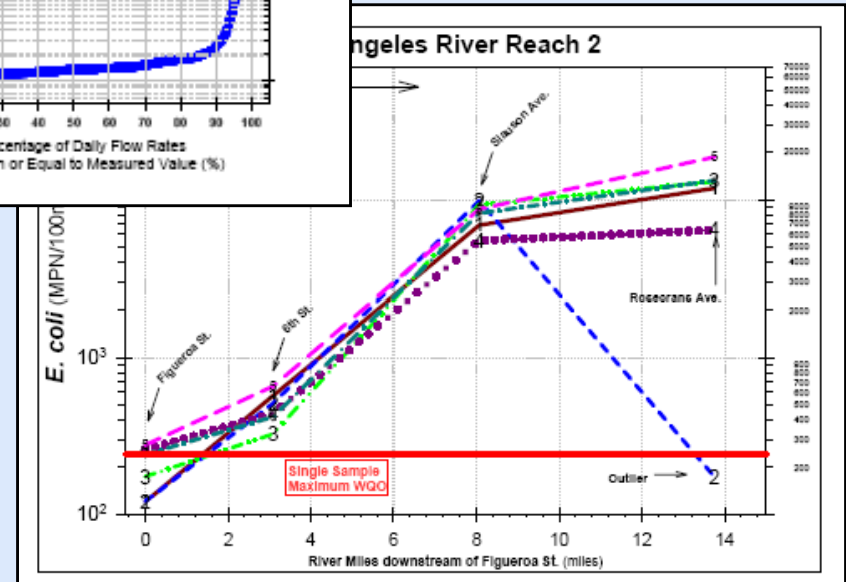
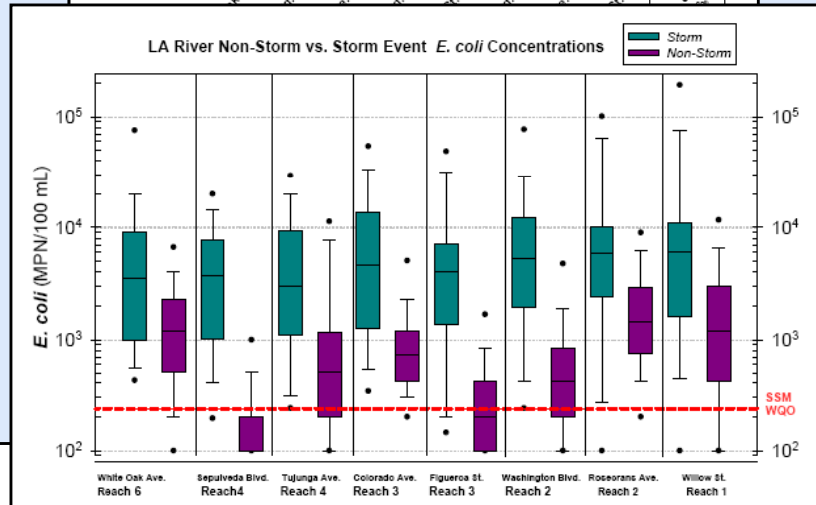
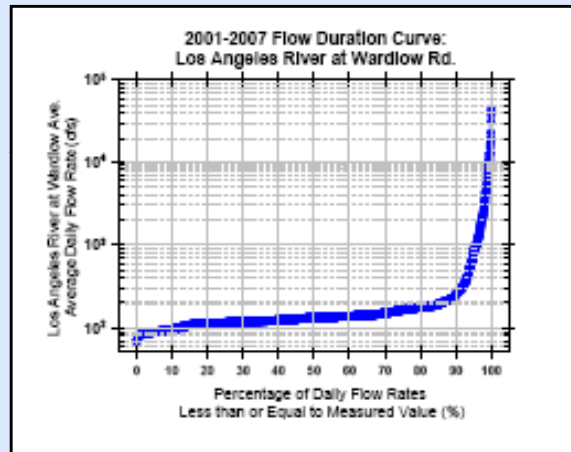
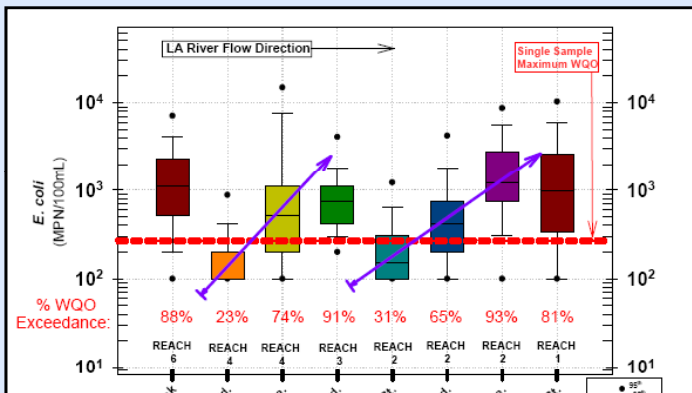


Figure 7. Flow Duration Curve for the LA River at Wardlow Road and 500 cfs Cutoff used for Storm/Non-storm Categorization in the LA River Bacteria TMDL Database

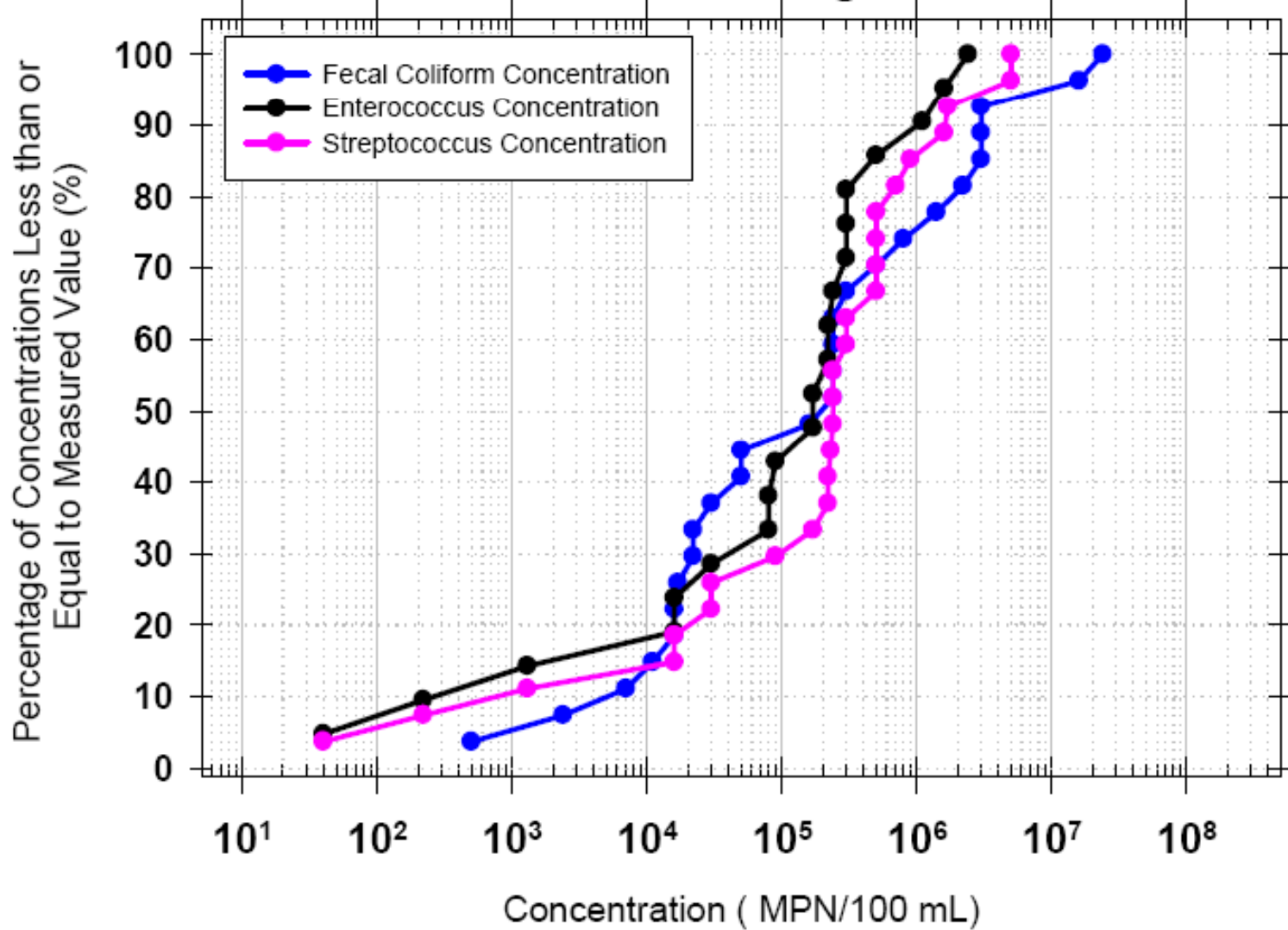
Figure 6. 2001-2007 Rainfall Analysis for LACoDPW Gages in the Watershed

Appendix Section 4

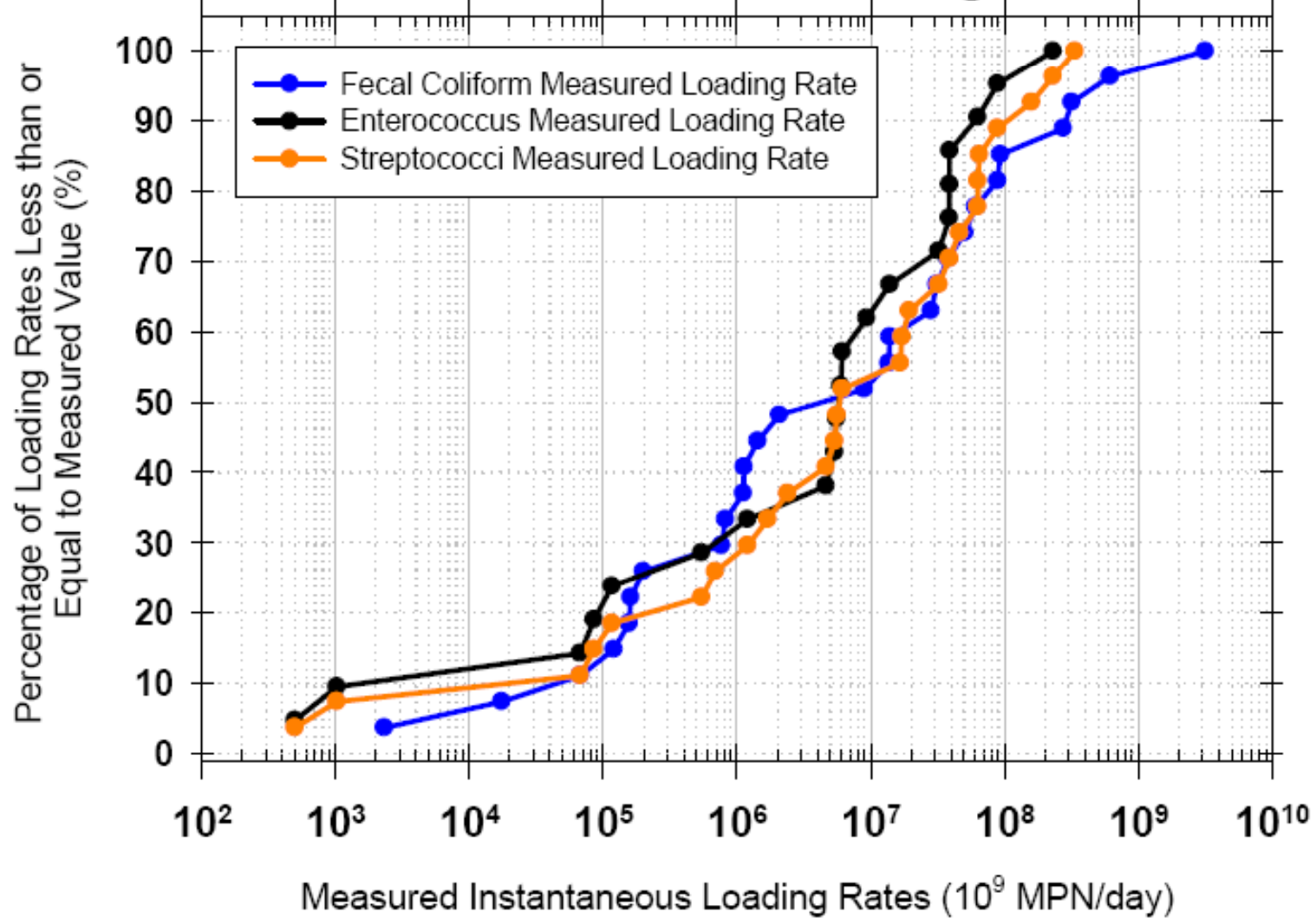
4	Assessment of the LA River and its Tributaries	22
4.1	Mainstem LA River.....	24
4.1.1	Flow Rates	24
4.1.2	Dry Weather Conditions	27
4.1.3	Wet Weather Conditions.....	38
4.2	Tributaries to the LA River.....	55
4.2.1	Tributary Flow Rates	56
4.2.2	Bacteria Concentrations in Tributaries	58
4.2.3	Intra-Storm Variability in Tributaries.....	64



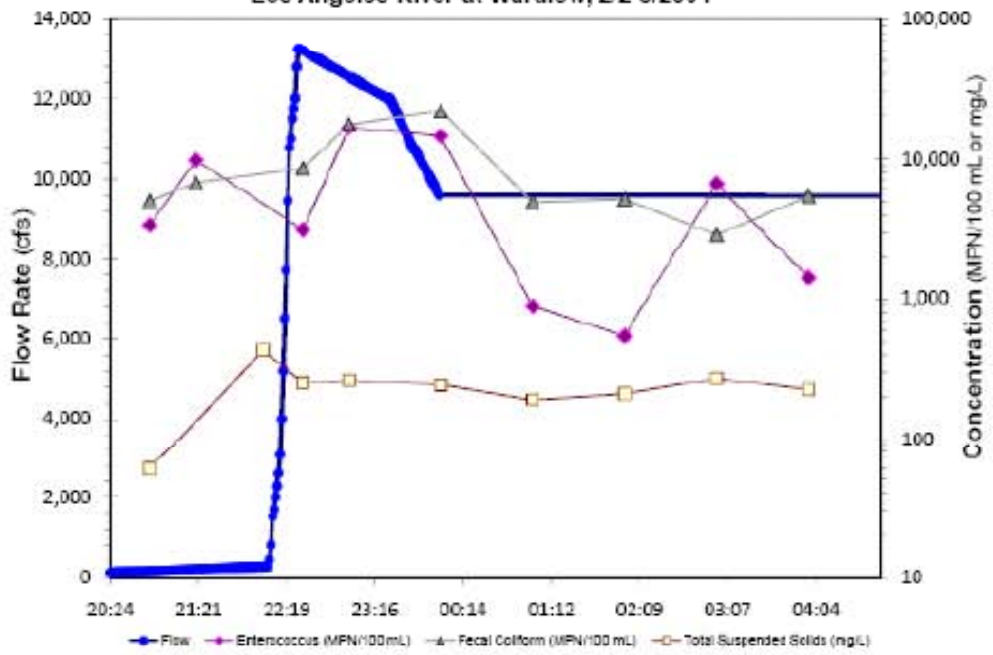
Bacteria Concentrations at LA River at Wardlow Road during Storm Events



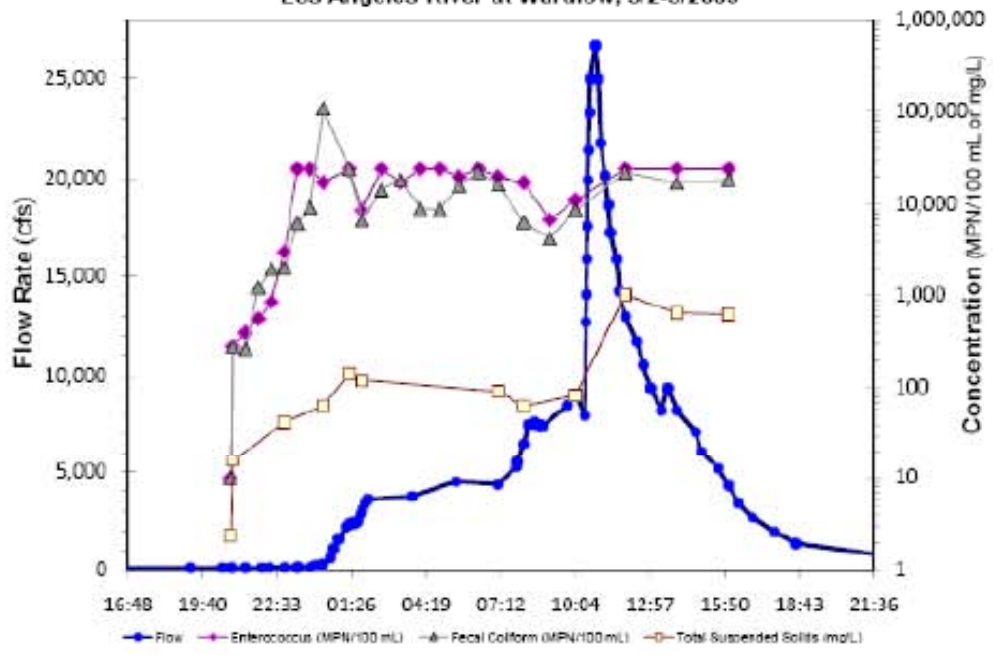
Measured Instantaneous Loading Rates at LA River at Wardlow Road during Storm Events



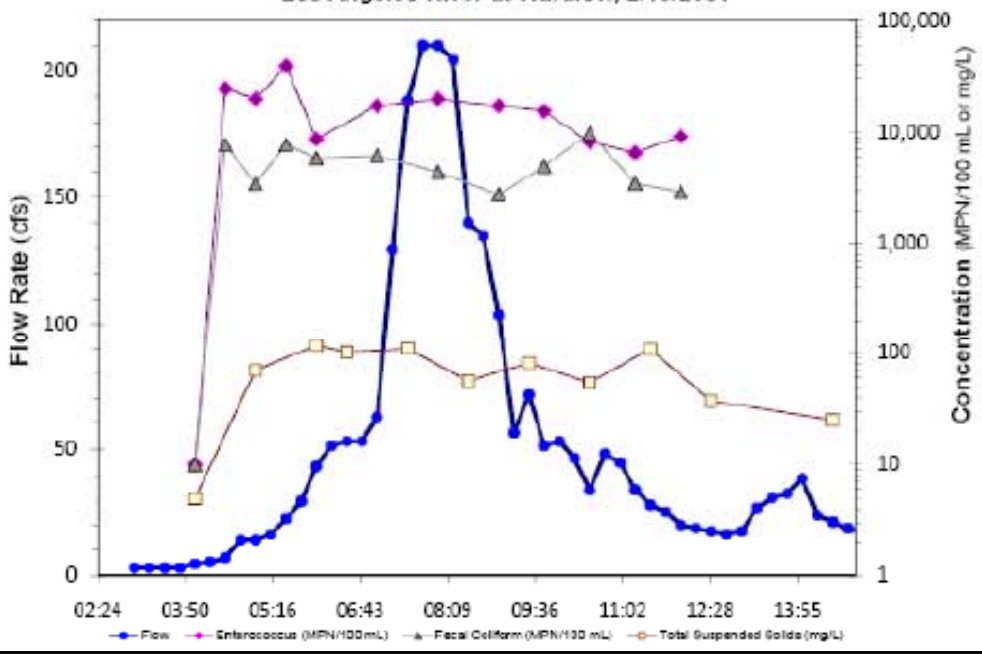
Los Angeles River at Wardlow, 2/2-3/2004



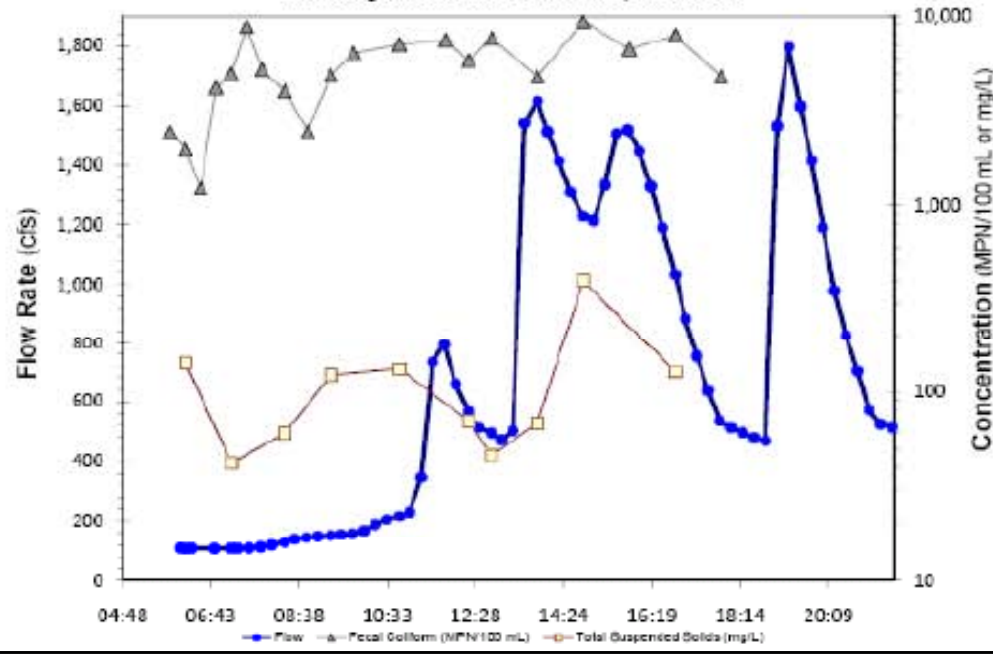
Los Angeles River at Wardlow, 5/2-3/2003



Los Angeles River at Wardlow, 2/10/2001



Los Angeles River at Wardlow, 1/26/2001



Appendix Section 5

5	Wastewater Sources.....	68
5.1	Municipal Wastewater.....	68
5.1.1	Overview of WRPs in the Watershed	68
5.1.2	Tertiary-treated, Disinfected Effluent Discharges	70
5.1.3	Discharges from Wastewater Collection Systems	74
5.1.4	Non-SSO Municipal Wastewater Influences and IDIC Programs.....	87
5.2	Onsite Wastewater Treatment Systems.....	87
5.3	Industrial Wastewater.....	89

Appendix Section 6

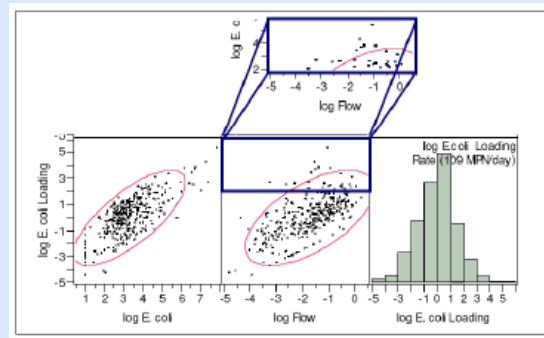
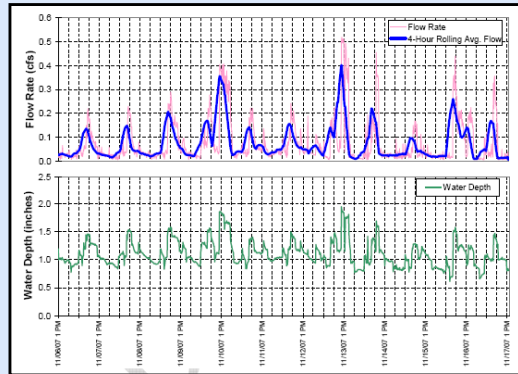
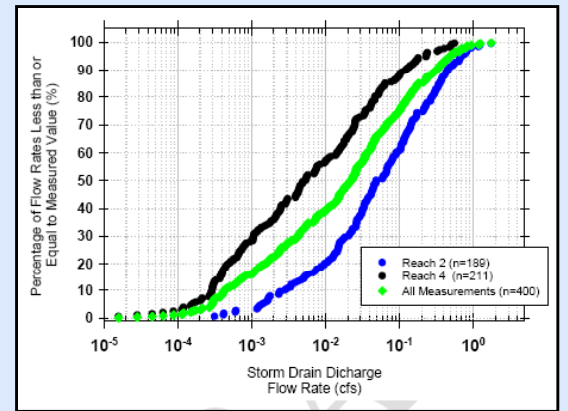
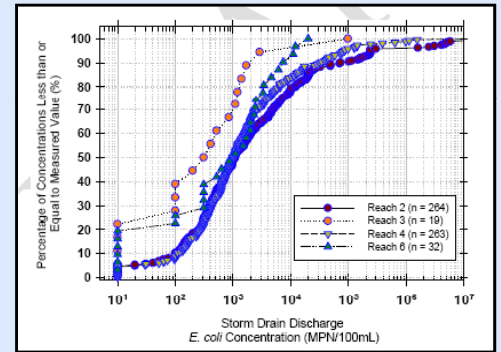
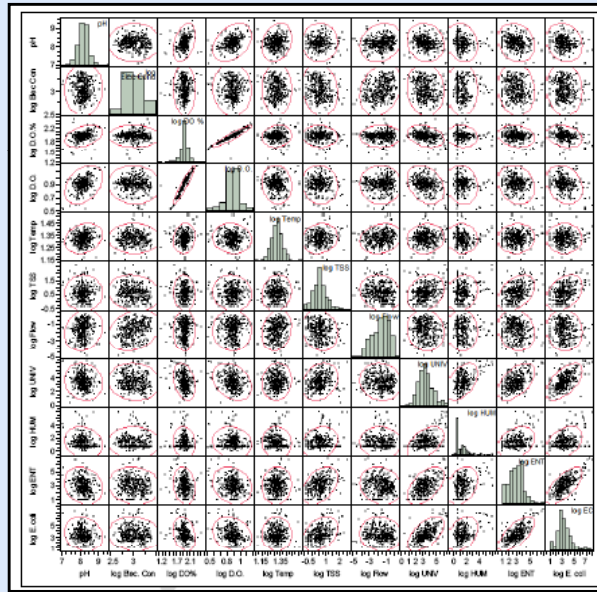
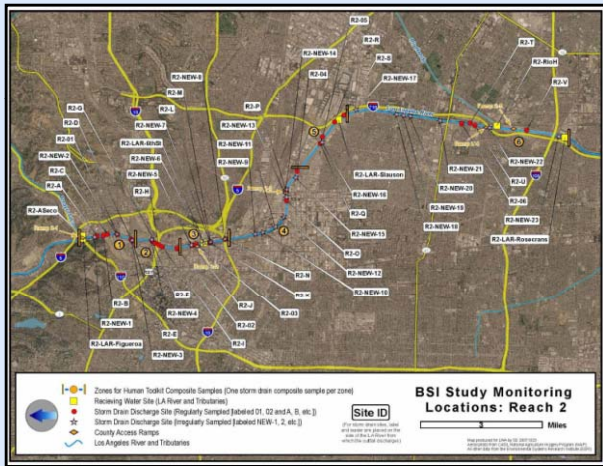
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6.3	Food Waste and Trash	96
6.4	Equestrian Activities	96
6.5	Wildlife	100
6.5.1	Birds	100
6.5.2	Other Wildlife	103
6.6	Natural/Reference Conditions	103

Appendix Section 7

7	Non-Wastewater and Non-Stormwater Permitted Sources.....	112
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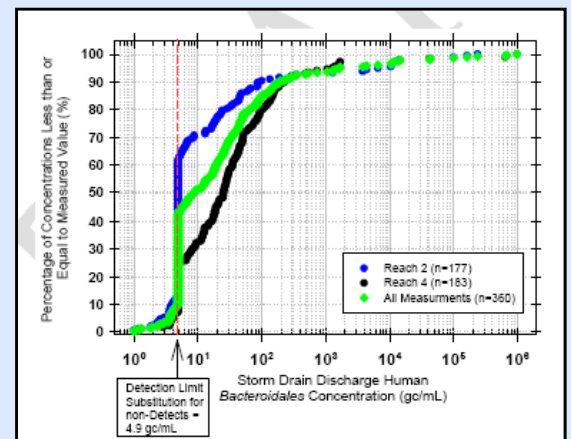
Appendix Section 8

8	Urban Runoff	113
8.1	Industrial Stormwater	113
8.2	Runoff from Construction Activity	115
8.3	Municipal Separate Storm Sewer Systems.....	115
8.3.1	NPDES MS4 Permits in the Watershed.....	116
8.3.2	Dry Weather Storm Drain Discharges	117
8.3.3	Wet Weather Urban Runoff.....	156



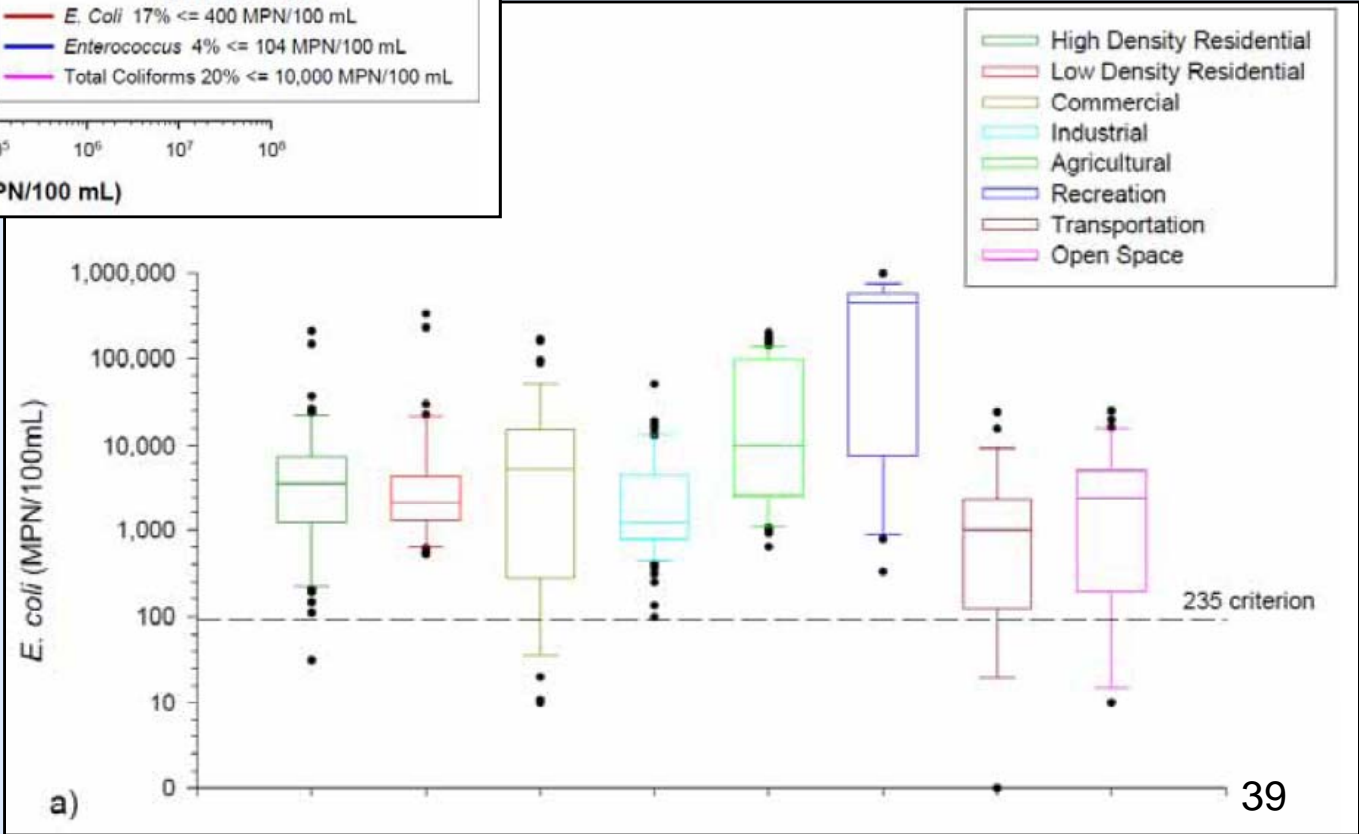
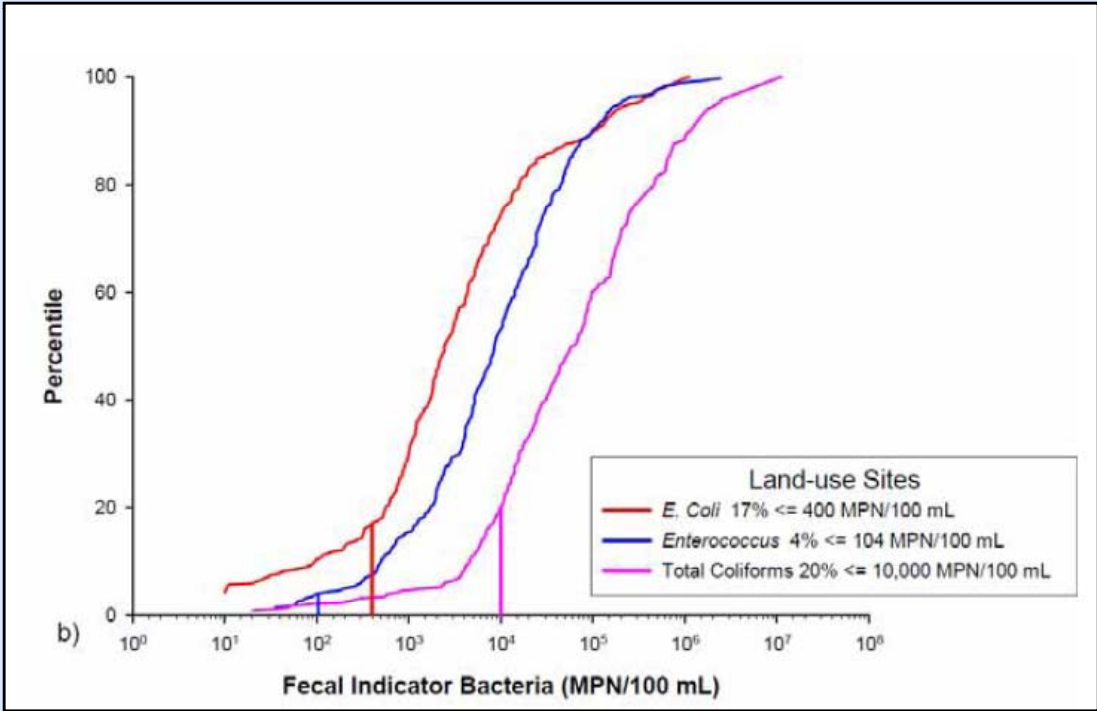
ELEVATED LOADING RATES			ELEVATED CONCENTRATIONS		
DIFFERENT	CONSISTENT	RARE	DIFFERENT	CONSISTENT	RARE
Statistically Higher	Top 5 Drain at least 3 of 6 Events	Loading Rate >50% of Event Total at Least Once	Statistically Higher (Dist = 1 Positive)	>90th Percentile Concentration at least 2 of 6 Events (Dist = 2 Positive)	99th Percentile Concentrations (Dist = 1 Positive)
R4-A	R4-A R4-01 R4-C R4-F R4-G R4-04	R4-C	R4-A	R4-F R4-H R4-NEW-22 R4-X	R4-NEW-5 R4-X
				R4-D	R4-01 R4-F R4-I R4-J R4-L R4-O R4-R R4-T R4-V R4-Y
				R4-C R4-02 R4-03 R4-G R4-04	R4-F R4-X
				R4-A R4-B R4-F	R4-B R4-F
				R4-A R4-F	R4-B R4-F

Study Area	Adenovirus 40/41 Detections at Storm Drain Outfalls	
	4-liter	200-mL
Reach 2	7 of 42 (17%)	4 of 183 (2%)
Reach 4	1 of 36 (3%)	17 of 177 (10%)
Total	8 of 78 (10%)	21 of 360 (6%)



Dry Weather

Wet Weather



Appendix Section 9: References

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Summary

- Source assessment will assist with Allocation development and implementation planning
- Compiled all major datasets collected within LAR watershed, including receiving water
- Summarize current conditions, array of potential sources and our conceptual models
- Convey the complexity of the bacteria impairment
- **CREST's first section of the TMDL!**