Appendix S

Responses to Comments

For Bacteria TMDLs Project I
Adopted by the San Diego Water Board on
December 12, 2007

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Table of Contents

1 List of Persons Submitting Comments 1
2 Comment Numbers and Categories 2
3 Introduction 10
4 Additional Information Requested by the San Diego Water Board 10
4.1 Load Reductions Required for Discharger Categories and Recalculation of Allocations 10
4.2 Cost Estimates for Virus Surface Water Monitoring 10
4.3 Adaptability of TMDLs and Compliance Schedules Based on New Data or Information 12
4.4 Addressing Beaches and Creeks Simultaneously 13
4.5 Nurseries as a Potential Bacteria Source 15
5 Comments and Responses 16
5.1 Reference System Approach Basin Plan Amendment 16
5.2 Technical Analysis 34
5.3 Water Quality Objectives/Indicator Bacteria 87
5.4 Beneficial Uses 95
5.5 Implementation Plan/Compliance Assessment 116
5.6 Compliance Schedule 147
5.7 Environmental Analysis 159
5.8 Economics 192

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1 List of Persons Submitting Comments

The following persons submitted comments on one or more of the versions of the Total Maximum Daily Loads (TMDLs) for Indicator Bacteria Project I—Beaches and Creeks in the San Diego Region. The table in section 2, below, links the commenter with the comment number, and version of the TMDL documents on which the comment was made.

- California Department of Transportation
- City of Dana Point
- City of Encinitas
- City of Laguna Beach
- City of Laguna Niguel
- City of Oceanside
- City of Poway
- City of San Diego
- County of Orange
- County of San Diego
- Department of the Navy
- San Diego Coastkeeper
- San Diego Farm Bureau
- Sierra Club
- U.S. Environmental Protection Agency
- Heal The Bay

2 Comment Numbers and Categories

Section	Comment Number	Commenter	Version of Technical Report	Page Number
5.1 Reference System Approach Basin Plan Amendment				
5.1	1	California Department of Transportation	December 9, 2005	16
5.1	2	City of Laguna Beach	December 9, 2005	16
5.1	3	City of Oceanside	December 9, 2005	18
5.1	4	Cities of Encinitas and Laguna Niguel	December 9, 2005	19
5.1	5	City of San Diego	December 9, 2005	20
5.1	6	County of San Diego	December 9, 2005	20
5.1	7	City of San Diego	December 9, 2005	20
5.1	8	County of Orange	December 9, 2005	21
5.1	9	County of Orange	December 9, 2005	22
5.1	10	County of Orange	December 9, 2005	23
5.1	11	City of San Diego	March 9, 2007	24
5.1	12	City of San Diego	March 9, 2007	26
5.1	13	City of Laguna Niguel	March 9, 2007	26
5.1	14	City of Laguna Niguel	March 9, 2007	27
5.1	15	City of Laguna Niguel	March 9, 2007	28
5.1	16	City of Dana Point	March 9, 2007	28
5.1	17	County of Orange	March 9, 2007	29
5.1	18	Department of the Navy	March 9, 2007	30
5.1	19	Department of the Navy	March 9, 2007	30
5.1	20	San Diego County Farm Bureau	March 9, 2007	31
5.1	21	San Diego Coastkeeper	March 9, 2007	31
5.1	22	Heal the Bay	March 9, 2007	32
5.2 Technical Analysis				
5.2	23	Stakeholder Advisory Group	December 9, 2005	34
5.2	24	City of San Diego, County of San Diego	December 9, 2005	35
5.2	25	County of Orange	December 9, 2005	35
5.2	26	Sierra Club	December 9, 2005	35
5.2	27	San Diego Coastkeeper	December 9, 2005	36
5.2	28	California Department of Transportation	December 9, 2005	36
5.2	29	City of San Diego	December 9, 2005	38
5.2	30	San Diego Coastkeeper	December 9, 2005	38
5.2	31	County of Orange	December 9, 2005	38
5.2	32	County of Orange	December 9, 2005	39
5.2	33	County of Orange	December 9, 2005	39
5.2	34	County of Orange	December 9, 2005	42
5.2	35	County of Orange	December 9, 2005	43
5.2	36	County of Orange	December 9, 2005	45
5.2	37	County of Orange	December 9, 2005	45
5.2	38	County of Orange	December 9, 2005	45

Section	Comment Number	Commenter	Version of Technical Report	Page Number
5.2 Technical Analysis (Cont'd)				
5.2	39	County of Orange	December 9, 2005	46
5.2	40	County of Orange	December 9, 2005	47
5.2	41	County of Orange	December 9, 2005	47
5.2	42	County of Orange	December 9, 2005	48
5.2	43	County of Orange	December 9, 2005	49
5.2	44	County of Orange	December 9, 2005	50
5.2	45	County of Orange	December 9, 2005	51
5.2	46	County of Orange	December 9, 2005	52
5.2	47	County of Orange	December 9, 2005	52
5.2	48	County of Orange	December 9, 2005	53
5.2	49	County of San Diego	December 9, 2005	53
5.2	50	Sierra Club	December 9, 2005	53
5.2	51	Sierra Club	December 9, 2005	54
5.2	52	Sierra Club	December 9, 2005	54
5.2	53	Sierra Club	December 9, 2005	55
5.2	54	Sierra Club	December 9, 2005	56
5.2	55	Sierra Club	December 9, 2005	57
5.2	56	Sierra Club	December 9, 2005	57
5.2	57	U.S. Environmental Protection Agency	December 9, 2005	57
5.2	58	City of Laguna Niguel	August 4, 2006	57
5.2	59	City of Dana Point	August 4, 2006	60
5.2	60	City of Dana Point	August 4, 2006	60
5.2	61	City of Dana Point	August 4, 2006	60
5.2	62	City of Dana Point	August 4, 2006	60
5.2	63	City of Encinitas	August 4, 2006	61
5.2	64	City of Encinitas	August 4, 2006	61
5.2	65	City of Encinitas	August 4, 2006	62
5.2	66	City of Encinitas	August 4, 2006	62
5.2	67	City of Encinitas	August 4, 2006	63
5.2	68	City of Encinitas	August 4, 2006	64
5.2	69	City of Encinitas	August 4, 2006	64
5.2	70	City of Encinitas	August 4, 2006	65
5.2	71	City of Encinitas	August 4, 2006	66
5.2	72	City of Encinitas	August 4, 2006	66
5.2	73	City of Encinitas	August 4, 2006	67
5.2	74	City of Encinitas	August 4, 2006	68
5.2	75	City of Encinitas	August 4, 2006	68
5.2	76	City of Encinitas	August 4, 2006	69
5.2	77	City of Encinitas	August 4, 2006	69
5.2	78	City of Encinitas	August 4, 2006	69

Section	Comment Number	Commenter	Version of Technical Report	Page Number
5.2 Technical Analysis (Cont'd)				
5.2	79	City of Encinitas	August 4, 2006	71
5.2	80	City of Encinitas	August 4, 2006	73
5.2	81	City of San Diego	August 4, 2006	74
5.2	82	City of San Diego	August 4, 2006	75
5.2	83	City of San Diego	August 4, 2006	77
5.2	84	City of San Diego	August 4, 2006	78
5.2	85	City of San Diego	August 4, 2006	79
5.2	86	City of San Diego	August 4, 2006	79
5.2	87	City of San Diego	August 4, 2006	79
5.2	88	City of San Diego	August 4, 2006	79
5.2	89	City of San Diego	August 4, 2006	79
5.2	90	County of Orange	August 4, 2006	80
5.2	91	Sierra Club	March 9, 2007	80
5.2	92	Sierra Club	March 9, 2007	81
5.2	93	City of Laguna Niguel, City of Dana Point	March 9, 2007	81
5.2	94	City of Laguna Niguel	March 9, 2007	82
5.2	95	City of Dana Point	March 9, 2007	82
5.2	96	County of Orange	March 9, 2007	83
5.2	97	County of Orange	March 9, 2007	83
5.2	98	California Department of Transportation	March 9, 2007	83
5.2	99	California Department of Transportation	March 9, 2007	85
5.2	100	Department of the Navy	March 9, 2007	85
5.2	101	Department of the Navy	March 9, 2007	86
5.2	102	Heal the Bay	March 9, 2007	86
5.3 Water Quality Objectives / Indicator Bacteria				
5.3	103	Cities of Encinitas and Laguna Niguel	December 9, 2005	87
5.3	104	County of Orange	December 9, 2005	87
5.3	105	County of Orange	December 9, 2005	88
5.3	106	County of Orange	December 9, 2005	88
5.3	107	County of Orange	December 9, 2005	88
5.3	108	City of Dana Point	August 4, 2006	89
5.3	109	City of San Diego	August 4, 2006	90
5.3	110	City of Laguna Niguel	March 9, 2007	90
5.3	111	Heal the Bay	March 9, 2007	90
5.3	112	County of Orange	March 9, 2007	91
5.3	113	County of Orange	March 9, 2007	92
5.3	114	Department of the Navy	March 9, 2007	92
5.3	115	Department of the Navy	March 9, 2007	93
5.3	116	San Diego County Farm Bureau	March 9, 2007	93

Section	Comment Number	Commenter	Version of Technical Report	Page Number
5.4 Beneficial Uses				
5.4	117	City of Laguna Beach	December 9, 2005	95
5.4	118	Cities of Encinitas and Laguna Niguel	December 9, 2005	95
5.4	119	City of San Diego, County of Orange	December 9, 2005	97
5.4	120	City of Oceanside	December 9, 2005	98
5.4	121	Cities of Encinitas and Laguna Niguel	December 9, 2005	99
5.4	122	County of Orange and County of San Diego	December 9, 2005	99
5.4	123	Cities of Encinitas and Laguna Niguel	December 9, 2005	100
5.4	124	County of Orange	December 9, 2005	100
5.4	125	City of San Diego	December 9, 2005	101
5.4	126	County of Orange	December 9, 2005	101
5.4	127	County of San Diego	December 9, 2005	102
5.4	129	City of Laguna Niguel	August 4, 2006	103
5.4	130	City of Laguna Niguel	August 4, 2006	104
5.4	131	City of San Diego	August 4, 2006	106
5.4	132	County of Orange	August 4, 2006	107
5.4	133	County of San Diego	August 4, 2006	108
5.4	134	County of San Diego	August 4, 2006	109
5.4	135	City of San Diego	March 9, 2007	109
5.4	136	City of Laguna Niguel	March 9, 2007	110
5.4	137	City of Dana Point	March 9, 2007	110
5.4	138	County of Orange	March 9, 2007	111
5.4	139	County of Orange	March 9, 2007	111
5.4	140	County of Orange	March 9, 2007	112
5.4	141	Department of the Navy	March 9, 2007	112
5.4	142	Department of the Navy	March 9, 2007	113
5.4	143	Department of the Navy	March 9, 2007	114
5.4	144	Department of the Navy	March 9, 2007	114
5.4	145	City of Laguna Beach	March 9, 2007	114
5.4	146	San Diego Coastkeeper	March 9, 2007	115
5.5 Implementation Plan / Compliance Assessment				
5.5	147	Stakeholder Advisory Group	December 9, 2005	116
5.5	148	Stakeholder Advisory Group	December 9, 2005	117
5.5	149	Stakeholder Advisory Group	December 9, 2005	118
5.5	150	Stakeholder Advisory Group	December 9, 2005	118
5.5	151	City of Laguna Beach	December 9, 2005	119
5.5	152	City of Laguna Beach	December 9, 2005	119
5.5	153	City of San Diego	December 9, 2005	120
5.5	154	City of San Diego	December 9, 2005	120
5.5	155	City of San Diego	December 9, 2005	121

Section	Comment Number	Commenter	Version of Technical Report	Page Number
5.5 Implementation Plan / Compliance Assessment (Cont'd)				
5.5	156	City of San Diego	December 9, 2005	121
5.5	157	County of Orange	December 9, 2005	122
5.5	158	County of Orange	December 9, 2005	122
5.5	159	County of San Diego	December 9, 2005	122
5.5	160	Sierra Club	December 9, 2005	123
5.5	161	City of Laguna Niguel	August 4, 2006	123
5.5	162	City of Laguna Niguel	August 4, 2006	124
5.5	163	City of El Cajon	August 4, 2006	125
5.5	164	City of El Cajon	August 4, 2006	125
5.5	165	City of Dana Point	August 4, 2006	126
5.5	166	City of San Diego	August 4, 2006	126
5.5	167	City of San Diego	August 4, 2006	127
5.5	168	City of San Diego	August 4, 2006	127
5.5	169	City of San Diego	August 4, 2006	127
5.5	170	County of Orange	August 4, 2006	128
5.5	171	County of Orange	August 4, 2006	131
5.5	172	County of Orange	August 4, 2006	131
5.5	173	County of Orange	March 9, 2007	133
5.5	174	City of Del Mar	August 4, 2006	133
5.5	175	City of Del Mar	August 4, 2006	134
5.5	176	County of San Diego	August 4, 2006	135
5.5	177	City of San Diego	March 9, 2007	135
5.5	178	City of San Diego	March 9, 2007	136
5.5	179	City of San Diego	March 9, 2007	136
5.5	180	City of San Diego	March 9, 2007	137
5.5	181	City of San Diego	March 9, 2007	137
5.5	182	City of San Diego	March 9, 2007	137
5.5	183	City of San Diego	March 9, 2007	137
5.5	184	City of San Diego	March 9, 2007	137
5.5	185	City of San Diego	March 9, 2007	138
5.5	186	City of San Diego	March 9, 2007	138
5.5	187	City of San Diego	March 9, 2007	138
5.5	188	City of San Diego	March 9, 2007	138
5.5	189	City of Laguna Niguel	March 9, 2007	138
5.5	190	City of Laguna Niguel	March 9, 2007	139
5.5	191	City of Laguna Niguel	March 9, 2007	139
5.5	192	City of Del Mar	March 9, 2007	139
5.5	193	City of Del Mar	March 9, 2007	140
5.5	194	City of Del Mar	March 9, 2007	140
5.5	195	City of Del Mar	March 9, 2007	140
5.5	196	City of Del Mar	March 9, 2007	141

Section	Comment Number	Commenter	Version of Technical Report	Page Number
5.5 Implementation Plan / Compliance Assessment (Cont'd)				
5.5	197	City of Dana Point	March 9, 2007	141
5.5	198	Department of the Navy	March 9, 2007	142
5.5	199	Department of the Navy	March 9, 2007	142
5.5	200	City of Poway	March 9, 2007	142
5.5	201	City of Laguna Beach	March 9, 2007	142
5.5	202	City of Laguna Beach	March 9, 2007	143
5.5	203	City of Laguna Beach	March 9, 2007	143
5.5	204	City of Laguna Beach	March 9, 2007	143
5.5	205	San Diego County Farm Bureau	March 9, 2007	143
5.5	206	San Diego County Farm Bureau	March 9, 2007	144
5.5	207	San Diego Coastkeeper	March 9, 2007	144
5.5	208	Heal the Bay	March 9, 2007	145
5.6 Compliance Schedule				
5.6	209	City of Laguna Beach	December 9, 2005	147
5.6	210	City of San Diego and County of San Diego	December 9, 2005, August 4, 2006	148
5.6	211	Cities of Encinitas and Laguna Niguel	December 9, 2005	148
5.6	212	City of San Diego and County of San Diego	December 9, 2005, August 4, 2006	149
5.6	213	City of Laguna Niguel	August 4, 2006	149
5.6	214	City of San Diego	August 4, 2006	150
5.6	215	City of San Diego	August 4, 2006	151
5.6	216	County of Orange	August 4, 2006	151
5.6	217	City of San Diego	March 9, 2007	155
5.6	218	City of Laguna Niguel	March 9, 2007	155
5.6	219	City of Laguna Niguel	March 9, 2007	156
5.6	220	County of Orange	March 9, 2007	156
5.6	221	San Diego Coastkeeper	March 9, 2007	156
5.6	222	Heal the Bay	March 9, 2007	157
5.7 Environmental Analysis				
5.7	223	Cities of Encinitas and Laguna Niguel	December 9, 2005	159
5.7	224	City of Oceanside	December 9, 2005	159
5.7	225	City of San Diego	December 9, 2005	160
5.7	226	City of San Diego	December 9, 2005	160
5.7	227	City of San Diego	December 9, 2005, August 4, 2006	160
5.7	228	City of San Diego	December 9, 2005	161
5.7	229	City of San Diego	December 9, 2005	161
5.7	230	City of San Diego	August 4, 2006	162
5.7	231	City of San Diego	August 4, 2006	162

Section	Comment Number	Commenter	Version of Technical Report	Page Number
5.7 Environmental Analysis (Cont'd)				
5.7	232	City of San Diego	August 4, 2006, March 9, 2007	163
5.7	233	City of San Diego	August 4, 2006, March 9, 2007	164
5.7	234	City of San Diego	August 4, 2006, March 9, 2007	166
5.7	235	City of San Diego	August 4, 2006, March 9, 2007	168
5.7	236	City of San Diego	August 4, 2006, March 9, 2007	168
5.7	237	City of San Diego	August 4, 2006, March 9, 2007	169
5.7	238	City of San Diego	August 4, 2006, March 9, 2007	170
5.7	239	City of San Diego	August 4, 2006, March 9, 2007	171
5.7	240	City of San Diego	August 4, 2006, March 9, 2007	172
5.7	241	City of San Diego	August 4, 2006, March 9, 2007	173
5.7	242	City of San Diego	August 4, 2006, March 9, 2007	173
5.7	243	City of San Diego	August 4, 2006, March 9, 2007	174
5.7	244	City of San Diego	August 4, 2006, March 9, 2007	174
5.7	245	City of San Diego	August 4, 2006, March 9, 2007	175
5.7	246	City of San Diego	August 4, 2006, March 9, 2007	178
5.7	247	City of San Diego	August 4, 2006, March 9, 2007	178
5.7	248	City of San Diego	August 4, 2006, March 9, 2007	178
5.7	249	City of San Diego	August 4, 2006, March 9, 2007	179
5.7	250	City of San Diego	August 4, 2006	179
5.7	251	City of San Diego	August 4, 2006	180
5.7	252	Sierra Club	March 9, 2007	180
5.7	253	City of San Diego	March 9, 2007	181
5.7	254	City of San Diego	March 9, 2007	181

Section	Comment Number	Commenter	Version of Technical Report	Page Number
5.7 Environmental Analysis (Cont'd)				
5.7	255	City of San Diego	March 9, 2007	182
5.7	256	City of San Diego	March 9, 2007	183
5.7	257	City of San Diego	March 9, 2007	183
5.7	258	City of San Diego	March 9, 2007	183
5.7	259	City of San Diego	March 9, 2007	184
5.7	260	City of San Diego	March 9, 2007	185
5.7	261	City of San Diego	March 9, 2007	185
5.7	262	City of San Diego	March 9, 2007	186
5.7	263	City of San Diego	March 9, 2007	186
5.7	264	City of San Diego	March 9, 2007	186
5.7	265	City of San Diego	March 9, 2007	187
5.7	266	City of San Diego	March 9, 2007	187
5.7	267	City of San Diego	March 9, 2007	188
5.7	268	City of San Diego	March 9, 2007	188
5.7	269	City of San Diego	March 9, 2007	189
5.7	270	City of San Diego	March 9, 2007	189
5.7	271	City of San Diego	March 9, 2007	189
5.7	272	City of San Diego	March 9, 2007	190
5.7	273	City of San Diego	March 9, 2007	190
5.7	274	City of Dana Point	March 9, 2007	190
5.8 Economics				
5.8	275	City of Laguna Beach	December 9, 2005	192
5.8	276	Cities of Encinitas and Laguna Niguel	December 9, 2005	192
5.8	277	City of Oceanside	December 9, 2005	193
5.8	278	City of San Diego	December 9, 2005	194
5.8	279	City of San Diego	December 9, 2005	194
5.8	280	County of Orange	December 9, 2005	196
5.8	281	County of Orange	December 9, 2005	196
5.8	282	City of Dana Point	March 9, 2007	198
5.8	283	City of Dana Point	March 9, 2007	198

3 Introduction

This report provides responses to public comments received on the Total Maximum Daily Loads (TMDLs) for Indicator Bacteria Project I—Beaches and Creeks in the San Diego Region. Draft TMDL documents distributed for public review and comment included the Technical Report, Resolution No. R9-2007-0044, and the Basin Plan amendment. The draft documents were made available to the public for formal review and comment for three comment periods, through the website of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) and at the San Diego Water Board office. The first public comment period opened December 9, 2005, and continued for 62 days. The second comment period opened August 4, 2006, and continued for 45 days. The third comment period opened March 9, 2007, and continued for 47 days.

The San Diego Water Board received many comments in testimony, letters, and emails from interested persons on the draft TMDL documents. The letters were not reproduced in this document. Individual comments were excerpted from the letters and testimony, and organized by subject. The comments are numbered sequentially in this report. Individual commenters are identified in the "List of Persons Submitting Comments" on page S-4 of this appendix.

Additional information requested by members of the San Diego Water Board is described in section 4 below. Individual comments and responses are discussed in section 5.

4 Additional Information Requested by the San Diego Water Board

4.1 Load Reductions Required for Discharger Categories and Recalculation of Allocations

Comment: At the December 14, 2005 meeting, Board Member Johnson commented that the percent reductions for wet weather discharges reported in the draft Technical Report were for all dischargers collectively in each watershed, thereby making it difficult to ascertain the percent reductions required from each discharger category (municipal MS4s, Caltrans, controllable nonpoint sources such as agriculture and animal facilities, and uncontrollable sources). He also noted that the watershed-wide load reduction percentages were misleading because they were smaller than the load reduction percentages for the individual discharger categories.

Response: We revised the tables in section 9 of the draft Technical Report to show the percent load reductions required for each of the discharger categories, instead of showing the percent reduction needed on a watershed-wide basis, as was reported previously.

4.2 Cost Estimates for Virus Surface Water Monitoring

Comment: At the February 8, 2006 meeting, Board Member Anderson requested information regarding cost estimates for monitoring pathogens.

Response: Pathogens are defined as agents that cause disease, and include microorganisms like bacteria, viruses, or fungi. In response to this comment, we

analyzed the costs associated with monitoring viruses, since this analysis has been done (although not widely used), and information is readily available.

Industry standards for virus detection are not available, and methods that have been used to date are expensive. However, expenses are expected to decrease significantly within the next few years due to new techniques that are being developed. Two types of viruses should be considered for water quality monitoring: the coliphages and human adenoviruses. Adenoviruses can cause large-scale epidemics of respiratory illness, however, they also are the second leading cause of gastroenteritis in children. Adenoviruses are consistently found in raw sewage throughout the world and are considered hardy, with a 2-log increase in population size in 99 days.[1]

Although adenoviruses were detected in the majority of samples collected from urban waterways and polluted coastal areas, one researcher reported that hepatitis A and enteroviruses were found in water samples where adenoviruses were absent. Therefore, the author concluded that adenoviruses alone cannot serve as an index for human viral contamination in Southern California.[2] Hence, two measurements of viral populations/ communities are provided in the present report. A quantitative test using polymerase chain reaction (PCR) techniques for one species of human adenovirus costs approximately $2,000/sample.[3]

Coliphages are viruses that infect Esherichia coli (E. coli) bacteria. Coliphages are found in high concentrations in sewage, with concentrations typically ranging from 100 to 10,000 infectious units per milliliter.[4]

A quantification technique for coliphages, applying traditional microbiological techniques, involves growing coliphages using E. coli concentrated on an agar medium. The water sample, which possibly contains coliphages, is then incubated in the agar plate.[5] The 28-day assay test is very expensive, approximately $1,500/sample. Conversely, a simple presence/absence test for coliphage costs between $50 to $100/sample, but provides limited information.[6]

Despite the possible high concentrations, viruses can be very difficult to isolate and usually require sampling large volumes of water (20 to 40 liters) quoted prices include concentration of viruses from the water samples, which can be time-intensive. Assuming that a two-person sampling team can collect samples at 5 sites per day, at 100 miles

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[1] Jiang, S., R. Noble and W. Chu. 2001.Human Adenoviruses and Coliphages in Urban Runoff-Impacted Coastal Waters of Southern California. *Applied and Environmental Microbiology* 67:1:179-184.

[2] Jiang, S. 2002. Adenovirus as an Index of Human Viral Contamination. Microbiological Source Tracking Workshop, February 5, 2002, Irvine, CA. National Water Research Institute, Fountain Valley, CA.

[3] Ken Schiff, SCCWRP, personal communication, March 15, 2006

[4] Sobsey, M. 2002. Coliphage Tracking to Identify Sources of Fecal Contamination. Microbiological Source Tracking Workshop, February 5, 2002, Irvine, CA. National Water Research Institute, Fountain Valley, CA.

[5] Ibid.

[6] Ken Schiff, SCCWRP, personal communication, March 15, 2006.

round trip, using the PCR technique for adenovirus and the 28-day standard methods test for coliphage, the total cost for one day of sampling would be $18,974.

Table 1. Cost Estimates for Surface Water Monitoring for Viruses

Expenditure	Cost per Unit
Laboratory Analyses	
Adenovirus, one species, PCR	$2,000/sample
Coliphage, 28-day test	$1,500/sample
Coliphage, presence/absence test	$50 - 100/sample
Field Sampling Costs – two people	$1,440 per day
Vehicle Costs	$34 per 100 mi

4.3 Adaptability of TMDLs and Compliance Schedules Based on New Data or Information

Comment: At the February 8, 2006 meeting, several Board Members requested clarification regarding the adaptability of TMDLs and associated compliance schedules if new data or information becomes available.

Response: As with all TMDLs, the development of the bacteria TMDLs was characterized by data gaps and uncertainties. Scientific uncertainty is a reality within all water quality programs, including the TMDL program, and this uncertainty cannot be entirely eliminated. The TMDL program must move forward in the face of these uncertainties if progress in attaining water quality objectives (WQOs) in impaired waters is to be made.

The National Research Council addressed this issue in their report for the U.S. Congress entitled Assessing the TMDL Approach to Water Quality Management (2000) and concluded that

> "… the ultimate way to improve the scientific foundation of TMDLs is to incorporate the scientific method, and not simply the results from analysis of particular data sets or models, into TMDL planning. The scientific method starts with limited data and information from which a tentatively held hypothesis about cause and effect is formed. The hypothesis is tested, and new understanding and new hypotheses can be stated and tested. By definition, science is this process of continuing inquiry. Thus, calls to make policy decisions based on the "the science," or calls to wait until "the science is complete," reflect a misunderstanding of science. Decisions to pursue some actions must be made, based on a preponderance of evidence, but there may be a need to continue to apply science as a process (data collection and tools of analysis) in order to minimize the likelihood of future errors."

We have structured an adaptive implementation plan in the draft Technical Report that simultaneously makes progress toward achieving bacteria WQOs while relying on monitoring data to reduce uncertainty and fill data gaps as time progresses. This monitoring data can be used to revise and improve the initial TMDL forecast over time. This type of approach will help ensure that implementation of TMDLs is not halted because of a lack of data and information, but rather progresses while better data are collected to verify or refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDLs.

Once adopted, modifications to TMDLs can be incorporated with a subsequent Basin Plan amendment, if appropriate. The request to initiate the amendment process may be voiced by interested persons to the San Diego Water Board at any time.

One option for revising these TMDLs, once adopted into the Basin Plan, is the Triennial Review process. During the Triennial Review, the public may recommend issues that the San Diego Water Board should address in the near future that will result in Basin Plan amendments. The San Diego Water Board develops and adopts a prioritized list of Basin Plan issues that may be investigated over a span of three years. These issues include interpretation of WQOs and incorporation of implementation plans. Initiation of the Basin Plan amendment process can take place during the Triennial Review or upon the San Diego Water Board's direction to staff at any time.

4.4 Addressing Beaches and Creeks Simultaneously

Comment: At the February 8, 2006 meeting, former Board Member Kraus requested that clarification be provided concerning the need to address both beaches and creeks simultaneously, rather than in separate analyses.

Response: One TMDL for each indicator bacteria was calculated for each of the five freshwater creeks (Aliso Creek, San Juan Creek, the San Diego River, Forrester Creek, and Chollas Creek) and their downstream ocean beaches because the beaches and creeks are connected hydrologically, and sources of bacteria to both beaches and creeks are the same; namely urban and stormwater runoff. Thus reducing bacteria loading from urban and stormwater runoff should restore water quality both in the creeks and at the beaches.

The watershed models predicted the accumulation of bacteria on the watershed surfaces and the loading at the critical points, which are model nodes representing the bottom-most point in each watershed before the creeks discharge to the beaches, and before intertidal mixing takes place. The critical point is a modeling tool that theoretically represents the exact point where the freshwater creek ends and the marine water beach environment begins. Because each watershed is unique in terms of hydrological conditions, the point where the freshwater creek system ends, and the marine system begins does not exist in the same location in each watershed. Although useful for calculating bacteria loads and TMDLs, the critical point in the watershed models does not necessarily represent a point in the watershed where TMDL compliance will be measured.

In terms of calculating TMDLs, we chose the more stringent of the marine or freshwater WQO for each indicator bacteria as the numeric target for the five beach/creek

watersheds. For total coliform, the more stringent WQO is associated with the SHELL beneficial use for marine beaches. For fecal coliform, the more stringent WQO is associated with the REC-1 beneficial use for marine beaches. For enterococci, the more stringent WQO is associated with the REC-1 beneficial use for freshwater creeks.

Several dischargers expressed concern that calculating one TMDL per indicator bacteria per watershed erroneously imposes creek WQOs onto beaches, and beach WQOs onto creeks. However, this is not the case. The TMDLs do not require that saltwater SHELL total coliform, nor saltwater REC-1 fecal coliform objectives, be met throughout the creek, or that freshwater enterococci WQOs be met at the beach. We revised the text in the draft Technical Report to make this clear.

In terms of protecting creek water quality, we chose the more stringent enterococci WQO for creeks because the creek is the upstream receiving water. Even though the marine beaches have less stringent enterococci WQOs associated with them, dischargers have no more of a burden to meet this standard at the beach, since the more stringent WQO already has been met upstream.

In terms of protecting beach water quality, we used the more stringent total and fecal coliform targets (these WQOs are more stringent than the WQOs associated with creeks). In taking this approach, we assumed that attainment of the WQOs at the point where the creeks discharge to the beaches will result in attainment of the WQOs at the downstream beach. If WQOs are met at the mouth of the watershed, then WQOs likely also are met at the beach because dilution with the wavewash has taken place. This approach is justified because (1) the beach ocean shorelines are the ultimate receiving waterbodies. All creeks included in this project discharge to the ocean or San Diego Bay which are designated with REC-1 and SHELL uses, (2) the beaches have more recreational users than creeks, and (3) the beaches are designated with the most sensitive beneficial use, shellfish harvesting, whereas creeks are not.

In terms of measuring compliance with TMDLs, the mouths of the watersheds, represented in the models by the critical point, are not necessarily the location where compliance will be measured. The compliance monitoring points for freshwater and marine water TMDLs have not been determined at this time. Appropriate compliance points will be determined on a watershed-by-watershed basis with input from the stakeholders, when the implementing orders for these TMDLs are developed. Compliance will likely be assessed in three categories; 1) load reductions, 2) changes in urban runoff and discharge quality, and 3) changes in receiving water quality. These categories correspond to Levels 4, 5, and 6 in the California Stormwater Quality Association's paper "An Introduction to Stormwater Program Effectiveness Assessment." Dischargers will not be held accountable for achieving SHELL WQOs in the freshwater creeks. The dischargers will be held accountable for reducing total coliform loads at the mouths of the creeks to levels that do not cause the SHELL total coliform WQO to be exceeded at the beaches.

4.5 Nurseries as a Potential Bacteria Source

Comment: At the April 25, 2007 meeting, Board Member Anderson requested that clarification be provided concerning the identification of nurseries as a possible source of bacteria to surface waters.

Response: The Technical Report seeks to describe all controllable nonpoint sources that have the potential to be significant sources of bacteria. Due to their fertilizer storage and usage, nurseries have the potential to discharge bacteria in storm water runoff.[7] As such, the inclusion of nurseries in the Technical Report as a potential significant nonpoint source of bacteria is appropriate. This is consistent with how the TMDL addresses all other controllable nonpoint sources, such as agriculture, dairy/livestock, and horse ranch facilities. However, the inclusion of nurseries in the TMDL as a potential source of bacteria does not mean that nurseries are in fact a significant source. Rather, the Technical Report only requires that to the extent that nurseries are a source of bacteria, that those sources of bacteria be controlled, even though, properly composted manure fertilizers should be devoid of human and animal pathogens.

Regardless of whether or not nurseries are a significant source of bacteria, the TMDLs do not result in a change in how discharges from nurseries are managed or regulated. Waste discharge requirements (WDRs), the WDR Waiver Policy, and the NPS Implementation and Enforcement Policy will continue to apply to nurseries where appropriate. The TMDLs require that nurseries continue to comply with these regulations and requirements. Therefore, if nurseries are currently in compliance with these regulations and rules, the TMDLs will not result in a change in nursery operations. This is especially true if nurseries are determined to not be a source of bacteria. In such a case, the nurseries will have no problem meeting the load allocations prescribed in the Technical Report.

[7] San Diego Stormwater Copermittees, 2005. Baseline Long-Term Effectiveness Assessment. P. C-69.

5 Comments and Responses

5.1 Reference System Approach Basin Plan Amendment

Comment 1

Compliance with contact recreation standards. In all but one watershed, the load allocations for the background/non-controllable sources exceed the TMDL for the watersheds; therefore, the watershed will never attain the water quality standards. The Department strongly supports the Regional Board's adoption of a basin plan amendment to allow implementation provisions for a reference system approach as used to develop the interim limits within the TMDL. We encourage the Regional Board to obtain sufficient data needed for proper characterization of a reference watershed within the San Diego Region. The TMDL provides for 22% of samples during wet weather to exceed standards based on the reference watershed in the Los Angeles Region; however, reference watersheds indicate natural exceedances up to 50% of the time (Table 4-1).

Response: One important difference between the data sets mentioned by Caltrans is that the purpose for acquiring the data was different. In the case of the data from the Arroyo Sequit watershed in Los Angeles, the data were gathered to characterize and quantify a suitable reference system. In contrast, the data from San Onofre Creek and San Mateo Creek watersheds (Table 4-1) were collected by the San Diego County Department of Environmental Health (DEH) during routine monitoring as part of a wider beach monitoring program. These data were not collected for the purposes of characterizing a reference watershed. Additionally, San Mateo Creek beach was rejected as a reference beach for study by the Southern California Coastal Water Research Project (SCCWRP) because of too much development in the watershed. The Technical Report has been modified to discuss this important distinction.

Comment 2

Uncontrollable Sources of Natural Background Bacteria: There are now several studies supporting the fact that year-round natural bacteria sources and re-growth contribute to high bacteria levels and exceedances of water quality standards. The TMDL document states this fact. We recommend the TMDL document include a reasonable allowance for uncontrollable sources of bacteria and re-growth, based on the best available information, in the wet and dry season and for the final TMDLs. This allowance may be adjusted to actual watershed specific conditions over time as special study and monitoring data become available.

We suspect that by not including a reasonable allowance for natural sources, this may cause the negative impact of requiring agencies to spend significant public funds to install systems to treat uncontrollable natural sources of bacteria that have not been proven to impair beneficial uses or be a public health risk.

Response: The interim wet weather TMDLs include a reasonable allowance for uncontrollable sources of bacteria and re-growth based on the reference system approach. A Basin Plan amendment has been initiated to authorize the use of a reference

system/natural sources exclusion approach for the purpose of calculating final TMDLs. Since re-growth on wrack lines and other natural and uncontrollable sources are accounted for in the reference system approach, final wet weather TMDLs will be recalculated using this approach following adoption and subsequent approvals of the reference system approach Basin Plan amendment. The allocations and percent reductions calculated using the reference system approach are expected to be similar to interim wet weather TMDLs. Dischargers will be required to reduce current loading by approximately 22 percent in all watersheds, with the biggest reduction of 53 percent required in the San Diego River watershed. Upon adoption of this Basin Plan amendment, we will recalculate the bacteria TMDLs using the appropriate exceedance frequency.

As opposed to the wet weather approach for calculating TMDLs, a reference system approach will not be utilized for dry weather applications. A reference system approach is not applicable to these dry weather TMDL calculations because numeric targets are based on the geometric mean WQOs. A reference system approach uses an allowable exceedance frequency—meaning the number of times the ***single sample maximum*** WQOs are exceeded in a reference system—to calculate TMDLs. An allowable exceedance frequency does not apply to a geometric mean because the geometric mean is an average value over the course of 30 days. Further, evidence from reference systems show that during dry weather, single sample maximum WQOs are rarely exceeded. However, if significant relevant data become available from reference watershed studies to justify modification of dry-weather TMDLs with a reference system approach, we will consider re-evaluation of the TMDLs. The current dry-weather TMDLs are based on the 30-day geometric mean WQOs, which should be included when considering relevancy of reference conditions. For wet weather, reference conditions were incorporated into the TMDL based on allowable daily exceedances of the single sample maximum WQO. Similar assumptions are not directly transferable to the dry-weather approach, so new approaches for consideration of reference conditions will be required for dry weather.

As stated above, the Basin Plan amendment will incorporate a natural sources exclusion approach for implementing the REC-1 and SHELL WQOs. The natural sources exclusion approach will essentially authorize exceedances of WQOs as long as all anthropogenic sources of indicator bacteria are controlled. Under the natural sources exclusion approach, after all anthropogenic sources of indicator bacteria have been controlled, a certain frequency of exceedance of the WQOs can be authorized based on the residual exceedance frequency in the specific water body. The residual exceedance frequency can be used to calculate an allowable exceedance load for TMDL calculation. Therefore, to the extent that natural background conditions are causing exceedances of WQOs, the dischargers will not be held responsible for those exceedances. Alternatively, a TMDL could also be calculated without an exceedance frequency based simply on the existing bacteria loading after anthropogenic sources have been adequately controlled.

To take advantage of the natural sources exclusion approach, dischargers must control all anthropogenic sources of indicator bacteria. Examples of measures that can be taken by dischargers to control anthropogenic sources of indicator bacteria include enforcement of ordinances requiring pet owners to properly dispose of pet waste, enforcement of

ordinances prohibiting disposal of grease, food products, and other bacteria-laden waste products into the municipal separate storm sewer system (MS4), prevention of nuisance flows from entering the MS4, correction of sanitary sewer/MS4 cross-connections, prevention of infiltration from the sanitary sewer into the MS4, control of or sanitation for homeless encampments in and near water bodies, control of sanitary sewer overflows, etc.

The dischargers expressed a legitimate concern regarding planning and implementing costly controls for the final wet weather TMDLs, and final dry weather total coliform TMDLs as the San Diego Water Board has every intention of revising them. Thus, the dischargers will not be required to submit Bacteria Load Reduction Plans (discussed in sections 11.5.2 and 11.5.3 of the Technical Report) for the final wet weather TMDLs and final dry weather total coliform TMDLs until after we have considered the reference system/natural sources exclusion approach Basin Plan amendment, and considered revisions to those TMDLs. We have committed to considering the Basin Plan amendment and revisions to the TMDLs within one year of the effective date of this TMDL Basin Plan amendment. When we revise the TMDLs, we will also revise the compliance schedule for meeting final wet weather TMDLs, and the final dry weather total coliform TMDL. The revised final wet weather enterococci and fecal coliform TMDLs will likely be similar to the interim TMDLs. Thus, the revised final compliance schedule for these TMDLs likely will not be longer than 10 years. Similarly, we intend to revise the final wet and dry weather total coliform TMDLs for SHELL using the natural sources exclusion approach, and will revise the compliance schedule accordingly based on the estimated time needed to control sources of bacteria associated with human and domesticated animal wastes.

We recognize the concern that dischargers must spend significant resources to reduce bacteria discharges, when pathogens such as viruses are recognized as the causative agent. For this reason, the discussion of special studies described in section 11.6 has been modified to include the need to search for an appropriate and affordable pathogenic indicator of water quality. However, we must emphasize that whether or not natural sources pose a public health risk in and of themselves is not well known. Pathogens from wildlife hosts such as *giardia* have been found in areas where there is little anthropogenic impact.

Comment 3

The text needs to include a reasonable allowance for uncontrollable sources of bacteria and re-growth, based on best available information for wet and dry seasons and for the final TMDLs. As stated in the text, natural bacterial sources and re-growth contribute to high bacteria levels. This allowance may be adjusted to watershed specific conditions, based on special studies and monitoring data as it accumulates over time.

The City's concern is that if reasonable allowances are not made for natural sources of bacteria, cities may be required to spend significant public funds to install systems to treat uncontrollable natural sources of bacteria that have not been proven to impair beneficial uses or be a public health risk.

Response: Please see the response to Comment 2 in regards to the commenter's claim that uncontrollable sources will need to be treated. In terms of public health risk, an important consideration is that illness rates associated with enterococci densities can be costly to beachgoers. In a recent study,[8] scientists investigated the economic impacts associated with contracting gastrointestinal illness from swimming at contaminated coastal waters at beaches in southern California. Authors used water quality data (specifically enterococci) from the year 2000, along with beach attendant data from 28 beaches, spanning 160 km of coastline in Los Angeles and Orange Counties, as input into two epidemiological dose-response models. The authors estimate that approximately 1 million excess gastrointestinal illnesses occur at beaches in Los Angeles and Orange Counties each year due to coastal contamination. Considering loss of time at work, doctor visits, and medicine for each occurrence, this equates to expenditures of about $36 million annually. This number is conservative because it does not include expenses associated with contracting other types of waterborne illnesses, nor does it account for lost recreational value, a swimmer's willingness to pay to avoid getting sick, or loss to coastal market economies that depend on contribution from beachgoers. Although this study focused specifically on beaches in Los Angeles and Orange Counties, we believe the results are applicable to the San Diego Region. Therefore, although we recognize the significant expenses associated with implementing BMPs, we also assert that efforts to abate bacteria contamination are necessary to avoid the likewise significant expenses associated with recreating in contaminated waters.

Comment 4

Section 9.1.2, Tables 9-1 through 9-6, should include Dry Weather wasteload allocations for Caltrans, as well as Dry Weather Controllable Load Allocations for agricultural uses and Dry Weather Non-Controllable Load Allocations for open space/natural background, in parallel to the Wet Weather TMDLs. An identifiable percentage of Caltrans' property features large landscape irrigation systems with potential to discharge runoff during dry weather, and agricultural land is also widely irrigated. Since the model's total annual load is theoretically based on a "critical wet year", it is particularly unreasonable to assume that natural streams in undeveloped watersheds would not be flowing or producing non-controllable background loads except on rainy days. A study in the Aliso watershed suggested that the anthropogenic component of dry weather baseline flow may be in the range of 46 to 87%. The Report text should include a commitment to incorporating flow and bacteria data from SCCWRP's ongoing Natural Loadings project, when these analyses become available, to update the Non-controllable Load Allocation.

Response: Calculation of flows/loads for the critical wet period is a separate issue than for dry periods. The critical period applied to wet weather TMDLs only and consisted of the wet weather days of and hydrology modeled from 1993 rainfall, an extremely wet year. For consistency sake, 1993 rainfall was used to select dry weather days for dry weather TMDL development; however, dry weather loading was estimated as a function

[8] Given, Suzan, Linwood H. Pendleton, and Alexandria B. Boehm. 2006. Regional Public Health Cost Estimates of Contaminated Coastal Waters: A Case Study of Gastroenteritis at Southern California Beaches. *Environmental Science and Technology* (July 2006) 40 (16), 4851 -4858.

of steady-state flows derived from an analysis of average dry weather flows. There is no critical dry period identified. Although the wet days identified in the TMDL were based on those occurring during the critical year 1993, dry days were assumed to occur during low-flow periods when baseflow resulting from preceding wet events are limited and the resulting assimilative capacity of the streams is reduced. Therefore, estimation of dry-weather loads is independent of antecedent periods and the potential presence of residual baseflows from previous rainfall events. Although the occurrence of such dry flows absent of groundwater baseflows is questionable during a wet year such as 1993, the dry day is defined independent of the seasonal or annual conditions, and is specifically defined to protect beneficial uses of receiving waters during periods when the assimilative capacity of the waters is limited due to reduced dilution from non-urban flows.

We did not develop dry weather allocations for Caltrans, agricultural areas, and open space areas for the reasons discussed in the response to Comment 23.

Comment 5

Section 9.1.2, Summary of Dry Weather TMDLs- Dry weather flow included a contribution of groundwater seepage into the stream bed. This baseflow may be affected by bacteria from natural sources such as bird and other wildlife feces. If the upcoming reference creek watershed study will consider these sources, the City of San Diego requests that the reference creek watershed approach be used to modify the bacteria dry weather loads in this TMDL.

Response: Please see the response to Comment 2.

Comment 6

Section 9.1.2 – Summary of Dry Weather TMDLs- Dry weather flow includes a contribution of groundwater seepage into the stream bed. This baseflow may be affected by bacteria from natural sources such as bird and other wildlife feces. If the upcoming reference watershed study demonstrates this, the County of San Diego requests that the reference watershed approach be used to modify the bacteria dry weather loads in this TMDL.

Response: Please see the response to Comment 2.

Comment 7

Section 11.5.7 – This section states that *" Measurements during the 2004-2005 winter season showed that in four reference systems (two in Los Angeles County, one in Orange County and one in San Diego County), 27 percent of all samples collected within 24 hours of rainfall exceeded water quality thresholds for at least one indicator. This is higher that the 22 percent found at Arroyo Sequit watershed in Los Angeles, which was used to calculate interim TMDLs discussed in section 4.1. The Arroyo Sequit watershed is one of the four reference watersheds included in this study."* The City of San Diego

and other dischargers participated in the reference beach study. The 27% exceedance rate should be used in the calculation for interim allowable exceedance rate.

Response: We plan to permanently implement an allowable exceedance frequency for wet weather TMDL calculations, but only after a Basin Plan amendment to incorporate the reference system approach has been adopted and approved. The 27 percent exceedance frequency cited in the SCCWRP report may not be appropriate for the wet weather TMDLs because it applies to the 24 hours after cessation of rainfall. However, wet weather in the TMDLs is defined as up to 72 hours after a rainfall event. Samples collected at the 72-hour mark probably exceed the WQOs at a much lower frequency than 27 percent.

Comment 8

The way certain dry weather data have been used to set targets is not logical. In some instances, shoreline data have been used to support the assumption that there is no loading of indicator bacteria from watersheds during dry weather, despite the fact that creek mouths were sealed by sand berms. Because the berms blocked creek flow, it is not possible to use shoreline data to say anything about bacteria levels on the inland, or creek, side of the berms. They are two physically separate systems. There may or may not have been substantial levels of indicator bacteria in the creeks but it is impossible to determine this. The response that this represents a "margin of safety" is flawed in two respects. First, it is a dangerous precedent to base a margin of safety on an obviously faulty interpretation of system behavior. Second, margins of safety are usually set by applying a multiple of some measured or estimated risk or design parameter. Simply applying an irrelevant measurement and setting a parameter at zero is not an appropriate approach for establishing a margin of safety. While the staff contends that treating this issue differently would not change the overall TMDL targets, the use of an obviously false premise does not inspire confidence that the TMDL is using a systematic and logical approach to dealing with key issues and uncertainties.

Response: The commenter's assertion that dry weather data have been used to set targets is incorrect. For all three indicator bacteria, dry weather numeric targets were based on the geometric mean WQOs described in the Ocean Plan and Basin Plan. The geometric mean was used because dry weather flow is more steady-state in nature than wet weather flows, and a geometric mean represents an average over 30 days. Dry weather beach data from near the outlets of San Mateo and San Onofre Creeks (relatively undeveloped watersheds) were used in this project to show that single sample maximum WQOs are rarely exceeded during dry flow conditions. In contrast, SCCWRP showed that single sample maximum WQOs are frequently exceeded at beaches near the outlets of undeveloped (reference) watersheds during wet weather, or storm flow conditions. Thus, a TMDL that allows some exceedance of single sample WQOs is appropriate for storm flow conditions, but not for dry flow conditions.

In addition, a reference system approach is not applicable to dry weather TMDL calculations because numeric targets are based on the geometric mean WQOs. A reference system approach uses an allowable exceedance frequency—meaning the

number of times the ***single sample maximum*** WQOs are exceeded in a reference system—to calculate TMDLs. An allowable exceedance frequency is not relevant to a geometric mean because the geometric mean is an average value over the course of 30 days.

The low percentage of exceedances of the single sample WQOs could be due to the existence of berms that prohibit creeks from flowing all the way to the ocean. Because the berms are in place, we recognize that there may be substantial levels of indicator bacteria in the creeks, and that the absence of data in the creeks represents an unknown. When berms are in place, exceedances measured in the downstream beaches are likely caused by local sources on the beach that exist downstream of the mixing zone such as birds, marine mammals, or re-growth in the wrack line.

More data should be collected to better characterize a reference watershed during dry weather flows. However, this information would probably not be used to establish implementation provisions for TMDL calculation for dry weather flow, since the geometric mean component of the WQOs are used as the numeric targets. Therefore WQOs, without any allowable exceedances, are sufficient for use as dry weather TMDL targets. The discussion in section 4.2 of the Technical Report has been clarified to this effect.

Setting the numeric targets equal to WQOs, with no application of a reference system is not a margin of safety. The decision not to apply a reference system approach to dry weather was based on the method of TMDL calculation, namely the use of the geometric mean as the numeric target, and the inappropriateness of an exceedance frequency to be applied to the geometric mean. However, the natural sources exclusion approach could be used for achieving dry weather TMDLs.

Comment 9

P. 37, Section 4.2 Dry Weather Targets

a) The document states that "…exceedances of WQOs during dry weather conditions are uncommon in these relatively undeveloped watersheds." The bacteria data utilized were collected either at the mouth of San Mateo Creek or at San Onofre State Beach and shows that there were no dry weather exceedances (Table 4-5). This finding is used to support the decision to make no allowance for reference bacterial loads during dry weather. However, this conclusion is flawed in two ways. First, the Creek apparently does not flow to the beach during the vast majority of the dry weather period. Thus, establishing targets for creeks using samples taken from locations with no physical connection to a creek is not appropriate. Second, assuming the Creek does flow to the beach during dry weather, using samples from the mixing zone at the mouth of the Creek or from a nearby beach to establish targets for a creek itself does not allow for potential dilution due to mixing of the creek water with the ocean. Dry-weather targets for creeks should be established with data from a creek itself, not from the ocean.

b) There is no discussion of whether the data from the Santa Monica reference watershed discharging to Leo Carillo Beach had any dry-weather exceedances. It would be useful to compare dry-weather conditions at the San Mateo and Leo Carillo watersheds, both at the mouth of each and inland.

Response (a): As stated in the response to Comment 2, the data collected at the shoreline of San Onofre and San Mateo Creeks was not used to establish an acceptable exceedance frequency for dry weather. The data was used merely to demonstrate that local beach sources, such as birds, marine mammals, and re-growth in the wrack line, are not sufficient to cause exceedances of single sample maximum WQOs during dry weather conditions.

We recognize that there is essentially no data at this point to quantify bacteria loading from a reference watershed during dry weather. However, a reference system approach will not be used to calculate dry weather TMDLs for the reasons described in the response to Comment 8.

TMDLs were calculated at the critical point in the models for both beaches and creeks. The critical point is a node in the model that represents the bottom of the watershed, before any inter-tidal mixing (dilution) takes place. The critical point was chosen as a conservative measure to protect the downstream beach, where the majority of REC-1 use occurs. If WQOs are met at the bottom of the watershed, then they are most likely met at the beach, after dilution occurs. Dischargers should not rely on dilution to achieve REC-1 WQOs, since beneficial uses apply throughout all segments of a waterbody including creek mouths.

Response (b): Dry weather samples from Leo Carillo beach taken during the winter season showed a 3 percent exceedance frequency. Comparing Leo Carillo beach to San Mateo is improper because the watershed draining to Leo Carillo beach is around 95 percent undeveloped, whereas the watershed draining to San Mateo beach is around 85 percent undeveloped. Because of this, SCCWRP rejected the San Mateo watershed and beach as a reference system for its studies.

Comment 10

P. 69, Section 9.1.2: As stated in Comment 2, the data collected in the local reference system does not adequately represent the level of naturally occurring bacteria in creeks and therefore should not be used to evaluate the rate of exceedances in local reference systems during the dry season. San Mateo Creek apparently does not flow to the beach during the vast majority of the dry weather period. Thus, establishing targets for creeks using samples taken from locations with no physical connection to a creek is not appropriate. Second, assuming the Creek does flow to the beach during dry weather, using samples from the mixing zone at the mouth of the Creek or from a nearby beach to establish targets for a creek itself does not allow for potential dilution due to mixing of the creek water with the ocean. Dry-weather targets for creeks should be established with data from a creek itself, not from the ocean.

Response: Please see the response to Comment 8.

Comment 11

The City is concerned that these TMDLs are moving through the adoption process without sufficient consideration given to whether the proposed WLAs are necessary to protect appropriate beneficial uses. The City suggests that these issues should be resolved prior to adoption of the TMDLs. For example, Regional Board staff is in the process of conducting a reference study which is expected to show that the current proposal to allow zero anthropogenic bacteria in urban runoff is more stringent than necessary to protect Basin Plan-adopted beneficial uses (the State Department of Health standard for drinking water is higher than the final WLAs proposed in the Bacti-1 TMDL). This approach is similar to the "reference system approach" alternative described in the Bacti-1 environmental analysis. This alternative would result in less significant impacts and should therefore be selected for approval.

Similarly, the City has previously presented evidence which suggests that the beneficial uses SHELL and REC-1 have been improperly ascribed to Chollas Creek, resulting in proposed WLAs for metals that are orders of magnitude lower than those permitted at the Point Loma Wastewater Treatment Plant outfall. This approach is similar to the "Water Quality Standards Action" alternative described in the Chollas Dissolved Metals environmental analysis. This alternative would result in less significant impacts and should therefore be selected for approval.

Response: We appreciate the City's concern. However, the approach that we have taken is the most conservative approach that will be protective of the beneficial uses for each water body in the Basin Plan. The beneficial uses and WQOs are established in the Basin Plan, and the bacteria TMDLs were calculated based on these established water quality standards. There may be evidence to suggest that beneficial uses have been improperly ascribed, but the Basin Plan would have to be amended to remove or alter those beneficial uses, which is a process that is separate from a TMDL Basin Plan amendment.

The final wet weather TMDLs and WLAs that were calculated are the most protective of beneficial uses without regard to uncontrollable (natural or background) sources. In contrast, the interim wet weather TMDLs and WLAs were calculated using a reference system approach which allows a 22 percent exceedance frequency of the single sample maximum WQOs for REC-1. The purpose of the exceedance frequency is to account for the natural, and largely uncontrollable sources of bacteria in the wet weather loads generated in the watersheds and at the beaches which can, by themselves, cause exceedances of WQOs.

The dischargers have been provided 10 years to meet the interim TMDLs and final dry weather fecal coliform and enterococci TMDLs. An additional 10 years have been provided in the compliance schedule to meet the final wet weather and total coliform TMDLs. We are currently in the process of developing a Basin Plan amendment to permanently allow the use of the reference system approach in calculating TMDLs and WLAs. The reference system approach Basin Plan amendment is a high priority for us.

We fully expect to adopt the reference system approach Basin Plan amendment before the dischargers must comply with the final TMDLs.

Once the reference system approach Basin Plan amendment is adopted, region-wide, bacteria-specific, and/or watershed-specific allowable exceedance frequencies may be developed, and the TMDLs and WLAs will be revised accordingly. The region-wide, bacteria-specific, and/or watershed-specific allowable exceedance frequencies that are developed are expected to be close to the 22 percent exceedance frequency that was used in the interim wet weather TMDL calculations. Therefore, after the reference system approach Basin Plan amendment is adopted, the final wet weather TMDLs will likely become similar to the interim wet weather TMDLs that were calculated. In the Implementation Plan, the San Diego Water Board has committed to considering the reference system/natural sources exclusion approach Basin Plan amendment, and revised final wet weather and dry weather total coliform TMDLs within one year of the effective date of the amendment for this TMDL project.

The reasonable alternatives to the TMDL Basin Plan amendment are discussed in section R.8 of Appendix R. One alternative is to correct the water quality standards ascribed to the beaches and creeks through a use attainability analysis. However, the appendix states that the San Diego Water Board has no evidence that REC-1 and SHELL beneficial uses were inappropriately designated for the beaches and creeks.

The City of San Diego did provide the San Diego Water Board with information showing that parts of Chollas Creek and the San Diego Bay shoreline at the mouth of Chollas Creek were substantially modified from their natural conditions prior to November 28, 1975. This date is significant because according to the Clean Water Act, beneficial uses that existed in waterbodies on or after this date must be designated for the waterbody in the Basin Plan. Much of Chollas Creek was hydromodified into concrete channels while the natural San Diego Bay shoreline was industrialized with rip rap and vertical concrete seawalls. The City of San Diego suggested that, because of the modifications to the channel and shoreline, the beneficial uses ascribed to Chollas Creek and the SHELL use ascribed to San Diego Bay at the mouth of Chollas Creek might not have existed on or after November 28, 1975.

The fact that the hydromodification took place before November 28, 1975 alone is not enough evidence to rebut the presumption that one or more of the beneficial use designations was improper. More definitive information is needed on whether or not the pre-1975 hydromodifications precluded the WARM, WILD, potential REC-1, and REC-2 beneficial uses of Chollas Creek, and the REC-1 and SHELL beneficial uses of San Diego Bay at the mouth of Chollas Creek, and whether or not water quality in Chollas Creek and San Diego Bay at the mouth of Chollas Creek has ever been at a level to support these uses since November 28, 1975. We suggest that the City of San Diego continue to investigate this issue and provide us with more complete information. This issue can also be submitted for consideration during the next Triennial Review of the Basin Plan.

Comment 12

Why doesn't Regional Board staff complete the bacteria reference study before recommending adoption of the Bacti-1 TMDL?

Response: Adoption of these bacteria TMDLs do not rely upon the reference system approach Basin Plan amendment. These TMDLs already include a reference system approach in its calculation of an interim wet weather TMDLs. The reference system/natural sources exclusion approach Basin Plan amendment will only change the final wet weather TMDLs.

Delaying adoption of the TMDLs until adoption of the reference system/natural sources exclusion approach Basin Plan amendment will result in added and unnecessary delays in implementing the interim wet weather TMDLs and the final dry weather fecal coliform and enterococci TMDLs. The revised final wet weather TMDLs (per the reference system/natural sources exclusion amendment) are likely to be very similar to the interim wet weather TMDLs, and the dry weather fecal coliform and enterococci TMDLs will not be affected by the reference system/natural sources exclusion approach Basin Plan amendment. Therefore, the dischargers should be compelled to take actions to meet the interim wet weather TMDLs, and dry weather fecal coliform and enterococci TMDLs without further delay.

The final wet and dry weather SHELL TMDLs will be revised pursuant to the natural sources exclusion approach Basin Plan amendment, however, this revision of the TMDLs will occur after bacteria load reduction BMPs have successfully controlled anthropogenic sources of bacteria associated with human and domestic animal wastes. At that time, the TMDLs can be recalculated based on the actual bacteria loading to the watershed, or on the actual WQO exceedance frequency at the beach with the bacteria reduction BMPs in place and functioning.

The dischargers have a legitimate concern regarding planning and implementing costly controls for the final wet weather TMDLs since the San Diego Water Board has every intention of revising them. Thus, providing additional time in the compliance schedule to meet the final wet weather TMDLs is reasonable so that the dischargers will not have to engage in implementation planning for TMDLs that will be revised. Extending the compliance schedule for the final wet weather and final dry weather total coliform TMDLs to 20 years and not requiring the dischargers to submit pollution control reduction plans for these TMDLs until after the San Diego Water Board has considered the reference system/natural sources exclusion approach Basin Plan amendment, and considered revisions to these TMDLs should provide sufficient time and flexibility for achieving the final TMDL requirements.

Comment 13

The acceptability of the Draft TMDL is predicated on the prior or concurrent approval of a companion Basin Plan Amendment (BPA) allowing the use of the "reference system approach" to natural source exclusions for wet and dry weather, which would allow the "interim" targets in the Draft TMDL to become "final" targets. Although the 'reference system' BPA was given priority for funding in the last Triennial Review cycle and the

amendment process was actually initiated, it has been brought to the SAG's attention that RWQCB staff have subsequently been diverted and the BPA process has been effectively put on hold. The TMDL is not acceptable or implementable without the BPA. Approval of the TMDL accompanied by delays in the BPA approval could force the Permittees to prepare Bacteria Load Reduction Plans based on the Final targets instead of the Interim ones. More ominously, if EPA ultimately upheld the TMDL but not the BPA, every MS4 and Agricultural land use will be required to implement 100% reduction of all wet-weather bacteria loads within 10 years – a feat that is technically and economically infeasible and counter to the expressed intent of the TMDL (see Section 11.5.7: "A Basin Plan Amendment to authorize the reference system approach… is required to avoid the need to attain the final TMDLs." It is critical that the 'reference system' BPA be put back on the front burner so it can move through the required Regional, State and Federal EPA approvals prior to, or at least concurrently with, the TMDL. This may mean that the TMDL approval should be deferred while the BPA catches up; or that the TMDL approval should be explicitly contingent on BPA approval and that the TMDL's forwarding for SWRCB and EPA approval should be delayed accordingly.

Response: The San Diego Water Board is actively working on the reference system approach Basin Plan amendment at this time. However, as previously stated, adoption of these bacteria TMDLs do not rely upon the reference system approach Basin Plan amendment. These TMDLs already include a reference system approach in its calculation of interim wet weather TMDLs. The reference system approach Basin Plan amendment will only change the final wet weather TMDLs. Please see the responses to Comments 2 and 12 for additional explanation.

Comment 14

Section 11.5.7 discusses the Reference Watershed Basin Plan Amendment and indicates that the RWQCB will "investigate and process the proposed reference system Basin Plan amendment in accordance with local priorities and resources." The Basin Plan amendment process, although given priority for funding in the current Triennial Review, is already substantially behind schedule. This wording leaves open the possibility of substantial and indefinite delays in processing the reference system amendment and completely ignores the potential impact of any such delay on the dischargers, who would be compelled in the meantime to prepare and begin implementing Bacteria Load Reduction Plans based on Final targets currently shown as up to 100% reductions. This is not an appropriate use of resources. There may be several alternatives to resolve this problem, including: 1) the approval of this TMDL could be delayed until the Basin Plan amendment catches up to it in the approval process; 2) approval and implementation of the TMDL could be made contingent on the approval of the Basin Plan amendment; or 3) a final sentence could be added to this section specifying:

> *In the interim, Bacteria Load Reduction Plans will be allowed to provide for phased Plan development; dischargers will not to be required to include provisions for attaining the Final targets until after the Basin Plan amendment is approved and the re-calculations are incorporated into the TMDL.*

In any case, prudence would dictate that the Reference System Basin Plan amendment needs to be completed as soon as possible. The RWQCB should make a specific timing commitment in this regard.

Response: Please see the responses to Comments 2 and 12.

Comment 15

Section 11.5.7 makes reference to SCCWRP's Natural Loading Studies and describes natural exceedances of Total Coliform, but neglects to mention that these data also identified significant natural exceedances of Enterococci and E. coli (a subset of Fecal Coliform) under both wet and dry conditions. SCCWRP's "reference" bacteria studies for both wet and dry weather are ongoing and substantially more local exceedance-rate data will be available by Summer 2007. The EPA representative (in preliminary meetings with RWQCB staff and the SAG relating to the Reference System Basin Plan amendment) has already preliminarily concurred that naturally-occurring dry-weather bacteria need not be controlled and that the Basin Plan amendment could reflect this policy. Section 11.5.7 indicates that "After this [Reference System] Basin Plan amendment is adopted, TMDLs included in this project can be re-calculated to reflect an appropriate exceedance frequency." Given the SCCWRP findings and the EPA concurrence, this sentence should be revised to read, " …TMDLs included in this project will be re-calculated to reflect appropriate wet- and/or dry-weather exceedance frequencies"; or other wording to acknowledging dry-weather natural bacteria occurrence. The text should also identify who will be doing this re-calculation and what procedural requirements there will be to incorporate the new findings as the new Final targets. The text should also indicate that exceedance rates used for the re-calculations may vary among the different waterbodies if local reference data provide sufficient justification.

Response: At this time, the reference system approach will only be applied to the wet weather TMDLs. However, the natural sources exclusion approach could be used for attainment of dry weather TMDLs. The natural sources exclusion approach will allow the San Diego Water Board to develop TMDLs that result in exceedances of WQOs for both REC-1, REC-2, and SHELL uses, as long as all bacteria sources associated with human and domesticated animal wastes are controlled. Under the natural sources exclusion approach, after all such sources of bacteria are controlled, a certain frequency of exceedance of the WQOs can be authorized based on the residual exceedance frequency in the specific water body. The residual exceedance frequency can be used to calculate an allowable exceedance load for the purpose of a TMDL. Alternatively, a TMDL could also be calculated without an exceedance frequency based simply on the existing bacteria loading after anthropogenic sources have been adequately controlled.

Comment 16

Section 11.5.7 discusses the Reference Watershed Basin Plan Amendment and indicates that the RWQCB will "investigate and process the proposed reference system Basin Plan amendment in accordance with local priorities and resources. After this Basin Plan

amendment is adopted, TMDLs included in this project can be re-calculated to reflect an appropriate exceedance frequency."

The acceptability of the Draft TMDL is predicated on the prior or concurrent approval of a companion Basin Plan Amendment (BPA) allowing the use of the "reference system approach" to natural source exclusions for wet and dry weather, which would allow the "interim" targets in the Draft TMDL to become "final" targets. Although the 'reference system' BPA was given priority for funding in the last Triennial Review cycle and the amendment process was actually initiated, it has been brought to the SAG's attention that RWQCB staff have subsequently been diverted and the BPA process has been effectively put on hold. The TMDL is not acceptable or implementable without the BPA. Approval of the TMDL accompanied by delays in the BPA approval could force the Permittees to prepare Bacteria Load Reduction Plans based on the Final targets instead of the Interim ones. More ominously, if EPA ultimately upheld the TMDL but not the BPA, every MS4 and Agricultural land use will be required to implement 100% reduction of all wet-weather bacteria loads within 10 years – a feat that is technically and economically infeasible and counter to the expressed intent of the TMDL (see Section 11.5.7: "A Basin Plan Amendment to authorize the reference system approach… is required to avoid the need to attain the final TMDLs." It is critical that the 'reference system' BPA be placed as a high priority for RWQCB so it can move through the required Regional, State and Federal EPA approvals prior to, or at least concurrently with, the TMDL. This may mean that the TMDL approval should be deferred while the BPA catches up; or that the TMDL approval should be explicitly contingent on BPA approval and that the TMDL's forwarding for SWRCB and EPA approval should be delayed accordingly.

Response: Please see the responses to Comments 2 and 12.

Comment 17

Conceptually, the use of the reference system approach for wet weather is appropriate and your Board should consider adopting a Basin Plan Amendment allowing the use of the reference system approach in bacteria TMDLs. However, the methodology of combining the reference system approach developed by the Los Angeles Regional Board to allow a specific exceedance frequency with the wet weather loading approach above to estimate required load reductions during wet weather, is without technical basis. Further, we are very concerned with the lack of sensitivity analysis associated with the current reference system approach. Local reference stations, based on limited data show exceedances of up to 50%, yet the allowable frequencies specified in the TMDL, based on data from the Los Angeles Regional Board, are 22%. We believe that the potential impacts associated with characterizing the sensitivity of reference watersheds to variability justify rigorous and prioritized investigation. Finally, the reference system approach should also be applied to winter dry weather as is the case in TMDLs conducted by the Los Angeles Regional Board.

Response: In developing the reference system approach, there will be variation in exceedance frequencies from reference watershed to reference watershed. There will also

be variation in exceedance frequencies based on the method used to determine an acceptable exceedance frequency (e.g., minimum, mean, maximum).

The commenter notes that local reference stations show exceedances of up to 50 percent. However, the commenter fails to note that there are data from reference watersheds that have exceedances as low as 0 percent.

We used a conservative approach when developing the TMDLs. Until evidence is provided that demonstrates a less conservative approach is warranted, the TMDLs that are developed must be protective of the beneficial uses of the receiving waters. At this time, we determined that an allowable exceedance frequency of 22 percent, based on data from the Los Angeles Water Board to be acceptable by the San Diego Water Board for purposes of developing interim TMDLs. When the reference system/natural sources exclusion approach Basin Plan amendment is adopted, region-wide, bacteria-specific, and/or watershed-specific allowable exceedance frequencies will be developed. In regards to applying the reference system approach to winter dry weather, please see the response to Comment 8.

Comment 18

At various points in the document, there is discussion about the use of reference systems. In general, the technical authors appear to justify the use of reference conditions for comparisons of the wet weather data. There is considerable precedence for this technical approach. Although the authors present data using the reference system approach, they explain that the Basin Plan does not yet permit such an approach (i.e., that the TMDL program would need to wait for a potential lengthy public review process of the Basin Plan to consider it). Considering that the TMDL program was established to provide comprehensive protection and regulation of watershed and waterbody aquatic ecosystems, it is unfortunate that it can be undermined by the failure to integrate it with the legacy regulatory programs. This should be a simple fix during the next Basin Plan update.

Response: The reference system approach Basin Plan amendment is a high priority for the San Diego Water Board and is currently being developed. TMDLs will be recalculated and the compliance schedule adjusted once the Basin Plan amendment has been adopted. We have committed to considering the Basin Plan amendment and revisions to the TMDLs within one year of the effective date of this TMDL Basin Plan amendment.

Comment 19

Considering reference system comparisons in the document, there should be more justification provided for the use of the Los Angeles region, which provides the 22% exceedance value. For the limited data set established regionally, the values are considerably higher. It seems that the Board would want to find reference conditions close to the sites of concern rather than further away.

Response: Since the interim TMDLs were developed, the SCCWRP has characterized three additional reference beaches, and is in the process of characterizing reference subwatersheds. We intend to consider all the available reference system data when we recalculate the final wet weather TMDLs.

Comment 20

We are also concerned about the fact that the wet weather allowable load for controllable nonpoint sources is zero. This puts farmers in the untenable position of controlling one-hundred percent of indicator bacteria when, as mentioned above, there is a lack of evidence for the need for control. It is critically important that this TMDL return to the reference stream approach as used in the interim TMDL. At a minimum, farmers should be granted the load that is given to like acreages of uncontrollable nonpoint sources. This is given the fact that if the farm didn't exist and the land was in its natural state an allocation would be granted.

Response: We do not agree that farmers should be granted a load that is given to similar acreages of uncontrollable nonpoint sources. Bacteria loads from uncontrollable nonpoint sources (i.e., open spaces) are different than from farmers (i.e., agriculture/livestock). For open spaces, the assumption is that there are no human activities, and the bacteria loads originate from the wildlife fauna.

However, farmers and their activities (e.g., livestock maintenance and manure management, application of amendments and/or mulches to soil) have an anthropogenic influence on the land, which can have a significant impact on the potential bacteria loads that can be transported in storm water runoff. If farmers implement proper management measures and practices, bacteria loads can be eliminated from storm water that runs off from agricultural lands to receiving waters. Another important point is that farmers are not required to take additional pollutant load reduction actions beyond what is required in WDRs and waivers.

As discussed above, the reference system approach Basin Plan amendment is a high priority for us and is currently being developed. The dischargers have been provided 10 years to meet the interim TMDLs. An additional 10 years have been provided in the compliance schedule to meet the final TMDLs. Upon adoption of the reference system Basin Plan amendment, we will recalculate TMDLs and adjust the compliance schedule appropriately.

Comment 21

Reference System Basin Plan Amendment Appropriately Follows TMDL Adoption.

We support the use of a reference system approach, as is envisioned in the TMDL through the interim targets. We understand that staff is now working on a Basin Plan Amendment (BPA) to allow those interim targets to replace the final targets. The reference system approach is the most appropriate way to develop a TMDL that will ensure beneficial uses are attained without requiring control of natural sources.

We are well aware of the stated concerns of some municipalities that the BPA and Bacteria TMDL are not coming forward at the same time. Both Regional Board staff and SAG members understand that our mutual goal is to adopt the interim targets as final once the BPA has been prepared. However, we must begin the TMDL process. There is no sense in delaying the TMDL in order to bring it to you concurrently with the BPA. Rather, the TMDL should move forward, followed closely by the BPA. Municipality concerns that the BPA process will never move forward to approval are unfounded, as that very act is the stated goal in the TMDL. Conversely, there are very real concerns that should the TMDL not be adopted now, it and the BPA may be severely delayed. Without the pressure of an approved TMDL, municipalities will not have incentive to begin this cleanup and reduction process. The affected waters have been on the 303(d) list of impaired waterbodies for years. We cannot afford to wait while public health and safety continue to be at risk.

Response: We agree that dischargers should not delay implementing bacteria load reduction BMPs. Adoption of these bacteria TMDLs do not rely upon the reference system approach Basin Plan amendment. Once these TMDLs are adopted, dischargers must begin or continue to meet load allocations and wasteload allocations in accordance with the compliance schedule for the reasons discussed in the response to Comment 12. However, once the reference system Basin Plan amendment is adopted, we will recalculate some of the TMDLs and adjust the compliance schedule appropriately.

Comment 22

An appropriate reference site should be selected in the San Diego Region.

An important modification that needs to occur in the SD beaches and streams TMDL is the usage of the 22% allowable exceedances as a target. The 22% allowable exceedance value was not determined as acceptable by Region 4, but the approach based on the number of exceedances at a reference beach during the 90th percentile storm year was approved. We strongly urge the SD Board to modify their approach and determine allowable exceedances based on the number of exceedances at a reference beach during the 90th% storm year. This is an easy analysis with the extensive monitoring data base that exists in the SD region.

There has been a great deal of concern expressed about how an exceedance based approach is not consistent with the current SD Region Basin Plan. The Los Angeles Region routinely modifies the Basin Plan with Basin Plan amendments concurrently with approval of their TMDLs. We strongly encourage the San Diego region to move forward with a Basin Plan amendment concurrently with TMDL approval to ensure that public health protection and Rec-1 waters beneficial use attainment occur as soon as feasible.

The Santa Monica Bay fecal bacteria approach was utilized in San Pedro Bay, Marina Del Rey and Malibu Creek as well.

Response: The commenter incorrectly states that these TMDLs are not consistent with an exceedance frequency based approach. Interim TMDLs were calculated using exactly this approach (see Technical Report, section 8). Assuming the commenter is referring to how TMDL compliance will be assessed, this statement is also incorrect for the reasons

stated in the response to Comment 147. The TMDL process will not be put on hold while we develop the reference system approach Basin Plan amendment because it is imperative that dischargers begin load reductions immediately.

5.2 Technical Analysis

Comment 23

The TMDL needs to develop load and waste load allocations for all identified sources of bacteria for both dry and wet weather. Only wet weather loadings have been developed for Caltrans and non-point sources from open recreation, open space and confined animal feeding operations based on the assumption that loading will only occur during rain events and that rain water is the only source of water for creeks. This assumption erroneously ignores irrigation practices by Caltrans and on open space and agricultural areas during dry weather and documented base flow in perennial creeks in the watersheds. Since irrigation is seen as the cause of the majority of loading from urban areas, this reasoning should be applied equally to Caltrans, managed open space and agricultural/animal feeding operation lands where irrigation also occurs. Additionally, a load allocation should be developed to reflect the natural level of bacteria in creek base flows during dry weather.

Response: The lack of a WLA for Caltrans and LAs for agricultural dischargers for dry weather is premised on the assumption that these sources are unlikely to discharge significant bacteria loads during dry weather. Irrigation runoff from these sources was assumed to be minimal compared to irrigation practices within urbanized watersheds that drain to MS4s owned and operated by municipalities.

Transportation land use areas used in the model only include hardscape areas. Although Caltrans-owned right of ways encompass landscaped areas, these areas were included with other land use types and attributed to the Municipal dischargers. The total irrigated right-of-way area is small compared to the other urban land use areas that produce nuisance flows into the MS4s. Table I-2 shows that the Caltrans occupied areas in the 12 watersheds of this TMDL project range in size from 0.00 square miles to 1.94 square miles. Assuming that the irrigated right-of-ways are twice the area of the impermeable highway areas, the largest irrigated area would be just less than 4 square miles. This value is for the San Diego River watershed. These areas are so small relative to the rest of the urban areas that a dry weather wasteload allocation is not justified. Although no load reductions are required from Caltrans, bacteria discharges should not increase above current loading. For this reason, the Technical Report was modified to state that we will recommend that the State Board develop WQBELs to establish an upper limit on bacteria loading equal to the current loading. Load reductions are not required; conversely, no increases in loading are allowed.

Under the Waiver Policy, discharges from controllable nonpoint sources such as discharges from animal feeding operations and agricultural and nursery irrigation return water are not allowed to cause nuisance conditions to receiving waters or violations of applicable WQOs. Thus, if dischargers are abiding by the conditions stated in their WDRs and waivers, then no exceedances of WQOs are occurring, and the initial assumption that dry weather loading is insignificant is correct. The Implementation Plan states that the San Diego Water Board will enforce facility specific WDRs and waivers with respect to discharges from animal feeding operations, manure composting and soil amendment operations, and agricultural and nursery irrigation return flow in the

watersheds with significant agricultural sources of bacteria (the San Juan Creek, San Luis Rey River, San Marcos Creek, and San Dieguito River watersheds). If, upon enforcement of the waivers, nuisance conditions or exceedances of WQOs still occur from agricultural bacteria sources then WDRs can be issued to violators.

We did not consider loading from creek base flows in TMDL calculations. Base flows from groundwater can be associated with residual flows from wet weather events. Since dry weather modeling is distinct from wet weather modeling, we did not include contribution from base flows. A conservative approach for assessing dry weather loads is to exclude dilution factors such as base flows. Appendix L has been modified to include a discussion of this conservative assumption.

Comment 24

Section 9.1.2, Tables 9-1 through 9-5 - Overspray from the irrigation of roadside landscapes contributes to dry weather flows. Caltrans should be allocated a dry weather flow load to reflect this contribution.

Response: Please see the response to Comment 23.

Comment 25

P. 9, Section 1.4; para. 5: The statement "…Caltrans-owned areas (freeway surfaces) are unlikely to discharge bacteria to receiving waters during dry weather conditions because there is no flow source to wash off of Caltrans highways during dry weather." ignores the irrigation practices which are cited as the prime source of urban runoff attributed to the MS4 system. Irrigation of landscaped areas in Caltrans right-of-ways provides a flow source for the wash off of bacteria during dry weather and should be included in the dry weather waste load allocation.

Response: Please see the response to Comment 23.

Comment 26

Page 4, last paragraph describes the wasteload allocations for Caltrans using the impermeable surfaces of the Caltrans owned highways. During dry weather the report states that there is no significant urban runoff from the highways. Accordingly on page 69, dry weather WLA's were not distributed to Caltrans. There is a potential bacterial runoff from the irrigated landscape areas immediately adjacent to the highways and maintained by Caltrans during wet and dry weather. It is known that Caltrans uses where it is available, reclaimed water for irrigation. Even though the reclaimed water is disinfected address the potential for re-growth of bacteria. Also address the fertilizers applied to the landscape as a source of bacteria. The total bacterial runoff from impermeable highway surfaces and irrigated landscapes should be evaluated and WLAs assigned as required.

Response: Please see the response to Comment 23.

Comment 27

The TMDL should distribute load and waste load allocations to all identified sources of bacteria for both dry and wet weather. To date, only wet weather loadings have been developed for Caltrans and non-point sources from open recreation, open space and confined animal feeding operations based on the assumption that loading will only occur during rain events and that rain water is the only source of water for creeks. This assumption erroneously ignores irrigation practices by Caltrans and on open space and agricultural areas during dry weather and documented base flow in perennial creeks in the watersheds. Since irrigation is seen as the cause of the majority of loading from urban areas, this reasoning should be applied equally to Caltrans, managed open space and agricultural/animal feeding operation lands where irrigation also occurs.

Response: Please see the response to Comment 23.

Comment 28

Wet weather modeling. The technical report's definition of wet weather conditions is not appropriate for many types of storms. In relatively undeveloped watersheds, 0.2 inches of rain will produce little or no direct runoff, and any impact on water quality is unlikely to persist for 72 hours. Consequently, many of the observed values at monitoring sites throughout the watershed may not be representative of true wet weather conditions.

The use of basin-wide summary statistics for model calibration and verification is not appropriate. For instance, water quality measurements from 59 sites in the Aliso Creek watershed are averaged together for comparison with predicted data. Model results should be compared only to single sites that correspond to the locations of the predicted values.

To assess model fit with available data, the time series model output was graphically compared to the observed data. This is not an appropriate test for model calibration and verification. A quantitative test using root mean square error or other comparable methodology would be preferred. The horizontal and vertical scales of the figures presented in Appendix N preclude any meaningful visual assessment of the match between observed and predicted values.

Figures 12 through 25 in Appendix N depict the average and range for observed and modeled fecal coliform, total coliform, and enterococcus concentrations in the basins. In contrast to the conclusion of the report, these graphs indicate that the model does a poor job in many of the watersheds of predicting bacteria concentrations. Even where observed and predicted values appear to be relatively close together because of the logarithmic scale, the observed and predicted values often differ by a factor of 5 to 10 or more.

Response: We recognize the discrepancy between the assumption for defining a wet-weather event and the occurrence of actual wet flows. Wet days, identified based on the defined storm (0.2 inches of rainfall and the following 72 hours) may not be entirely accurate for identifying wet-weather monitoring data. Regardless, observed data were used only for model validation, and comparison did not result in modification of bacteria

modeling parameters. Recall that the bacteria build-up/wash-off modeling parameters were assumed "previously calibrated" based on robust analysis at land-use-specific sites in the Los Angeles Region. Similar detailed land use runoff data were not available in the San Diego Region. Therefore, for this study the bacteria modeling parameters were "validated" through comparison with local data, but not enough data were considered available in the San Diego Region to justify adjustment of modeling parameters through additional calibration. As a result, selection of wet-weather data in the region for comparison to model-predicted bacteria densities may have impacted analysis, but did not result in adjustment of modeling parameters potentially caused by unrepresentative wet-weather data.

Where data were not collected at consistent locations of model subwatershed outlets, data collected throughout the subwatersheds were pooled and relative ranges of observed bacteria densities were compared with ranges predicted by the models at the subwatershed outlet. The results shown in Figures N-12 through N-24 provide an analysis of the general trends, but were not used to support or justify calibration of modeling parameters. Regardless, comparisons in Figures N-12 through N-24 were provided in an attempt to utilize all data collected in the region, although these datasets may not be suitable for robust model calibration, nor was the purpose for their collection associated with watershed model development. However, results of these comparisons show the dependence of both model results and observed data on flow magnitudes, which were normalized in these figures based on watershed area. Except for lower flow ranges, the general trend of model results and observed data appear to be consistent relative to the flow ranges shown. To address low-flow periods that were not predicted with accuracy based on LSPC, a separate modeling approach was developed.

Model calibration and validation can be performed using both quantitative and qualitative techniques. Qualitative calibration and validation are often performed using graphical analysis, as was reported for both hydrology and water quality for the dry- and wet-weather models of the report. Quantitative evaluation of model uncertainty of bacteria predictions based on the recommended methods requires a robust set of observed data to provide meaningful comparison to model predictions and result in statistical significance. Such large datasets were not available for most watersheds used for model validation in this study. In addition, the extreme variability of bacteria densities (often exceeding orders of magnitude) further impacts statistical calculations.

To present the graphical comparison of model results with observed data, logarithmic scales were used on the y axis for bacteria densities. Given the logarithmic variability of bacteria levels, accuracy of a model within an order of magnitude is generally considered successful. In addition, logarithmic comparisons of bacteria concentrations are typical. It should be noted that if bacteria levels were reported on a normal scale, visual inspection of model results and observed data would be even more difficult, as much of the smaller concentrations would be practically impossible to read and evaluate due to the extreme vertical range.

Comment 29

Table 1-2 indicates that beaches and creeks included in this TMDL project are to meet more rigorous requirements than beaches that are not listed as impaired. Beaches must exceed standards more than 4% of the time to be listed as impaired; whereas, listed beaches will be allowed "no" exceedances**.** What is the rationale for this difference?

Response: We assume that this comment refers to the 4 percent allowable exceedance percentage allowed for beach monitoring data on page 5 of the *Water Quality Control Policy for Developing California's Clean Water Act 303(d) List* (Listing Policy). Comparing the allowed exceedance percentage in the binomial test in the Listing Policy to the exceedance frequencies allowed in the TMDL calculations is off base. The TMDL is a plan for attaining bacteria WQOs and restoring beneficial uses in receiving water. Conservative assumptions and margins of safety are utilized in the TMDL to ensure that water quality supports beneficial uses in the receiving water at all times. The binomial test is applied to a monitoring data set for a water body to determine whether or not the waterbody is impaired and a TMDL should be calculated for the waterbody. Exceedances in the binomial test are allowed to account for potential transient effects, errors, bias, and outliers in the data.

Comment 30

Page 33 of the draft Technical Report explains how staff determined the TMDL for beaches and creeks. Total coliform was used for numeric targets in the TMDLs to determine the required load reductions needed to ensure that the REC-1 and SHELL beneficial uses will be protected. Some stakeholders have expressed a concern that the selection of the same numeric targets for beach and creeks would enforce salt water total coliform limits in the creeks. Coastkeeper does not believe that this concern is valid. It is possible, however, that in order to meet the SHELL standard in the saltwater, a more stringent creek WQO may be required. We suggest that the draft Technical Report be revised to state that the intent is not to impose the salt water coliform limits on creeks. Rather, the modeling used to determine the TMDLs includes an implicit margin of safety. As staff responded in peer review, the location of the critical point and the use of total coliform provide, at least in part, the margin of safety.

Response: The Technical Report was clarified in the March 9, 2007 version regarding the use of the total coliform WQOs as numeric targets for TMDLs applied at the mouths of the creeks. As the commenter suggests, our intent is not to impose total coliform WQOs for SHELL uses throughout the creeks, but to ensure that water quality in the creeks where they discharge to coastal waters is protective of SHELL beneficial uses at the beaches and in San Diego Bay. For further discussion regarding the simultaneous technical analysis of beaches and creeks, please see section 4.4.

Comment 31

The technical analysis is based on the assumption that all bacteria loading from sewage spills will be reduced to zero and thus this source of bacteria receives a 100% reduction in the TMDL. This assumption is not realistically achievable.

Response: Whether or not publicly owned treatment works (POTWs) can reduce sewage spills to zero, such spills are prohibited in their waste discharge requirements and prohibited by the Basin Plan. Therefore, sewage spills were not included in the source analysis, and therefore were not assigned a WLA. However, as the comment notes, WLAs for POTWs are essentially zero. Water quality data used for model calibration and validation were cross-referenced with sewage spill information. Any exceedances in bacteria WQOs associated with sewage spills were removed from the data set, ensuring that model calibration, validation, and output consisted of loading from urban runoff from the watersheds.

POTWs, and other potential dischargers not mentioned in section 10 of the Technical Report, are allowed zero discharge. Should a sewage spill occur, loads associated with the discharge would not be counted against the LAs and WLAs assigned to dischargers. Loads associated with sewage spills are regulated under San Diego Water Board Order No. R9-2007-0005.

Comment 32

The technical analysis is based on the assumption that all bacteria loading from encampments of homeless individuals will be reduced to zero and thus this source of bacteria receives a 100% reduction in the TMDL. This assumption is probably not achievable and addresses a wide-reaching societal issue that is germane to the [Water Code section] 13241 requirement that affordable housing is considered.

Response: Bacteria discharges from direct deposition of human feces into and near receiving waters did not receive an allocation in these TMDLs. Unlike urban runoff, bacteria loading from human feces is completely from human sources and carries a higher risk of association with human pathogens. Like pet waste, deposition of human feces where it can be transported to storm drains or receiving water should be highly discouraged in the municipal dischargers' storm water programs. Attainment of WQOs and the requirements of this project will take place in part through enforcement activities by municipalities to discourage a range of discharges or illegal activities, including direct deposition of human feces where it can be transported to storm drains or receiving waters.

Water Code section 13241 is not applicable to this TMDL project since section 13241 only applies when new WQOs are established. The bacteria TMDLs interpret existing WQOs as stated in the Basin Plan, but do not promulgate new objectives.

Comment 33

The document does not appear to have been developed in accordance with the Revised Draft Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure & Options (June 2005) or the Draft State of California S.B. 469 TMDL Guidance (March 2005). Attachment A: Impaired Waters Regulatory Decision Tree of the Regulatory Structure and Options guidance outlines the regulatory options available to address impaired waters, many of which have not been evaluated for the bacteria-

impaired water bodies covered by the Technical Draft. Prior to developing a TMDL, the following steps should be taken:

a) The original listing of the water body should be re-evaluated based on current, existing data. According to Regulatory Structure and Options policy, "If the water body is neither impaired nor threatened, the appropriate regulatory response is to delist the water body." Several Laguna Beach area beaches are currently included in the TMDL despite the fact that they have been meeting water quality standards since 1999. Data and statistical evaluations to support the delisting has been provided to Regional Board staff. Based on the 303(d) List De-listing criteria, the following sites should be de-listed and removed from the TMDL: Cameo Cove at Irvine Cove/Riviera Way; Heisler Park North; Main Laguna Beach; Laguna Beach at Ocean Avenue; Laguna Beach at Laguna Avenue; Laguna Beach at Cleo Street; Arch Cove at Bluebird Canyon Road; Laguna Beach at Dumond Drive; Laguna Beach at Lagunita Place/Blue Lagoon Place; Aliso Beach at West Street; Aliso Beach at Table Rock Drive; 1000 Steps Beach at PCH/Hospital/9th.

b) The appropriateness of the Water Quality Standards should be investigated, including whether a Use Attainability Analysis, Site-Specific Objective, or finding of Anti-degradation would be more appropriate. In particular, we are concerned about the appropriateness of the Shellfish beneficial use which is applied to all ocean waters irrespective of whether the area could support, is supporting or has ever supported shellfish populations. We would also request review of the REC-1 designation of all areas of the affected creeks, particularly with respect to the use definition which includes the statement "where ingestion of water is reasonably possible". There are many areas of the listed creeks which do not support, and have not supported this level of recreation; and

c) Alternative Regulatory Action consideration: The Regulatory Structure and Options policy states, "If a solution to an impairment is being implemented by a regulatory action of another state, regional, local or federal agency, and the Regional Board finds that the solution will actually correct the impairment, the Regional Board may certify that the regulatory action will correct the impairment and if applicable, implement the assumptions of the TMDL, in lieu of adopting a redundant program." The Aliso Creek watershed is currently under a 13225 Directive for bacterial indicators. The document does not address or recognize the redundancy of the TMDL and the requirements of the directive. Since there is an alternative enforceable program in place for this watershed, consideration should be given to removal of Aliso Creek from the TMDL process.

Response (a): Orange County, along with other municipal dischargers are commended for their success in restoring water quality at the beach segments listed in item a) above. Whether or not these beach segments meet WQOs during storm events is unclear, since the data submitted by the City of Laguna Beach consisted strictly of dry weather samples.

In a letter to the SWRCB dated January 31, 2006, the San Diego Water Board recommended that all waterbodies, regardless of quality during dry weather, remain listed if no wet weather data is available to demonstrate support of beneficial uses.

Even if the waterbodies in question are de-listed in the 2008 list evaluation, they will be included in this TMDL project. Please see the response to Comment 190 for further discussion.

Response (b): The Ocean Plan bacteria WQOs were revised in January 2005 by the SWRCB following a public review process. The San Diego Water Board has no basis to reject the Ocean Plan WQOs and use different ones. The State and Regional Water Boards are in the process of developing statewide bacteria WQOs for freshwater. The CEQA Scoping meeting and first public workshop for these statewide WQOs should be scheduled for the fall of 2007. Once adopted by the SWRCB, the San Diego Water Board will amend its Basin Plan to incorporate the statewide bacteria WQOs. If needed, the bacteria TMDLs will be revised to reflect any changes to the Basin Plan bacteria WQOs resulting from this statewide effort. We highly recommend that Orange County and all affected dischargers participate in the public review process on this action.

A Use Attainability Analysis (UAA) is not appropriately addressed in the TMDL process. States may remove a designated use, which is not an existing use, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible. To change existing Beneficial Uses there is a need to rebut the presumption that the use existed on or after November 28, 1975. The bacteria indicator WQOs are the benchmarks that will be used unless scientific studies show that alternative site-specific water quality objectives (SSO) are appropriate for the waterbodies involved in this TMDL project. At this time, we have no plans to change the beneficial uses of the creeks involved in this TMDL.

For the San Diego Water Board to consider SSOs, the SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of the waterbodies; and (3) be adopted by the San Diego Water Board in a Basin Plan amendment. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. As stated in the previous comment, progress on these TMDLs would not stop for the development and adoption of SSOs. The bacteria TMDL would proceed as outlined in the Implementation Plan and SSOs could be incorporated into the TMDL when they are adopted by the San Diego Water Board.

We disagree with the concern of the appropriateness of the SHELL beneficial use. As stated in section 3 of the Technical Report, SHELL includes uses of water that support habitats suitable for the collection of filter-feeding shellfish for human consumption, commercial, and sport purposes. Collection of shellfish for consumption along California's coasts and bays is well documented for both commercial and sport purposes. Pismo (*Tivela stultorum*) and 7 species of Littleneck clams (*Chione californiensis, Chione fluctifraga, Chione undatella, Protothaca laciniata, Protothaca staminea, Protothaca tenerrima,* and *Tapes philippinarum*) are commonly collected by sport fishers

and regulated by the Department of Fish and Game.[9] The Pismo clam's historic range is from Half Moon Bay, CA to Socorro Island, Mexico and five of the seven mentioned species of Littleneck clams are found in Southern California (DFG, 2001). Department of Fish and Game biologists concur with the SHELL use designation for the entire Pacific Ocean coastline in the San Diego Region.[10]

Response (c): We can only take the action suggested in this comment if the regulatory action is being implemented by another State, federal, regional, or local agency, not the San Diego Water Board. Since the efforts in the watershed have not been successful in attaining and maintaining WQOs, or evidence submitted that *anthropogenic* bacteria sources have been abated, we are not compelled to remove the watershed from the TMDL process.

Comment 34

The modeling of the TMDL does not appear to have followed the guidance prepared by USEPA's Council for Regulatory Environmental Modeling. This guidance describes best modeling practices needed to determine when a model can be appropriately used to inform a decision (USEPA, 2003). Using best modeling practices allows decision makers be more informed about the confidence that can be placed in model results. A model's quality to support a decision becomes known when specific information is available to assess these factors. The guidance specifies that model developers: 1) subject their model to credible, objective peer review; 2) assess the quality of the data they use; 3) corroborate their model by evaluating the degree to which it corresponds to the system being modeled; and 4) perform sensitivity and uncertainty analyses. The model used in this TMDL did not conform to the guidance in the following ways:

a) Data Quality Objectives for the modeling were not set. There was no discussion on how good the model needed to perform to inform the decision. There are "recommended criteria" for modeled hydrology shown in a table without a corresponding discussion on how these DQOs were set. In addition, model predictions were still used even when these "recommended" criteria were exceeded.

b) Model performance was not quantified. Calibration and validation of model performance are presented only as figures for a visual inspection. Some error analysis was conducted for the wet-weather hydrology, but not discussed. There are several statistical tests that could be used to describe model performance. Bias can be described with the median scaled residual. Precision can be described with root mean square error, median absolute deviation, scaled residuals, or relative error.

Response: Data Quality Objectives, as defined by the USEPA guidance document, refer to the quality and quantity of data used to develop and corroborate models.

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[9] Department of Fish and Game. 2001. California's Living Marine Resources: A Status Report. December, 2001.

[10] Robin Lewis and Bill Paznokas, Department of Fish and Game, personal communication, November 3, 2006.

Section 3.1.3.1 of this report states, "this guidance uses the term data uncertainty to refer to the uncertainty that is caused by measurement errors, analytical imprecision and limited sample sizes during the collection and treatment of data." Data Quality Objectives do not refer to pre-determined margins of error that the models must meet to be sufficient for regulatory decision-making.

The "recommended criteria" for quantification of model error in predicting hydrology were obtained from a U.S. Geological Survey report.[11] These were reported to provide a reference for evaluation of model error and were used as a guide for model calibration. However, these criteria were not used for determining whether model output was acceptable for prediction of historic flows and watershed loadings.

Model calibration and validation can be performed using both quantitative and qualitative techniques. Qualitative calibration and validation are often performed using graphical analysis, as was reported for both hydrology and water quality for the dry- and wet-weather models of the report. For hydrology, several analyses were reported (35 pages of results) for multiple watersheds that included graphical and tabular comparison of measured and observed flows and volumes. Additional statistical quantitative analysis can be performed for hydrologic results, but such an analysis would provide no indication of the conditions (e.g., high flows or baseflows) or time periods (e.g., seasonal storms) that impact model results, and include specific modeling parameters for characterization. The analysis of hydrologic model error based on volumetric comparisons provided sufficient evaluation of model error for purposes of this study.

Comment 35

Sensitivity and uncertainty analysis was not conducted. Sensitivity analysis evaluates the effect of changes in input values or assumptions on a model's results. The report does a good job of identifying all the modeling assumptions (Appendix L), but does not provide any information on the significance of these assumptions to the model results. Uncertainty analysis investigates the effects of lack of knowledge and other potential sources of error in the model. In this case, uncertainty analysis could be conducted on the empirical relationships used to estimate flows and bacteria concentrations. Due to the high variability, the model should be run using input values representing high and low confidence interval values. This approach would give a range of predicted values and could be used to explicitly define the margin of safety (MOS). Similarly, the simple empirical relationship used between fecal coliform with enterococci and total coliform should also undergo uncertainty analysis. Additional examples of areas where an analysis of variability and uncertainty should be presented include:

a) How sensitive are the results to the critical wet year assumption?

b) How sensitive are the results to the model's estimates of wet season bacterial loadings?

[11] Lumb, A.M., McCammon, R.B., and Kittle, J.L., Jr. 1994. Users Manual for an Expert System (HSPEXP) for Calibration of the Hydrologic Simulation Program--Fortran: U.S. Geological Survey Water-Resources Investigations Report 94-4168.

c) How sensitive are the results to seasonal changes and other site-specific conditions (such as temperature, UV light intensity, salinity, etc.) relative to the first order die-off coefficient for the bacterial indicators?

d) How is the variability and uncertainty of the MPN unit of measure accounted for?

Response: In the guidance document prepared by USEPA's Council for Regulatory Environmental Modeling, Section 3.1.3.3 states the following:

> "Uncertainty analysis investigates the lack of knowledge about a certain population or the real value of model parameters. Uncertainty is sometimes reducible through further study and with the collection of additional data. Existing Agency guidance distinguishes uncertainty analysis from methods that are used to account for variability in input data and model parameters. Variability in model parameters and input data can be better characterized through further study but is usually not reducible."

Evaluation of the sensitivity of modeling parameters was a key consideration during the model calibration process to provide modelers insight regarding parameters requiring adjustment. The LSPC model used for estimation of wet-weather flows and bacteria loads includes several parameters based on typical vales reported in literature and similar modeling studies in Southern California, as well as calibration to local datasets. To provide information recommended by the commenter on model uncertainty based on sensitivity analysis, many model input parameters would require adjustment based on high and low confidence interval values. However, such confidence intervals are not available for each parameter, which would result in an arbitrary selection of a confidence range (e.g., +/- 50% of the parameter value). As a result, sensitivity analyses would be informative regarding sensitivity of each input parameter, but ranges of predictive values are not directly transferable for determination of model uncertainty and a numeric MOS with confidence. Moreover, additional non-modeling assumptions were considered in the implicit MOS of the TMDL, and quantitative measures of each of these assumptions relative to modeling assumptions will also require further study.

The uncertainty in the modeling is acceptable for the regulatory decisions required in this TMDL which is based on the best available data and method of analysis. We acknowledge that the development of the bacteria TMDLs is characterized by data gaps and uncertainties. Scientific uncertainty is a reality within all water quality programs, including the TMDL program, and it cannot be entirely eliminated. The TMDL program must move forward in the face of these uncertainties if progress in establishing TMDLs and attaining WQOs in impaired waters is to be made.

However, we recognize that the additional sensitivity analyses, as recommended by the commenter, would provide additional information regarding variability and potential error in key model assumptions. To effectively measure these uncertainties, additional data collection and further study will be required. This is a typical procedure for model development and continued refinements to better quantify model uncertainty and focus future study on addressing key data gaps and information required for model refinement.

Most previous monitoring studies in the region were not focused on providing data for model development. Although sufficient for development of the models for the purpose of this TMDL, future refinements in monitoring efforts can focus on collection of datasets specific to addressing uncertainty analyses and quantification of a numeric MOS. If additional datasets become available, evaluation of model uncertainty can be considered in future study and may result in re-evaluation of the TMDL and the MOS.

Comment 36

The conservative modeling assumptions used for an implicit MOS should be quantified. The assumption of not applying mixing zone in the surf zone is significant to the allocations. This approach applies the marine SHELL standard to the mouths of the freshwater streams. The report should explicitly list each of the conservative assumptions used to form the MOS and (at least) discuss the relative magnitude of the assumption on the estimated loading capacity.

Response: The implicit MOS of this TMDL included both modeling and non-modeling assumptions outlined in Appendix L and section 8.1.7. For example, the assumption mentioned by the commentator regarding the lack of mixing zone in the surf zone was not a modeling assumption and is therefore not quantifiable using either the wet- or dry-weather model. All conservative assumptions used for the MOS are listed in Appendix L and section 8.1.7. To explicitly list relative magnitudes of each assumption on the estimated loading capacity would require an explicit, quantifiable MOS. An explicit MOS is not required for calculation of TMDLs.

Comment 37

Dry weather loading was estimated based on 'average' dry weather flows. Flow distributions are almost always log-normal with a left skew. Average (or mean) values do not represent the central tendency of the distribution. Median flow values should be used since mean flow values will greatly increase the loading due to higher assumed flow.

Response: The average flows calculated for the dry-weather model were based on dry-weather monitoring data collected from Aliso Creek, Rose Creek, and Tecolote Creek. These average flows were relatively small, ranging from 0.007 to 0.23 cfs. The differences between calculated median and average (mean) flows are less than 0.05 cfs, which are negligible. Moreover, the monitoring data are unlikely to be accurate within this range. Thus, average flows are acceptable for estimation of dry-weather flows in this study.

Comment 38

P. 5, Section 1.2, para. 3: the identification of MS4s as the primary source of bacteria does not acknowledge the fact that MS4s often act as conduits for background sources of coliforms such as wildlife and soils. The presence of bacteria in an MS4 does not automatically mean that all such bacteria derive from urban sources.

Response: We recognize that MS4s act as conduits for background sources of bacteria. Although MS4s are identified as the primary transport mechanism of bacteria discharges, we did not assume that all bacteria are derived from urban sources. The reference system approach, which will be incorporated into the Basin Plan permanently, accounts for discharges of bacteria from background sources. Loads that are generated by background sources were quantified for each watershed. These loads are assumed to be generated by the open space, open recreation, and water land uses. Loading from background sources was found to vary by watershed. For example, background sources account for about 60 percent of the fecal coliform loading to the Aliso Creek watershed, while only about 8 percent in the San Marcos watershed (Figures I-5 and I-10, Appendix I).

Dischargers are not required to reduce loads caused by background sources, even though these loads are eventually transmitted to receiving waters via MS4s. For each watershed, a total existing load was calculated that included loading from background sources. Dischargers are not required to reduce loads identified as originating from background sources (the highest loads demonstrated in the load duration curves in Appendix O). Dischargers are required to reduce the loads from urban sources (the remaining loads in the load duration curves that exceed the numeric target line and therefore exceed the assimilative capacity of the waterbody.) In this approach, the San Diego Water Board assumed that the highest loads generated in each watershed during a wet weather event are caused by natural sources, and therefore are not the responsibility of the dischargers.

Comment 39

The document apparently misses an opportunity to improve understanding of the reference watershed approach by comparing data from the San Mateo Creek and Arroyo Sequit watersheds. Such a comparison could have shown whether patterns of dry- and wet-weather exceedances differed. Conversely, if the data were not comparable (e.g., because sampling locations were fundamentally different), then this could provide guidance for the design of additional reference watershed sampling.

Response: The discussion regarding the San Mateo and San Onofre Creek watersheds suggested that these watersheds could be explored for the purpose of establishing a reference system applicable to the San Diego Region. Once a reference system is properly characterized and exceedance frequencies are quantified for wet weather flows, then a Basin Plan amendment will be adopted to establish implementation provisions for the purpose of calculating final TMDLs.

The data provided in Tables 4-1 and 4-5 were collected by the San Diego County DEH during routine monitoring as part of a wider beach monitoring program. These data were not collected for the purposes of characterizing a reference watershed during stormflow conditions and were for the most part collected during dry weather. In contrast, the data collected at Leo Carillo Beach at the mouth of the Arroyo Sequit watershed was collected primarily for the purpose of quantifying exceedance frequencies for this relatively undeveloped watershed during storm flow conditions.

Since the first draft of the Technical Report was available for peer review in February 2004, SCCWRP has completed one study looking at potential reference watersheds in

southern California.[12] San Mateo Creek watershed did not meet the criteria for a reference watershed because it does not have less than 95 percent undeveloped open space (more than 5 percent of the watershed has been urbanized).

In light of this newer information, comparing the data from the Leo Carillo Beach to the DEH data from beaches at the mouths of the San Mateo and San Onofre Creeks is not appropriate.

Comment 40

P.50, Section 5.3: The "statistical comparison of flow versus bacterial density" referred to here is exceptionally weak, with conclusions based on simple visual inspection rather than statistical analysis. In particular, Figures 5-5 and 5-6 are interpreted to mean that bacteria sources must be assessed during both wet and dry weather periods. However, other more important implications of the data are not addressed. For example, the right-hand portion of both figures shows little if any relationship between seasonal changes in river flow and bacteria levels at nearby beaches. In fact, for the riverine flow to consistently be the major source of the observed bacteria levels would almost require an inverse relationship between flow and loads. Because of the implications of the assumptions regarding flow versus bacterial density underlying this TMDL, such relationships should be investigated with formal statistical analysis.

Response: We agree that Figures 5-5 and 5-6 suggest that little if any relationship exists between seasonal changes in river flow and bacteria levels at nearby beaches. In fact, the purpose of including these figures was to demonstrate this variability. Because such variability exists between flow conditions and bacteria loading, evaluating this relationship using two distinct modeling platforms were necessary. By doing so, better modeling results were attained for dry weather flows.

The modeling analysis does not assume that there is a consistent relationship between flow and bacteria loads. Bacteria loads are assumed to be a function of land use types comprising each watershed, as discussed in the source analysis.

Comment 41

P. 51 Section 6.1 para. 4: The statement about the dependence of bacteria concentrations on land use is essentially lacking in content, and therefore not useful in evaluating the modeling approach and results. The description of the watershed model in the Appendix refers to a SCCWRP study and a Regional Board publication, but presents no actual data on bacteria loads from different land uses. Because these data are so key to the model results, this paragraph, or the Appendix, should present the estimates of loads from specific land uses and discuss their implications. For example, there should be a logical relationship between the relative magnitude of loads from urbanized and open space land

[12] Schiff, K., J. Griffith, and G. Lyon. 2005. Microbial Water Quality at Reference Beaches in Southern California During Wet Weather. Southern California Coastal Water Research Project Technical Report # 448. Southern California Coastal Water Research Project, Westminster, CA.

uses, the proportion of each watershed in open space, and the size of the background allowance for each watershed. In general, there is a lack of such internal consistency checks in the validation of the modeling assumptions.

Response: The SCCWRP modeling study referenced in the text provides documentation of the differences in monitoring data and resulting development of land-use-specific modeling parameters. The pie charts referenced in section 6.1.1 and provided in Appendix I provide much information regarding the relative magnitude of loads from land uses. These load estimates are based on model estimates that are impacted by land-use-specific modeling parameters, spatial distribution of rainfall and sources, and land use area in each watershed. Although allocation of loads to background allowances is relevant to the Source Analysis, quantification of these loads and discussion of identification of allowances are discussed fully in section 8 (Allocation and Reduction Calculations).

Validation of modeling assumptions specific to land uses was limited by the lack of land-use-specific water quality data collected in the San Diego Region. For this reason, modeling parameters were obtained from monitoring and modeling studies performed in the Los Angeles Region, and validated at a watershed scale for the present study. If sufficient land-use-specific monitoring data are collected in the San Diego Region to provide acceptable validation of modeling assumptions for each land use, the model can be validated further in the future.

Comment 42

P. 54, Section 7: This section, which describes the rationale for choosing between the steady-state and dynamic modeling approaches, is internally inconsistent. Steady-state models are described as best suited to streams dominated by point source inputs with impairment only under low-flow conditions. Dynamic models, in contrast, are more suited to streams affected by nonpoint sources or rainfall-driven flow and pollutant contributions. Preceding sections make it clear that the bacteria problem in watersheds in the San Diego Region occurs in both dry and wet weather and the document argues that bacteria loading is driven by the rainfall-mediated washoff of bacteria accumulated on land surfaces, a notably variable process. This would suggest that a steady-state model is not appropriate. However, on the basis of an unsupported assumption that the Region is "dominated by nonpoint sources that are generally constant on an hourly time step and deposit directly to drains," a steady-state modeling approach is chosen. There is no documentation given for this assumption about the behavior of nonpoint sources, nor is there any reference to more detail in an Appendix. In fact, available data show strong variability in flow and bacteria levels over the course of a day. The conclusion that the nonpoint sources can be treated as point sources is thus simply an assertion, and it seems that this decision may have been motivated instead by the availability of data. Given the rather significant management implications of the TMDL targets, which are based on modeling results, this level of justification for a major technical decision is inadequate. The evidence for the "generally constant" behavior of nonpoint sources should be presented and the sensitivity of the modeling results to different technical approaches should be investigated.

Response: The statement that the "document argues that bacteria loading is driven by the rainfall-mediated washoff of bacteria accumulated on land surfaces, a notable variable process" refers to wet weather conditions when rainfall occurs. The steady-state model is used to represent streams during periods of no rainfall when flows are less variable. We have acknowledged that under dry conditions, dry-weather flows also exhibit variability that is not simulated by a steady-state model. Regardless, the steady-state model provides simulation of average conditions that are comparable to the dry-weather numeric target based on the 30-day geometric mean WQOs. If variable minimum and maximum daily dry-weather flows and bacteria concentrations were predicted, this would also require comparison to numeric targets based on single sample maximums. Such variability is expected to be watershed-specific, and therefore should be based on data collected in each watershed for accurate estimation of ranges. If additional data are collected through further study to provide prediction of daily ranges of bacteria loads for each watershed, we will consider re-evaluation of the TMDL.

The assumption in the comment that the Region is "dominated by nonpoint sources that are generally constant on an hourly time step and deposit directly to drains" refers to wet weather, for which a LSPC model was developed that provides hourly predictions of flow and bacteria concentrations assumed constant during each hourly time step. This does not refer to an assumption used in selecting a dry-weather modeling approach, as stated by the comment. The text has been clarified to this effect.

For all models, simulation of receiving waters such as rivers requires assumptions for specific locations for inflows and associated bacteria loading from watershed runoff. In the current study, model development for wet and dry periods required estimation of sources from runoff that were simulated as discharges to the receiving waters (rivers) at specific locations. In this way, nonpoint sources are treated like point sources within the modeling domain. This is a basic assumption for model development and is not based on data availability, nor does such a basis need to be established since this is a basic concept for model development.

The steady-state approach for defining dry-weather flows and bacteria loads is acceptable and adequate for loading assessment and TMDL calculation. A steady-state approach for prediction of dry-weather flows is typical for source assessments used in TMDLs. Similar modeling approaches have been used for calculation of TMDLs in the Los Angeles Region where dry-weather runoff is also common, including TMDLs for Ballona Creek and Los Angles River, and models currently under development by USEPA for estimation of dry-weather loads to San Gabriel River and Los Angeles and Long Beach Harbors.

Comment 43

P. 58 Section 8.1.1, para. 3: The selection of the baseline year for modeling wet year loads is critical. It would be useful to see model runs that show the sensitivity of the TMDL targets to different rainfall years. As it stands, the choice of this particular year seems arbitrary.

Response: The critical wet year was the wettest year of the model simulation period based on rainfall data used to develop the wet-weather model. The model simulation period was from 1990 through 2002. Year 1993 was characterized with the most rainfall, and produced more flows and resulting loading of bacteria to receiving waters than any other year during the simulation period. Since the TMDL must provide protection of receiving waters during all periods when the designated use is applicable, including periods most impacted by watershed flows, the wettest year was used as the critical period for TMDL calculation. Reduction in bacteria loads calculated based on the critical wet year provides assurance that load reductions will be sufficient during all periods. The same critical wet year was used in calculation of TMDLs for Santa Monica Bay Beaches in the Los Angeles Region. Therefore, selection of this critical period was not arbitrary.

Comment 44

This section reflects an incompletely developed conceptual model of background or natural sources of bacteria. The conceptual model implicit here and in other places in the document is that bacteria from natural sources enter receiving waters either directly (e.g., waterfowl) or as the result of runoff directly into receiving waters from open space. The possibility that bacteria from natural sources could enter MS4s is apparently not considered and/or accounted for. The only way the statements in the document can be understood to be logically consistent is as follows:

- Natural sources are uncontrollable.
- Sources from urban runoff associated with MS4s are controllable. Therefore, natural sources do not contribute to urban runoff in MS4s.

However, this does not account for observations that:

- Wildlife (e.g., rabbits, skunks, coyotes, birds) frequent developed areas and bacteria from their droppings enters the MS4 via runoff after rain
- MS4s in many locations drain combinations of urbanized and open space, for example, where development abuts open space and runoff from the open space flows onto streets and then into the MS4
- Portions of the MS4 (e.g., stormdrains and channels) are used as habitat by some species of wildlife.

Assuming that these sources are controllable simply because they end up in the MS4 is simplistic and is unrealistic.

Response: This comment incorrectly states that the possibility that bacteria from natural sources could enter MS4s is not considered or accounted for. Bacteria loading was modeled as a function of land use, and all land uses have both natural sources (wildlife) and anthropogenic sources of bacteria. Once pollutants are washed into an MS4, municipalities are responsible for these pollutants in the waste stream discharged from the MS4s. The commenter misunderstands the application of the reference system approach. See the response to Comment 38.

We recognize that MS4s act as conduits for background sources of bacteria. Although MS4s are identified as the primary source of point source discharges, that all bacteria are derived from urban sources is not assumed. The reference system approach allows the San Diego Water Board to adopt a TMDL that allows a certain exceedance of WQOs attributed to natural sources. The TMDLs also allocate loads to uncontrollable non-point sources assumed to be generated mostly on open space land. If a significant portion of the loads generated on open space are transmitted to receiving waters via MS4s, then that portion of the load allocated to uncontrollable non-point sources could be reallocated to the municipal dischargers. Information is needed to quantify such a reallocation.

Comment 45

P. 58, Section 8.1.1: The justification for the selection of the critical wet-weather condition is not logical. Flows in creeks and rivers in southern California during "extreme wet conditions" are high and rapid, the ocean environment off creek and river mouths is turbulent and dangerous, and REC1 use at these places and times is highly unlikely. In fact, anyone engaging in body contact recreation under these conditions might well run a much higher risk of drowning than of illness from exposure to contaminated water. Standard risk management approaches typically focus on circumstances in which risk is highest, generally assessed as a combined function of the level of hazard and the number of people exposed. While the level of the hazard in the wet-weather critical period is high, the number of people exposed is most probably extremely limited. Therefore, the justification for using this period to set the TMDL targets, with their attendant consequences for management policies and implementation costs, is weak.

Response: We disagree that the selection of the critical wet-weather condition is not logical. The bacteria TMDLs must ensure that WQOs are met in all conditions and at all times. The critical wet-weather condition was selected because this period would produce the highest possible load from the watershed. Furthermore, the scientific peer review panel did not have any issues with the use of critical wet weather conditions. Both reviewers commented that the use of a single-sample maximum for the wet weather targets is a reasonable approach. See Appendix A, responses to Item 4.

The REC-1 beneficial use is a component of a water quality standard and is not intended to be used as a risk management index that calculates a level of risk. The bacteria TMDLs will not address issues dealing with the appropriateness of existing REC-1 beneficial uses or the bacteria water quality standards in the Ocean Plan. These types of issues are more appropriately addressed by amending the WQOs in the Ocean Plan through the formal amendment process.

The commenter should also keep in mind that the wet weather TMDLs address not just the period of the storm, but the 72 hours after cessation of rainfall when bacteria levels remain high at beaches. Weather can improve significantly within 1 to 3 days of a storm, so the assumption that inclement weather keeps swimmers out of the water during storm flow conditions is not entirely correct.

Comment 46

P. 59, Section 8.1.4: The fundamental assumption underlying the location of the critical point, i.e., that "bacterial densities are assumed to be greatest" at the "mouths of the watersheds" is not supported by reference to any data presentation or process model. If this is a prediction of the modeling, it should be so referenced. However, this is not consistent with available monitoring data. For dry weather, the extensive Aliso Creek monitoring data showed that densities were consistently higher in the upper reaches of the watershed, where the ratio of discharge input to ambient flow is highest and where die-off has not yet had much opportunity to affect bacteria populations. Given the Aliso Creek data, it is not logical to assume that compliance with WQOs must be "maintained for all segments of a waterbody to ensure that impairments of beneficial uses are not observed." There are many plausible scenarios in which a combination of spatially heterogeneous bacteria input combined with progressive die-off might lead to meeting WQOs at the mouth of the watershed.

Response: The assumption for the critical point was not a modeling assumption, but rather a conservative assumption specific to TMDL calculation. The higher bacteria concentrations referred to at the mouths of watersheds refer to data collected at beaches and creeks. A robust analysis of these data is discussed in section 5.2, with maps presented in Appendix H showing spatial variation in observed ranges of indicator bacteria. These results showed that higher bacteria densities are common in the vicinity of the mouths of creeks and major stormwater outfalls.

We agree that concentrations within streams throughout a watershed are not likely consistent with concentrations at the mouths of watersheds at the critical point used for TMDL calculation. The longitudinal variation of bacteria densities within streams resulting from various sources and instream die-off was considered in development of models for dry and wet weather. Regardless, a single point for TMDL calculation was determined for each watershed, thus resulting in a "watershed approach" for calculation of the TMDL, wasteload allocations, and necessary load reductions. Otherwise, separate TMDLs would require calculation for each subwatershed throughout the region shown in Appendix E, which would create unnecessary detail and confusion since this includes over a hundred subwatersheds.

Comment 47

P. 68, Section 9.1.1: The text states "Comparing the final wet weather allowable loads to the loads allocated to uncontrollable sources shows that, in every watershed, the uncontrollable nonpoint source allocation is greater than the TMDL. This indicates that the natural bacteria sources in the watersheds consume and exceed the assimilative capacity of the creeks, resulting in allocations of zero loads to all remaining sources, namely controllable point and nonpoint sources." This being the case, water quality objectives will not be met during wet weather regardless of control efforts taken by dischargers to control urban discharges. This calls into question the need for designating wet weather reductions and the benefit to be gained from the expense incurred through BMP installation and maintenance.

Response: Bacteria loading from urban creeks should be reduced even though open space loading exceeds the capacity of the creeks and beaches because pet waste and human sewage are more likely to occur in urban runoff. We recognize that it will be difficult for dischargers to meet final allocations and WQOs during wet weather. Therefore, we are developing a Basin Plan amendment to permanently incorporate a reference system/natural sources exclusion approach for implementing bacteria WQOs, as described in the response to Comment 2.

Comment 48

P. 94, Section 10.2.3: The text states, "Excess fertilizers and **irrigation runoff** (emphasis added), as well as rainfall runoff, can wash bacteria and sediments off properties into nearby waterways." This contradicts previous statements that dry weather allocations for sources other than MS4s were not necessary due to the lack of flow to transport bacteria to waterways. Dry weather allocations should be developed for identified nonpoint source dischargers. This comment applies to Agricultural fields, orchards, and dairy/intensive livestock and horse ranch facilities.

Response: The statement that irrigation runoff can wash bacteria into nearby waterways is meant to identify a potential, not actual, bacteria source and/or transport mechanism. Whether or not bacteria loads are definitively generated by irrigation runoff is unknown.

Dry weather allocations may be developed for nonpoint source dischargers if it is found that irrigation runoff volume is comparable to urban runoff volume. Such a determination will be made only after steps are taken to enforce applicable WDRs and waivers. Please see the response to Comment 23.

Comment 49

Table 5-5 – Summary of Enterococci Data for Impaired Creeks – The County of San Diego requests the removal of Pine Valley Creek as it is not part of this TMDL.

Response: Table 5-5 has been modified as requested.

Comment 50

Executive Summary. Numeric Target Selection. We recommend that this section be revised for clarity. The use of the Interim TMDL is introduced in the second sentence and should be explicitly defined here; that it allows for the natural, largely uncontrollable sources of bacteria. A measurement of a reference watershed, one that is minimally impacted by human activities, serves to determine the natural sources of bacteria. The details of the interim TMDL then can be explained in the third paragraph by first stating that it is based on the reference system in Los Angeles County and then citing the 22% exceedance frequency of occurrence for the WQOs. The report should indicate whether the Los Angeles County reference system will be used or whether a San Diego based reference system will be developed and used instead. We question the use of the Los Angeles County reference system without adequate validation for this region. The Board has announced that a CEQA scoping meeting is scheduled in March of this year for an

amendment to the Basin Plan to incorporate the reference system. The selection of a validated, specific reference system would have to be in the amendment.

Response: The Executive Summary has been modified for clarity. In particular, the text has been modified to state that, if the proposed Basin Plan amendment authorizing the use of a reference system approach is adopted and approved, final TMDLs will be recalculated that will allow WQOs to be exceeded based on the frequency of exceedance of WQOs in a reference system. The Basin Plan amendment will not specify which reference watershed(s) or exceedance frequencies are appropriate for wet weather TMDL calculations. Designation of an appropriate reference watershed, for purposes of calculating TMDLs, will take place in a case-by-case basis. As more reference systems are studied and characterized, the San Diego Water Board will be better able to match an urbanized watershed with an appropriate reference system.

Comment 51

The report should address the bacteria loads from onsite wastewater treatment systems (e.g., septic systems). The State Water Resources Control Board has recently conducted hearings on the provisions of AB 885 and has prepared several reports. One that is of interest is the "Onsite Wastewater Treatment System Repair of Failure/Malfunction Survey, January 2003". The survey reports that 500 systems in San Diego County required repairs. We can expect an increase in housing along with the number septic systems in the rural areas of the County. Consequently, the implementation plan should have measures to minimize septic system failures to assure conformance with the load allocations. This is a different situation from POTWs as there is no formal, regular monitoring of these septic systems.

Response: The Technical Report was revised in the March 9, 2007 version to address septic systems. Section 10.2.3 now includes a discussion of septic systems as a potential nonpoint source of bacteria, and owners of individual septic systems are identified as persons responsible for controllable nonpoint source discharges in section 10.4. Additionally, section 11.5.5 has been modified to state that the San Diego Water Board will implement load reductions from nonpoint sources by enforcing waivers with respect to conventional septic systems, subsurface disposal systems for residential units, commercial/industrial establishments, and campgrounds, and waivers for alternative individual sewerage systems.

Comment 52

Section 8.1 Wet Weather Loading Analysis refers the reader to Appendix N for a comparison of the modeling results to observed bacteria densities. Figures N-1 to N-11 compare the time series of observed and modeled data. These results do not reveal very good model fidelity. Figures N-12 to N-24 chart the percentile unit area flow per day for the observed with the modeled data for fecal coliform, total coliform and enterococcus. Here the fidelity of the model varies from poor to good. The text should provide the reader with a candid evaluation of the modeling results. What are the expected errors? Does the margin of safety assigned in the TMDL account for the model errors?

Response: The comparisons of model results to observed bacteria densities shown in Figures N-1 through N-11 of Appendix N show acceptable model fidelity for this study. Recall that bacteria modeling parameters were obtained from a robust calibration process performed by SCCWRP based on detailed storm-specific water quality data collected from homogeneous land use sites in Los Angeles. Similar detailed datasets are currently not available in the San Diego Region to provide consistent evaluation of model simulation of land use sources. Therefore, the present study relied on the previously calibrated values, which were validated based on instream data shown in Appendix N. All bacteria data collected in modeled watersheds were utilized for this validation process, although datasets consisted of grab samples or storm composite samples at locations and frequencies that were not sufficient for detailed comparison with model output. In addition, data collected at specific locations, often at the bottom of a watershed below a large area with multiple land uses, did not include significant datasets to justify refinement of land-use-specific modeling parameters.

Where data were not collected at consistent locations of model subwatershed outlets, data collected throughout the subwatersheds were pooled and relative ranges of observed bacteria densities were compared with ranges predicted by the models at the subwatershed outlet. The results shown in Figures N-12 through N-24 provide an analysis of the general trends, but were not used to support or justify calibration of modeling parameters. Regardless, comparisons in Figures N-12 through N-24 were provided in an attempt to utilize all data collected in the region, although these datasets may not be suitable for robust model calibration, nor was the purpose for their collection associated with watershed model development. However, results of these comparisons show the dependence of both model results and observed data on flow magnitudes, which were normalized in these figures based on watershed area. Except for lower flow ranges, the general trend of model results and observed data appear to be consistent relative to the flow. To address low-flow periods that were not predicted with accuracy based on LSPC, a separate modeling approach was developed.

Previous monitoring plans were not focused on collection of data required for calibration or validation of watershed models. Regardless, results of the model validation for water quality were reported in Appendix N to provide indication of the accuracy of the model. Not enough water quality data were available in each watershed to provide meaningful evaluation and quantification of model error based on statistical calculation. Evaluation of model error is also confounded by the highly variable bacterial concentrations (levels often vary by multiple orders of magnitude), which impact statistical calculations. Hydrologic model uncertainty also impacts model error in load prediction, which were evaluated separately in Appendix M. Due to the complexity in evaluating model error for each watershed, model error is not included explicitly in the TMDL margin of safety. Rather, an implicit margin of safety was assumed resulting from multiple conservative assumptions listed in Appendix L and section 8.2.5.

Comment 53

Section 6.2, 6.3, Point/non-point sources. Landfills, active and post closure, are not listed. Solid wastes contain animal wastes, pathogens, and may contain sewage sludge.

A review of the monitoring and reporting requirements of several landfills in this region do not contain bacterial monitoring of surface runoff. Explain why landfills should not be listed as a source.

Response: We concur that landfills are a potential bacteria source, therefore, the Technical Report was revised in the March 9, 2007 version to include a discussion pertaining to the possibility of landfills as a bacteria source.

Comment 54

Source analysis and bacteria re-growth issue. During the SAG meetings, bacteria re-growth in wrack lines, storm drains, culverts, and streams was discussed. The report, section 7.1.1.d, Constituents, states that bacteria concentrations are influenced by several factors including re-growth. However, Appendix L Assumptions states that the wet and dry weather models assume zero re-growth based on lack of data or literature. Were computer studies conducted to evaluate the influence of re-growth on the results? Were sensitivity studies conducted with bacteria die-off rate set to zero? A study conducted at the University of Alabama at Birmingham on the survivability of pathogens indicates that computer models using first order die-off rate of indicator bacteria may be an oversimplification. A report by the Regional Cooperation for Water Quality Improvement in Southwestern Pennsylvania in Southwestern Pennsylvania indicates that re-growth of bacteria adsorbed in sediments occurs and indicator bacteria concentrations can rise sharply with resuspension of sediment in streams in warm climes.

Response: Bacteria re-growth is a complex process that must consider site-specific features of a watershed for estimation (e.g., temperature, organic material). Information for quantification of re-growth is not available for all watersheds in the region modeled in this study. As a result, assumptions were required to provide consideration of potential re-growth in the models.

We assumed bacteria re-growth occurs predominately during dry periods when stream velocities are low and travel times are longer, providing sufficient opportunity for re-growth to occur before discharge to coastal waters. Therefore, wet-weather models did not include re-growth, but rather assumed a first-order die-off rate based on literature values. For dry weather, the steady-state models were calibrated to determine a "net" die-off rate to assume for all streams (Appendix K). This calibration process was based on changes of observed bacteria levels occurring longitudinally in streams (where/when bacteria data were available), which are subject to many complicating factors that can enhance or impede die-off rates, or even be offset by potential re-growth. Regardless of these complicating factors, a net reduction rate of bacteria was calibrated. Although these net rates are assumed to result primarily from die-off, additional factors such as re-growth are also assumed to be incorporated implicitly within these values. As a result, if re-growth is present within those streams used for calibration of net die-off rates in the dry-weather model, this will essentially result in net die-off rates that include both die-off and re-growth in their value.

As additional data are collected through further study to determine site-specific bacteria die-off and re-growth rates for each stream modeled in the region, the dry-weather model

can be updated. Until such data is available, we believe that the present assumptions for bacteria die-off and re-growth are sufficient for both wet and dry conditions.

Comment 55

Section 10.3, 10.4. Landfill operators, both active and post closure, should be listed as dischargers.

Response: Section 10 of the Technical Report describes the legal authority for the implementation plan, including identification of dischargers. This section has been revised in the March 9, 2007 version of the Technical Report to identify landfill operations as potential (not known) bacteria sources. Because landfills are potential bacteria sources, landfills are discussed in section 11 under "Additional Actions" by the San Diego Water Board. This section describes actions we will take to determine whether or not landfills contribute significant bacteria loads to impaired waters.

Comment 56

Page 101, Section 11.3.3 states that only one WLA is assigned to the municipal dischargers in each watershed. This requires the municipal dischargers to be collectively responsible for meeting the WLA. Because computer modeling was used in developing the WLAs, will these municipal dischargers have access to and assistance in using the computer models as a tool to evaluate their management strategies and BMPs?

Response: The municipal dischargers, and other interested persons, will have access to the computer models as a tool to evaluate their management strategies and BMPs.

Comment 57

The USEPA is concerned that the units for the TMDL and allocations are expressed as number of bacteria colonies "per year" rather than "per month" or "per day."

Response: Wet weather TMDLs are best expressed as an annual load because of the extremely high daily variability in storm flow magnitude and loading in the watersheds addressed by these TMDLs. The variability in the modeled daily loads is evident in the load duration curves in Appendices O and P.

We agree that the dry weather TMDLs are better expressed as monthly loads rather than annual loads. This approach makes sense because the numeric targets are equal to the 30-day geometric mean WQOs, and the dry weather model simulates average flows. Tables 9-3, 9-6, 9-7, and 9-10 were updated or created in the August 4, 2006 version of the Technical Report to express the dry weather TMDLs as monthly loads.

Comment 58

The TMDL needs to develop load and waste load allocations for all identified sources of bacteria for both dry and wet weather. Only wet weather loadings have been developed for controllable and uncontrollable non-point sources. This erroneously ignores irrigation practices on agricultural areas during dry weather and documented

natural dry-weather base flow and bacteria in perennial creeks in the watersheds. Despite this consensus, no change was made for dry-weather conditions in the Revised Draft, presumably due to perceived data gaps. Substantial research efforts on natural uncontrollable wet- and dry-weather loads are currently being conducted by the Southern California Coastal Water Research Project, and full findings will be available within another two to three years. For example, the SCCWRP work will help address the need for determining a natural exceedance-day percentage for *creeks* under wet-weather conditions (the exceedance-days allowance currently incorporated is based only on *beach* data). Based on the Final TMDL modeled calculations of uncontrollable natural loads, the natural *creek* wet-weather exceedance rate could be expected to be closer to 100% than to 22%. It is critical that this and many other data gaps and scientific findings, such as land use changes since 2000 and improvements in tracking actual pathogens, be acknowledged. As concurred by the entire SAG, ***the Implementation Plan should include a time period to collect the data necessary to enable the model to simulate a more accurate representation of each watershed. Once the additional data have been collected, the plan should commit to a recalibration of the model and a re-evaluation of the TMDL targets, load and waste load allocations. The Report should clearly establish a commitment to re-evaluate and re-calculate the TMDLs on a five-year schedule.*** Establishing a pre-set re-evaluation commitment would avoid the probability of individual watershed stakeholders requesting piecemeal reviews and straining the time and resources of both the RWQCB and the public. Without a specific commitment in the Report to re-calculating the TMDLs, permittees cannot be assured that RWQCB resources will be committed to this effort. This issue is critical enough that we anticipate that the MS4 permittees would be more than willing to commit their own resources to the re-evaluation efforts.

Response: We developed LAs and WLAs only for the significant sources of bacteria (allocations were not developed for insignificant sources of bacteria for dry weather TMDLs). The rationale for doing so is explained in the response to Comment 23. Nonetheless, the Implementation Plan requires that agricultural operations comply with WDRs or the waivers of WDRs for irrigated agriculture. Enforcement of WDRs and waivers should ensure that loading from this source is minimized.

We recognize that the models used for TMDL analysis could be improved with additional data, and that the models produce the most accurate results when the latest and best information, such as the results of SCCWRP's reference watershed study, is utilized. However, attempts to restore water quality and meeting the TMDLs as calculated must not be delayed for acquisition of new information. Even as new information is being sought, attempts to decrease existing bacteria levels must take place, since bacteria contamination is indicative of a public health risk. Available information indicates that high bacteria densities have persisted in the beaches and creeks included in this project. Even if new data and information is obtained that result in more accurate model and TMDL results, chances are that significant load reductions would still have to take place. As the waterbodies included in this project have been on the List of Water Quality Limited Segments for years, there is no reason why dischargers cannot begin or continue with attaining load reductions immediately.

We will recalculate TMDLs after the reference system approach/natural sources exclusion Basin Plan has been adopted. However, we cannot commit to reevaluating the watershed models. TMDL recalculation based on new models will occur when data exist to fill gaps and in accordance with San Diego Water Board resources and priorities. However, interested persons can request the San Diego Water Board to initiate the Basin Plan amendment process to incorporate new information at any time, as described in section 2.3 of this appendix.

Alternatively, dischargers are encouraged to formulate a workplan for model refinement. The purpose of this workplan would be to identify and generate information that could be used to refine the models used to calculate TMDLs. This information could consist of, for example, water quality data, flow data, and land use data. This workplan would be written and executed by dischargers, with oversight participation by the San Diego Water Board. Additionally, if San Diego Water Board resources are not available to prepare a TMDL Basin Plan amendment, workplan participants could lead a third-party TMDL effort. For example, the SAG could draft the TMDL documents, leaving staff the job of taking the TMDLs through the Basin Planning process.

Information obtained in a Model Refinement Workplan may or may not overlap with information obtained as required by the Bacteria Load Reduction Plans discussed in section 11.5 of the Technical Report. A suggested series of steps involved with a Model Refinement Workplan is discussed below.

1. **Development of Workplan and Identification of Participants**. Dischargers in watersheds subject to this TMDL who are interested in model refinement would submit a Model Refinement Workplan that describes what information is to be gathered, who is participating in the effort, and how this information is to be utilized for model refinement and TMDL recalculation.
2. **Identify Funding Sources**. Participants in the Model Refinement Workplan would identify funding sources for the needed work, including grant opportunities from the State Water Resources Control Board or the USEPA.
3. **Data Collection**. Participants in the Model Refinement Workplan would collect data to fill identified data gaps in the TMDL models. This could consist of, for example, flow data, water quality data, and land use data.
4. **Model Execution**. Once a sufficient amount of data has been collected, workplan participants could reconfigure and/or re-run the computer models, or hire a contractor to perform this task.
5. **Lead a third-party TMDL effort**. If staff resources from the San Diego Water Board are not available to prepare a Basin Plan amendment to incorporate modified TMDLs, then the workplan participants could coordinate this effort via a third-party agreement with the San Diego Water Board.

Refinements to the computer models as a result of such efforts would not necessarily be limited to recalculation of bacteria TMDLs. The computer models used for development of the bacteria TMDLs could also be used to calculate TMDLs for other pollutants. For this reason, we encourage the collection of data for other impairing pollutants in addition to bacteria.

Comment 59

Page 33, the document indicates that WQOs are expressed as the most probable number (MPN) of bacteria, many of the existing monitoring programs which are referenced in the document express indicator bacteria in CFUs. In terms of evaluating compliance, we consider these equivalent, unless otherwise advised.

Response: We agree with the comment and therefore consider the alternate metric for measuring bacteria, "colony forming units" (CFU), equivalent to "most probable number" (MPN).

Comment 60

It is unclear how the Total Maximum Daily Loads correspond to each of the Model Subwatersheds and Hydrologic Descriptors identified in Tables in Section 9.

Response: The TMDLs do not correspond directly to each model subwatersheds, but rather are the sums of the allowable loads for each of the model subwatersheds. An "allowable loading" was calculated for each of the subwatersheds (the delineations of the subwatersheds are shown in Appendix E). The subwatershed identification number originates from the numbering system used in model development for tracking the routing of flows and bacteria loads through the watersheds. For example, the San Clemente hydrologic area is composed of subwatershed numbers 501-506. The allowable bacteria loading calculated for each subwatershed was then summed to produce a TMDL for the entire watershed, which are reported in Tables 9-1 through 9-12.

Comment 61

The maps provided in Appendix E should include more information, such as jurisdictional boundaries, major roadways for reference, waterbody names for reference, etc. The County may be able to provide this information.

Response: The subwatersheds were modeled to calculate allowable bacteria loading for each watershed as a whole. The maps in Appendix E show the subwatershed boundaries only. Although additional information on the maps may be desirable, the maps are adequate for their purpose. Considering the time constraint, we will not update these figures.

Comment 62

The Report should reflect all current work/studies as of date of writing, for example, the reference beach study for the San Diego Region should be included in this TMDL document at this time.

Response: The reference beach study to which the commenter refers has been cited in the Technical Report. All relevant work to date that has a direct impact on these TMDLs has been cited.

Comment 63

Wet Weather Model Selection. The EPA supported LSPC watershed runoff model, based on the Hydrologic Simulation Program Fortran (HSPF) (Bicknell et al., 1997; 2001), was used to simulate a continuous multi-year time series of streamflow, land use dependent bacterial loading and bacterial transport and fate in the streams of the San Diego Region watersheds of the study. The watershed model framework of LSPC, and its predecessor model (HSPF), is well known and has been subject to several peer reviews to ascertain the technical credibility of the mechanistic and empirical approaches adopted in the model.

The selection of *LSPC as the wet weather model for bacterial loading, transport and fate is appropriate for the data sets available, the determination of TMDLs and the load allocation objectives of the analysis.*

Response: Comment noted.

Comment 64

Regional Land Use Data. Watersheds of the San Diego Region were delineated as 16 sub-watersheds with 13 of the watersheds containing impaired reaches. Three watersheds were included because of an abundance of bacterial data that could be used to support calibration of the model. Land use was represented using data obtained from 3 different data sources. San Diego County (SANDAG) land use was the primary source with land uses as of 2000. The San Diego database was supplemented with data obtained from the Southern California Association of Governments (SCAG) for Orange County and portions of Riverside County. The effective year identified for this land use data source is not given in Appendix J. Minor data gaps in land use coverage were assigned using a 1993 USGS Multi-Resolution Land Characteristics database.

Of the numerous land use categories reported in the databases, detailed land uses with similar characteristics were combined for a total of 13 land use categories defined for the San Diego Region model. The 13 land uses represented in the study consisted of the following non-urban categories: agriculture, livestock, horse ranches, open space and surface water. Urban categories included low-density residential, high- density residential, commercial/industrial, industrial/transportation, Caltrans (roads), military facilities, parks and recreation, and construction sites (transitional).

The temporal resolution of the land use data sources (i.e., ca. 2000) is typical of many watershed modeling studies and appears appropriate for development of a regional scale watershed model. As more recent land use data becomes available, the land use distributions used in the model framework can be adjusted, if needed, to revisit the TMDL calculations in the future. For the regional scale model, t*he level of detail of the various land uses appears adequate to represent watershed runoff and bacterial loading in this region. More importantly, the level of detail of the land use categories appears adequate to provide the information needed to municipal officials and other land owners to design and implement BMPs to achieve the waste load allocations and load allocations determined from the TMDL modeling study.*

Response: Comment noted.

Comment 65

Local Scale Land Use Data for San Marcos Basin (1101). *For Cottonwood Creek in Encinitas, included in the San Marcos Watershed (1101), the land use characterization of agricultural uses (0.06 square miles; 4.2 %) and livestock/dairy operations (0.25 square miles; 17.5%) extracted from the land use data sources may not accurately reflect contemporary land use conditions in this small sub-watershed (1.43 square miles). Land use in this watershed is dominated by urban uses with the heavily used I-5 corridor running north-south in the central portion of the sub-watershed. Although agricultural land uses were historically important in this area, there has been pronounced transformation of once agricultural lands to urbanized uses over the past several years. The assignment of the correct drainage areas for agricultural and livestock dairy operation land uses in this small watershed is a critical issue to resolve since the 53% proportion of fecal coliform bacterial loading estimated for these non-urban land uses is quite high (see Table I-12) and affects the calculation of load reductions for this watershed. It is recommended that more recent land use data be collected and compiled to match the 13 land use categories adopted for the San Diego Region watershed model.*

Response: The model results for the San Marcos watershed can be revised with updated land use information in a future refinement of the TMDLs. Time and resources do not permit us to remodel the San Marcos watershed at this point.

Comment 66

Hydrologic Calibration of Watershed Model. The hydrologic model is calibrated to flow data collected from 1991-1996. The model is then validated to data collected from 1997-2001. Model performance targets are also given in Appendix M as relative error statistics for the 10% highest flows (15%) and the total storm volume (20%) to document the ability of the hydrologic model to represent high flow/wet weather conditions.

As shown in time series plots of model results (Appendix M), the hydrologic model appears to be well calibrated to simulate daily and monthly high flows, the winter-summer pattern of high and low flows, and the seasonal variation of monthly streamflow for many of the watersheds of the study. For most of the watersheds, the performance targets are achieved for both the calibration and validation periods. The ready availability of hydrologic parameters values calibrated for other Southern California watershed models of the San Jacinto River and Santa Monica Bay undoubtedly were of great assistance to the model developers in calibrating parameter values for the hydrologic model of the San Diego Region watersheds.

In addition to the time series plots of the model-data comparisons for the different watersheds, flow duration curves for model results should be shown to allow for comparison to the observed flow data. This information would help to determine if low flow characteristics, such as baseflow, of the watersheds were adequately represented by the calibration parameters of the hydrologic model. A detailed analysis of urban runoff in Cottonwood Creek (City of Encinitas, 2002), for example, concluded that a

considerable component of dry weather flow in the lower reaches of Cottonwood Creek was groundwater derived (i.e., baseflow). A hydrologic model that is run continuously for multiple year time scales, as was the San Diego Regional model, should be capable of adequately reproducing seasonal cycles of wet and dry periods to represent the complete range of flows from low to high flows. A simple visual comparison of the time series model-data plots suggests that the hydrologic model does, in fact, represent the lower flows fairly well. Presentation of the relative error statistics to show the model performance at all flow ranges, including mid and low flows, would be desirable. The presentation of model-data flow duration curves then serves to visually support the model performance statistics over the entire flow range for a watershed.

Response: Flow duration curves were developed for calibration and validation and were used internally for verification of necessary model refinements, but were not included in the report in an effort to reduce unnecessary volume of appendices, and ease the review process. Regardless, these flow duration curves are only relevant for assessment of wet flows, as dry flows associated with urban runoff were not simulated by the model for the TMDL. Instead, a separate model was developed to account for dry conditions, which was discussed in the report. To provide representation and review of LSPC model performance across multiple flow magnitudes, we considered time series plots to be sufficient.

Comment 67

Hydraulic Reach Model. Each of the 16 delineated sub-watersheds was represented by a single, completely mixed one-dimensional computational segment. A representative stream reach was selected from the NHD database streams shown for each sub-watershed. Stream length and channel slope were computed from NHD and DEM data. Stream width and depth for each representative channel of a sub-watershed were estimated using regression curves relating upstream drainage area and stream geometry.

Information given in Appendix J (Section J.2.6) does not document the mathematics of the regression relationships used for the computation of drainage area dependent depth and width of a stream channel. Appendix J also does not document the citation or published source of the regression relationships or technical study. Since a trapezoidal cross-section is used to represent the stream channels, the side slopes of the bankfull channel and the floodplain must be assigned as model input. What are the numerical values and what is the basis of the assumptions used to assign side slopes for the waterbody representations? The City of Encinitas would specifically like to see the mathematical relationship used and the numerical estimates of stream width and depth used to represent the hydraulic properties of Cottonwood Creek in the San Marcos Basin (1101).

Response: Estimation of bankfull widths and depths were based on regional curves reported in *Applied Stream Morphology*[13], with coefficients developed specifically for southern California based on regression analyses of depth and width data collected from

[13] Rosgen, D. 1996. *Applied River Morphology*. Wildlife Hydrology, Pagosa Springs, CO.

53 USGS streamflow stations in the region. Results of this analysis were not included in the report due to the insignificance of assumptions on overall model simulations, and the unnecessary attention that would result in peer review of modeling assumptions. Channel dimensions do not impact flow or water quality computations, other than insignificant impacts on stream velocity that would only influence time of travel calculations within the stream in terms of minutes. At the daily time step used for hydrology calibration/validation, the minor impacts on timing of storm peaks were not noticeable. Furthermore, since model results used for TMDL analysis were based on daily loads, the effects of timing resulting from stream geometry assumptions were not considered critical.

Comment 68

Channel Geometry Data Sources. FEMA Flood Insurance Studies (FIS) have been performed for many urban areas of the nation over the past two decades. As a component of a FEMA study, hydraulic models, such as HEC-2 and HEC-RAS, are often constructed to delineate flood boundaries. Stream channel cross-section data that was used for input to the hydraulic models is often available from FEMA archives.

Was FEMA contacted as a potential source of stream geometry data for development of the watershed model to identify if such data would be available for the San Diego Region to supplement stream geometry estimates determined from the drainage area regression?

Response: FEMA Flood Insurance Studies are focused on flood events and therefore cross-sections used for model development are specific to the flood plain. However, these cross-sections often do not provide sufficient information at the much smaller scale required for assessment of typical flow conditions confined to the bankfull width and depth of the channel. Regardless, for reasons consistent with the response to Comment 69, investigation of methods for estimating stream geometry was focused on techniques for establishing regional assumptions due to the number of stream segments modeled**.**

Comment 69

Bacteria Loading Rates**.** Section J.2.5 and Table J-3 documents the Santa Monica Bay watershed model land use dependent bacteria accumulation rates used for determining bacteria loads from each watershed for the San Diego Regional model. The availability of such a data set is a valuable source of information for development of the San Diego Regional model. Table J-3 presents loading rates for 8 land uses. The San Diego Regional model accounts for 13 land uses.

Table J-3 should show the loading rates assigned to each of the 13 land uses defined for the San Diego Regional model. Table J-3, for example, defines a loading rate for 'agriculture' as the largest—by two orders of magnitude-- area based component of bacteria loading. In the San Diego Regional model, as shown in Table J-1, additional agricultural land uses are defined explicitly for 'dairy/intensive livestock' and 'horse ranches'. It is not likely that the bacteria loading rate from an agricultural field of crops, nursery operations or citrus tree groves, is the same as the bacteria loading rate from

'livestock' land uses. 'Agriculture' and 'Livestock' land uses of 0.06 (4.2%) and 0.25 (17.5%) square miles of the San Marcos (Cottonwood Creek) Basin, for example, are admittedly small, but not insignificant components of the total drainage area of the San Marcos Basin (1.43 square miles) sub-watershed (data from Table J-1).

Agricultural land uses in the San Marcos Basin in Encinitas have been transformed into urbanized land uses in the past several years. Since the loading rate for 'Agriculture' land uses is the highest of all the urban and non-urban land uses listed in Table J-1, it is critical that the assumptions used to characterize the bacterial loading rates for the actual 'Agricultural' and 'Livestock' land uses of the San Marcos basin accurately differentiate agricultural uses such as nursery operations from other agricultural related land uses. It is understood that loading rates for some of the land uses might be similar. Justification is needed, however, to support the assumption of similar loading characteristics for 5 of the land uses that are obviously lumped somehow into the 8 land uses shown in Table J-3.

Response: Specific modeling parameters associated with 'dairy/intensive livestock' and 'horse ranches' have not been developed for southern California due to lack of land-use-specific monitoring data to provide calibration. Therefore, their modeling parameters were based on 'agriculture' parameters listed in Table J-3. However, we recognize that these land uses likely represent different loading conditions, so they were included independently in the model although consistent with 'agriculture' modeling assumptions. As new data are collected that justify calibration of specific modeling parameters for these land uses, the model can be easily updated. We encourage all stakeholders to collect necessary monitoring data to improve assumptions for 'dairy/intensive livestock' and 'horse ranches' represented in the model.

Comment 70

Bacteria Loading Parameters. Table J-3 documents the land use dependent accumulation loading rates of bacteria. The watershed model also requires the specification of washoff rates and maximum accumulation rates.

The calibrated values assigned for each of these two additional parameters need to be documented for each of the 13 land uses assigned for the San Diego Regional watershed model. These three parameters, in particular, would be adjusted in the watershed model to simulate the effectiveness of BMP alternatives such as street sweeping.

Response: The maximum accumulation rate (SQOLIM) and the washoff rate (WSQOP) in the model were not adjusted for calibration purposes, but were instead held constant using consistent assumptions used by SCCWRP in their original calibration for Santa Monica Bay drainage areas, as reported in Appendix J. The maximum accumulation rates for each land use and indicator bacteria were assumed a concentration 1.8 times their respective build-up rates reported in Table J-3. The washoff rate, or the rate of surface runoff that removes 90% of the pollutant stored on the surface, was assumed 0.5 inches for all land uses and indicator bacteria. These assumptions, including sensitivity analysis, were reported fully in the Santa Monica Bay modeling reported referenced in Appendix J. We encourage a complete review of this preliminary work that formed the

basis of the modeling assumptions for this TMDL. Because these assumptions are consistent for each land use and indicator bacteria, they are not considered critical to Table J-3.

Comment 71

Bacterial Die-Off Kinetics. In addition to the land use dependent bacteria loading rates, an effective die-off rate of 0.8 per day was assigned to represent bacterial mortality, net settling and other losses in the wet weather model. Bacterial mortality is strongly dependent on water temperature.

It is not indicated in the report, or the technical appendices, if water temperature dependence of bacterial mortality is represented in the water quality model. A water temperature dependent bacteria die-off rate should be employed in the model framework for technical credibility. The die-off rate should be defined at a reference temperature of 20 C and a temperature coefficient value of 1.08 should be defined for bacterial die-off.

Response: Water temperature was not modeled in LSPC, so a temperature dependent assumption for bacteria die-off could not be simulated. Regardless, due to the velocity and overwhelming flows during wet weather and the dependence of die-off kinetics on time of travel (or time provide for die-off to occur), the impact of temperature dependent die-off rates are considered extremely small for wet weather flows.

Comment 72

Regional Scale Model-Data Comparison for Bacteria. The water quality model for bacteria was calibrated to data collected during 1991-1996 and validated to data collected during 1997-2001. A mix of dry, normal and wet flow conditions characterized the years used for calibration and validation. The definition of 'wet weather conditions' was used to split out wet weather data from the observed data sets and the model results for the critical year results generated for 1993. Figures N-1 through N-11 of Appendix N show the time series results for bacterial densities for the watersheds with observed data records.

The definition of wet conditions appears reasonable; it is a simple matter to adjust the definition to revise the TMDL calculations if a better definition is proposed and accepted.

The model-data comparisons for bacteria appear to be good although the log scale, which has to be used to show the bacterial density data, can be visually misleading. It would be beneficial to the readers to present regression plots of log scale modeled vs. log scale observed bacteria to show performance of the model where data is available for comparison. The availability of bacterial data is obviously limited but appears to be adequate to support model calibration for some watersheds. It would be helpful to clarify the availability of bacterial data for calibration and validation by presenting a table listing each sub-watershed to document the presence/absence of data from 1991-2001 for the calibration and validation years. Separate tables should be presented for Fecal Coliforms, Total Coliforms and Enterococcus. Inventory tables should also be compiled to document the availability of data for wet weather conditions and dry weather

conditions. It is noted that bacteria data does not seem to be available for model calibration for 1993. This was the year that was selected as the critical year for wet weather conditions computation of the existing loads and maximum allowable loads.

Response: Presentation of comparisons of model results with observed data presently includes 24 figures (15 pages) representing different locations and time periods. These results were specifically designed to provide the reviewer a detailed view of varying locations and timing. Sufficient opportunity was provided to the Stakeholder Advisory Group (SAG) and public to offer suggestions for presentation of model comparisons, but this comment was not received until well after model development and documentation was complete. We had already addressed comments by the SAG to provide further documentation addressing how monitoring data were used in model development, which are reflected in previous changes to the draft TMDL and modeling report.

It is important to note that no calibration was performed for bacteria modeling parameters. The present study provided validation of modeling parameters previously calibrated for the Los Angeles Region. Insufficient data were determined available to provide meaningful calibration of land use parameters for the San Diego Region. For this reason, a detailed presentation of model comparisons with observed data was determined unnecessary. Once sufficient land use monitoring data is collected in the San Diego Region, detailed results of model calibration and validation can be performed and more-detailed assessment of model accuracy can be provided, including additional presentation of comparisons of model results and observed data using a number of graphical and statistical techniques.

It is not necessary to show validation of the model for all years simulated, including the critical year used for TMDL calculation. Model calibration and validation is a separate process specific to the period data is available. Once validated, the model can be used to simulate all other years for which data is not available. This is one of the primary purposes for a model – to develop the model based on periods that data is available and subsequently use the model to predict conditions where/when data is unavailable.

Comment 73

Regional Scale Bacteria Model-Data Results in Appendix N. Figures N-12 through N-24 of Appendix N show the model-data results grouped by watershed basins and sorted by flow ranges.

The text in Appendix J on page J-12 states that the unit area flow is inches/acre. The plots shown in Appendix N, however, show the units as in/day. The units, whatever they are, need to be correct, and in agreement, in both appendices. The legend in these figures indicates observed average and modeled average of the bacteria data. The documents do not indicate if the average values are based on arithmetic or geometric calculations. Averages of bacteria data, since both the observations and model results span several orders of magnitude, should be based on geometric averages rather than arithmetic averages. \

Response: The rate (1/day) was not indicated on page J-12. The unit area flow was changed to inches/acre-day on page J-12. All averages reported in Figures N-12 through N-24 were calculated as geometric means.

Comment 74

Model Performance Statistics for Bacteria Results. Model performance statistics as relative errors are presented in Appendix M for the hydrologic model calibration and validation results for streamflow.

Comparable model performance statistics are not presented for the bacteria model results since the limited data sets that were available did not warrant the calculation of relative errors as is typically done for other watershed modeling studies.

It is unfortunate that sufficient bacteria data records are not available to allow the calculation of model performance statistics for the bacteria model. In the absence of an observed data base that can be used to evaluate statistics of the performance of the model, calibration and validation of the bacteria model, instead, relies solely on a visual comparison of the time series plots of model vs. data for the sub-watershed that have water quality monitoring data. Since there is no presentation of an uncertainty analysis of the watershed model results to indicate how the results might change with different sets of input parameters, it is difficult to infer the credibility of the watershed model framework as a tool for wet weather TMDL determinations.

Response: It is important to note that no calibration was performed for bacteria modeling parameters. The present study provided validation of modeling parameters previously calibrated for the Los Angeles Region. The reviewer should review additional model calibration results reported by SCCWRP for Santa Monica Bay drainage areas, included as an appendix to the bacteria TMDL for Santa Monica Bay beaches.

If sufficient data were available for calibration of bacteria modeling parameters, it is important to note that presentation of statistical evaluation of mode uncertainty is not a requirement to justify the model's use for TMDL calculations.

Comment 75

San Marcos Basin Local Scale Model-Data Comparison for Bacteria. *For the City of Encinitas, it is a concern that wet weather bacterial data was not available in Cottonwood Creek to provide convincing evidence that the bacteria loading rate assumptions taken from Table J-3, particularly the 53% of the total estimated load contributed by 'Agriculture' and 'Livestock', would in fact, result in good agreement to actual in-stream bacterial counts. If the assumptions regarding the land use dependent loads for the San Marcos Basin are inappropriate, then the model results would not provide good agreement to observed bacterial counts in Cottonwood Creek at the confluence with the Pacific Ocean at Moonlight State Beach. In the absence of bacterial data collected in the lower reaches of Cottonwood Creek that can be compared to watershed model results, the City of Encinitas does not have any convincing model-data results that can be used to support the investment that will be needed for implementation*

of the final TMDL determinations (i.e. 92-99% removal documented in Appendix P) and the construction of BMPs designed to reduce bacterial loading in our small watershed. It is recommended that wet weather and dry weather bacteria data be collected in conjunction with stream flow measurements in Cottonwood Creek near the confluence with the Pacific Ocean. This new data can be used for future watershed model-data comparisons for the San Marcos basin (1101).

Response: It is not necessary to calibrate the model in all watersheds to prove that modeling parameters are valid regionally or for each land use. We agree that additional bacteria data should be collected in all watersheds addressed by this TMDL to verify model performance. We encourage the City to collect bacteria data from various land uses to provide update of modeling parameters and possible refinement of the TMDL. We also encourage the City to collect data from Cottonwood Creek to provide comparison to model predictions, and provide assurance of model performance to justify implementation of BMPs.

Comment 76

Selection of 1993 as Critical Wet Year and Calculation of Existing and Allowable Maximum Loads. *While the methodology is appropriate for calculating existing and estimated maximum allowable loads, the limited amount of bacterial data prevents robust model calibration/validation. This raises questions regarding the validity of the loading estimates simulated for the critical year of 1993.*

Response: Please see the response to Comment 74.

Comment 77

Selection of Downstream Confluence with Pacific Ocean as Critical Location for Determination of TMDL. *The use of the most downstream location in each sub-watershed as the critical location for extraction of model results to compute existing and allowable bacteria loads is appropriate for the analysis to provide protection to the nearshore ocean beach sites.*

Response: Comment noted.

Comment 78

Dry Weather Model Approach and Source Term Methodology. Appendix K provides the rationale for development of a separate steady state model framework for determination of a dry weather TMDL for bacteria loading. The report states that: "The variable nature of bacteria sources during dry weather required an approach that relied on detailed analyses of flow and water quality monitoring data to identify and characterize sources. This TMDL used data collected from dry weather samples to develop empirical equations that represent water quantity and water quality associated with dry weather runoff from various land uses. For each monitoring station, a watershed was delineated and the land use was related to flow and bacteria concentrations. A statistical relationship was established between areas of land use and flow and bacteria concentrations".

Streamflow data, not available for many sub-watersheds, was estimated using a step-wise regression technique to empirically assign stream flow as a function of the land uses contributing to flow measurements recorded at streamflow gages in the study area. In-stream bacteria data sets available from water quality monitoring stations was used to infer a relationship between land uses contributing dry weather loading to a stream and the geometric mean of observed *in situ* bacteria counts. Multiple step-wise regression techniques were used to define Fecal Coliform Bacteria concentrations as an empirical function of contributing land uses. Total Coliforms and Enterococcus densities were estimated as a function of Fecal Coliform Bacteria estimates.

It is not clearly stated in the documentation of the methodology in Appendix K how the empirically derived bacteria concentration estimates were then used as input to the steady state model. Presumably, land use dependent flow estimates were multiplied by land use dependent bacteria concentrations to derive land use dependent loading rates. The loading rates were then assigned as either (a) upstream boundary condition for headwater stream reaches or (b) lateral tributary inflows for stream reaches downstream of headwater reaches. Mass balance calculations were then performed at the upstream end of a reach to compute the initial concentration at the upstream end of the reach. The concentration at the downstream end of the reach was then calculated as a function of the calibrated die-off coefficient and travel time within the reach. The model was calibrated by adjusting the in-stream die-off rate to match observed bacteria data and adjusting infiltration rates to improve the match to observed flow data. The model was then validated using data sets extracted from watersheds that were not used to determine the empirically defined regression relationships.

As shown in the figures presented in Appendix K, the spatial distribution of observed flow and bacteria counts are reproduced fairly well in the sub-watershed reach segments. It is not particularly noteworthy, however, that the dry weather model results provide a good match to the observed dry weather flow and bacteria data. This is to be expected since the observed flow and bacteria data was used to derive the land use dependent source loading terms assigned as input to the model.

Although we agree that the use of a steady-state model is appropriate for an analysis of dry weather flow and bacteria distributions to determine the dry weather assimilative capacity of the streams for bacteria, the dry weather source term methodology developed for the San Diego Region TMDL study has some flaws. Consequently, the approach and the results are lacking. The methodology, as documented in Appendix K, essentially seems to include what might be considered circular reasoning to compute the in-stream bacteria concentrations. In-stream flows and bacteria measurements are averaged, compiled for several sub-watersheds and empirically related with a multiple regression technique to contributing land uses and watershed area. Upstream boundary conditions for headwaters and tributary inflows are then computed from the composite empirical relationships for flow and bacteria and assigned as flow and bacteria source loading terms for each reach based on land uses and catchment areas contributing to a reach.

Response: The reviewer summarized the linkages and configuration of the dry-weather mode accurately, indicating that the documentation was sufficient for explaining the methodology. However, the reviewer is incorrect in stating that data used for regression

analysis and development of loading estimates were also used for model calibration. Data used for regression analysis and development of equations to predict watershed runoff flows and water quality were independent of datasets used to calibrate instream infiltration and bacteria die-off.

It is true that some data from monitoring stations used in the regression equations were also used in calibration of instream infiltration and bacteria die-off. However, a detailed discussion is provided on page K-12 that addresses this issue and explains how circular reasoning is not considered an issue.

Comment 79

Equations used for Dry Weather Model. Appendix K presents the analytical solution that was coded as the steady state, one-dimensional stream model as a series of plug flow reactors. Each stream reach segment (reactor) is assigned a constant source of flow and bacteria at the upstream end of the computational segment. Flow and bacteria concentrations assigned as model input data were empirically estimated from the regression relationships discussed in Comment 78.

In addition to the questionable methodology used to derive the source loading terms for the dry weather model, we do not believe that the analytical model itself correctly represents the water quality response within a reach to a uniformly distributed nonpoint source input of flow and bacteria. The analytical model, as presented in Appendix K, is appropriate for the representation of a point source discharge at the upstream end of a reach and the subsequent exponential decay (die-off) based on travel time along the length of the reach. The model, as structured, assigns the distributed flow and bacteria load that accumulates over the length of a reach as a "point source" discharge at the upstream end of the reach.

Thomann and Mueller (1987) (page 61-69) present the analytical solution for a steady state stream model that includes the water quality response to point source discharges at the upstream boundary end of a reach and distributed nonpoint source inputs contributed along the entire length of a reach. The differential equation for a mass balance at steady state with constant flow (Q) in a reach is given as:

$$U\frac{dS}{dx} + K.S = \frac{w}{A}$$

where: w is the uniformly distributed source with units of mass/length-time and A is the cross-sectional area of the reach. The solution of the model is given as:

$$S(x) = S_o \exp(-K\frac{x}{u}) + (\frac{w}{A.K})[1 - \exp(-K\frac{x}{u})]$$

where: S_o is the completely mixed concentration determined from the mass balance computation based on of the upstream boundary and the lateral inflow at the upstream end of a reach; K is the die-off rate (day^{-1}); x is distance along the length of the reach where x = 0 is the upstream end of the reach and x=L at the downstream end of a reach of length L; u is the velocity in the reach $u = \frac{Q}{A}$ *; and S(x) is the concentration as a function of distance, x, along the reach.*

The approach used in the dry weather model defined in Appendix K essentially incorporates all the bacteria load into the S_o term of the solution as a point source at the upstream end of a reach rather than assigning a bacteria load that is parameterized as a line source. It appears that calculations have not been performed for this review to determine how much of a numerical difference would result from the use of the correct analytical model to represent nonpoint source loading of bacteria. Regardless of the numerical differences between the approach adopted for the dry weather model described in Appendix K and what we believe to be the more appropriate approach identified above, the technical credibility of the dry weather model is lacking without the use of the distributed nonpoint source term in the model framework.

Response: The commenter is correct that the distributed loading equation is likely more representative of actual conditions than the point source version used. However, it is important to note that the distributed loading equation, as defined by the commenter, does not incorporate the increased complexity due to decreasing flows resulting from infiltration and the resulting reduced assimilative capacity of loads along the stream length. Also, urban runoff loads are unlikely to be evenly distributed along a stream length, and as with wet flows, are likely to increase in magnitude as the watershed size and tributaries increase downstream. Moreover, as flows increase, so does the stream's cross-sectional area, wetted perimeter, and resulting ability of flows to infiltrate via a wider stream bottom. In most "gaining" streams, or streams that are supplied water by groundwater baseflow, the general distributed loading equation is most useful and can be based directly on the formulation outlined by the reviewer. However, in urban streams of arid environments such as southern California, where the majority of flow is provided by urban runoff and the streams are generally "losing" water due to infiltration, the true formulation of the distributed loading equation is much more detailed than the version outlined by the reviewer. Even more important, the distributed loading equation would require additional assumptions for distributing the load and losses through infiltration, without additional information to justify or define these assumptions. Therefore, the best equation was determined to be the simplest approach that provides representation of the most processes considered critical to TMDL calculation, with sufficient data to base assumptions. For this reason, the point source form of the equation was considered the most technically credible given the amount of data available to base assumptions and provide calibration/validation of key parameters.

Comment 80

Selection of Dry Weather Model Approach for TMDL Determination.

Over and above the questionable representation of the water quality response of nonpoint sources in the dry weather steady state model, the larger issue, however, is that it is not at all clear why a separate steady state modeling approach was even adopted for the dry weather TMDL evaluation. Appendix K notes that the large spatial variability of dry weather bacteria data necessitated the use of a "different approach" to define more detailed source functions. Based on the hydrologic model results given in Appendix M, the watershed runoff model seems to do a reasonable job of representing low flow conditions during the April-May through October months. The wet weather model-data results given in Appendix M clearly show a seasonal cycle of high and low flow conditions with low flow conditions occurring during April/May through October/November. Although model performance statistics are not presented, the hydrologic model appears to adequately represent streamflow during the seasonal low flow conditions. Although land use dependent bacteria loading rates (Table J-3) were calibrated for the wet weather TMDL analysis, the time variable results of the watershed runoff model were apparently not extracted either for generation of load duration curves or statistical analyses of the model vs. data response for days defined by dry weather conditions. The watershed runoff model presumably could have been used for the dry weather TMDL evaluation if a slightly different conceptual model was adopted to account for chronic, dry weather constant loading of bacteria in addition to the wet weather storm event driven loading of bacteria where both dry and wet weather loads are dependent on land uses.

Using a modified conceptual model, calibration of the bacteria model would have first focused on dry weather measurements of flow and in-stream bacteria to calibrate a set of land use dependent "export coefficients" to represent constant bacteria loading from the sub-watersheds. Export coefficients would be adjusted for the different land uses until the weighted mix of loading rates resulted in a good match to observed dry weather bacteria data. The calibrated dry weather model results would then be used to derive load duration curves for each sub-watershed using the identical approach adopted for the wet weather analysis. Existing dry weather load duration curves would be compared to maximum allowable load duration plots based on dry weather numeric target criteria for bacteria and model flow data. The total load reductions for dry weather conditions would then be computed as the difference between the existing dry weather load and the maximum allowable TMDL.

Following calibration of the bacteria model to dry weather conditions, the model would be calibrated to wet weather conditions. The dry weather export coefficients used to define chronic constant loading would be imposed as a component of the wet weather evaluation since by definition, dry weather loading is essentially constant over time. Presumably, wet weather in-stream bacteria measurements reflect both the dominant

storm-driven loading as well as the chronic constant loading that is present during dry weather conditions.

The technical credibility of the dry weather TMDL evaluation would be greatly enhanced if the LSPC watershed runoff model was applied within an internally consistent model framework for both dry weather and wet weather conditions.

Response: LSPC is insufficient for modeling dry-weather flows and bacteria loads for a number of reasons. Although LSPC calibration results show a good comparison to dry seasonal volumes, it is important to note that "seasonal" includes any rainfall event that occurred during this period. As a result, these seasonal volumes are not confined to dry-weather flows. It is important to note that flows simulated by LSPC are only produced by rainfall-runoff processes. The model does not include capability for estimation of dry urban runoff resulting from anthropogenic sources unrelated to natural hydrology (e.g., car washing, lawn irrigation runoff). Since the model does not include runoff volume from dry urban runoff, it is impossible to assign an associated load of bacteria. LSPC also does not provide sufficient resolution for simulation of instream infiltration that is a major factor for dry flows.

The approach recommended by the reviewer for estimation of dry flows and instream bacteria loads using "export coefficients" is flawed due to the inability of LSPC to predict dry urban runoff. Essentially, there is no flow predicted by LSPC to calibrate to dry weather measurements. It is unclear how the reviewer would intend to use "export coefficients" to represent constant bacteria loading from the subwatersheds. Such 'constant' loads are steady-state and do not provide variability of loading estimates during dry weather. If the dry loads do not vary, then it is impossible to produce dry weather load duration curves (dependent on a range of small to large flows) recommended by the reviewer. If the dry flows and loads are constant and steady-state, then it is unclear how this approach provides any advantage over the approach used in the TMDL.

Comment 81

The proposed TMDL affects approximately 356,733 acres of land within the City of San Diego, runoff from which enters receiving waters via approximately 4,660 storm drain outfalls. The proposed TMDL allows for zero discharge of human-generated indicator bacteria from these outfalls (i.e., before the storm water reaches receiving waters) regardless of weather conditions.

Response: Final wet weather allocations for controllable sources are zero. We are aware that identifying specific sources of bacteria, and differentiating between human generated and non-human generated, is difficult and costly. The TMDL relies on WQOs for indicator bacteria, meaning that receiving waters should not have bacteria densities in excess of WQOs. As long as WQOs are met, the source of the bacteria is not necessarily a determining factor for TMDL compliance.

The purpose of established WQOs is to ensure conditions that are safe for recreational swimming and shellfish harvesting. We recognize that there may be shortcomings with using indicator bacteria to measure water quality instead of pathogens directly. For

example, if bacteria re-grow in the environment, this does not necessarily correlate to an increase in public health risk. For that reason, we encourage the elimination of human-generated sources of bacteria, and the verification of these accomplishments wherever possible. Please see the response to Comment 2.

Comment 82

Significant concerns with the project are as follows:

- Recent data provided to the Regional Board at its February, 2006 workshop on this project suggest that indicator bacteria are not indicative of public health threats at southern California beaches. Indicator bacteria standards in the Basin Plan were established in the 1970s based on older and inapplicable epidemiological studies.
- Recent studies conducted by the City of San Diego have concluded that bacterial contamination at beaches is largely due to kelp, birds, and flies on beaches.
- The Basin Plan standard for bacteria in relation the beneficial use "SHELL" was established in the 1970s to protect human health from consumption of shellfish. However, the State Department of Health Services, which actually has regulatory control over bacteria levels in commercial shellfish, uses a less conservative standard than that in the proposed TMDL.
- The Basin Plan erroneously applied SHELL to the mouth of Chollas Creek since the mouth of Chollas Creek has been dredged and surrounded by commercial uses since the 1920s.
- The Basin Plan erroneously applied REC-1 as a potential beneficial use throughout the Chollas Creek watershed since significant portions of the creek were channelized for flood control purposes prior to adoption of the Basin Plan.
- The only known technologies that will eliminate bacteria in storm water are diversion (to eliminate the storm water via, for example, infiltration) and treatment with chemicals (such as chlorine and ozone) or ultraviolet light. The TMDL requires maintenance of existing hydrology in receiving waters; therefore, treatment of at least dry weather flows is required.
- Diversion and treatment will both result in the removal of sediment from storm water discharges. The impact of sediment removal on creeks and beaches should have been documented during TMDL development.
- Allowing zero bacteria in storm water discharges, coupled with bacterial re-growth in storm drains, means that diversions and treatment facilities must be located in areas as close as possible to storm drain outfalls. Most of these areas are privately owned and developed.
- The potential for widespread use of infiltration, which is based on soil types in the watersheds, is unknown but should have been documented during TMDL development.
- The environmental impacts associated with the massive public works that must be undertaken for compliance are not disclosed in the Regional Board's CEQA analysis.

- The financial impacts associated with the massive public works that must be undertaken for compliance are not disclosed in the Regional Board's technical report.
- Many water bodies affected by this TMDL are currently listed as impaired. The City must address all pending TMDLs when it complies with this TMDL; therefore, the City recommends that this TMDL be integrated with other TMDLs on a watershed by watershed basis.
- The 10-year implementation schedule sets up the City of San Diego for non-compliance, the financial penalties associated therewith, and lawsuits from other stakeholders.

Response: The numerous comments above are addressed separately below.

Indicator bacteria. As previously stated, we recognize that there may be shortcomings with using indicator bacteria to measure water quality instead of pathogens directly, and that the accuracy of the correlation of bacteria densities to health risks is the subject of recent discussions. For this reason, several studies have been completed or initiated to examine the health risks associated with indicator bacteria, as well as potentially new indicators of health risks.

We are obligated to proceed with utilizing WQOs consisting of total coliform, fecal coliform, and enterococci bacteria to calculate TMDLs because they are the established indicators of risk to public health. Under Clean Water Act (CWA) section 303(d), the San Diego Water Board is obligated to develop TMDLs for waters not meeting WQSs (WQOs and the beneficial uses they are designated to protect). TMDL calculations must be based on existing WQOs.

The administrative proceedings at the San Diego Water Board level are not the appropriate forum for investigating the validity of the bacteria WQOs. Reevaluation of water quality criteria that are the basis for WQOs cited in the Basin Plan takes place at the USEPA level. Should USEPA promulgate new water criteria, then the WQOs in the Basin Plan will be updated accordingly and TMDLs recalculated.

Kelp as source. We are aware that much of the bacterial contamination at beaches is largely due to kelp, birds, and flies on the beach. For that reason, interim wet weather TMDLs were calculated using the "reference system approach," which takes into account bacteria densities caused by such sources. The reference system approach allows a 22 percent exceedance frequency of the single sample WQOs for REC-1. TMDLs were calculated taking this exceedance frequency into account. Although the reference system approach only applies to interim TMDLs, a Basin Plan amendment has been initiated to permanently incorporate a reference system approach for the purpose of calculating TMDLs. After this takes place, final wet weather TMDLs will be recalculated to allow exceedances of single sample WQOs during wet weather due to natural background loads including bacteria from kelp, birds, and flies. The reference system approach was not used for dry weather for the reasons outlined in response to Comment 2.

Shellfish and REC-1 designations and WQOs. According to section 303(d) of the Clean Water Act, we are obligated to calculate TMDLs for all impaired waterbodies using the existing applicable WQOs. We realize that not all stakeholders agree that TMDLs should

be based on WQOs designed to be protective of shellfish harvesting, nor do all stakeholders think the beneficial use should be designated across all ocean waters of the Region. However, just as we are obligated to calculate TMDLs using indicator bacteria for REC-1 use, so are we obligated to calculate TMDLs for the SHELL beneficial use. Whether or not the use is appropriate at the mouth of Chollas Creek, or anywhere else, is a discussion that can only take place when evidence is produced demonstrating that the SHELL use was not occurring on or after November 28, 1975, and that water quality necessary to support SHELL use has not been attained in the water body since November 28, 1975. Although the City of San Diego has produced some evidence to support its contention, more definitive evidence is needed before the San Diego Water Board can change the SHELL use from "existing" to "potential" and conduct a use attainability analysis. To de-designate channelized portions of Chollas Creek for REC-1, the San Diego Water Board needs evidence that a use attainability analysis is appropriate.

Maintenance of existing hydrology. The commenter incorrectly states that the TMDLs require maintenance of existing hydrology in receiving waters. We agree that treatment of dry weather flows may be a suitable option for reducing bacteria. The environmental analysis (Appendix R) has been revised to clarify this issue.

Sediment removal on creeks and beaches. Appendix R has been revised to address this comment.

Location of treatment facilities. Although a concern, the siting of structural BMPs, whether in private or public land, is a project level issue the dischargers will have to address.

Widespread use of infiltration. Whether or not the use of infiltration is feasible in terms of complying with TMDL requirements is the responsibility of the dischargers to investigate. We cannot speculate on the manner of compliance with the TMDLs.

Environmental impacts of massive public works. Appendix R has been revised to include a more extensive discussion of the adverse environmental impacts and financial impacts associated with the reasonably foreseeable methods of compliance.

Integrated TMDLs. The City of San Diego put forth a specific 20 year compliance schedule for metals and bacteria TMDLs in Chollas Creek. We have incorporated a modified version of that schedule in these TMDLs, and added an option for extending the compliance schedule if dischargers propose addressing all water quality problems in a watershed in their pollutant load reduction plans. These revisions can be found in section 11.4.2 of the Technical Report.

Comment 83

The City of San Diego questions the rationale for not providing Caltrans, General Industrial Permittees, other Phase II Municipal Storm Water Permittees (MS4s) and non-point sources with a waste load allocation (WLA). It may appear that their contribution is minimal; however, with 100% reductions required, all sources need to reduce their loading. This concept is particularity important with those entities that hold an existing NPDES permits and/or Waste Discharge Requirements (WDRs). It is improper that the

Regional Board place the responsibility and liability to comply with this TMDL Phase I MS4s.

The City of San Diego again requests a time line regarding when the Regional Board will contact the Phase II MS4 permittees for inclusion into this TMDL Program. Currently, University of California, San Diego, San Diego State University, University of San Diego, the Community College District's facilities and the San Diego Unified School District's facilities have not been included in this process. These Phase II MS4s and others are contribute loading to the listed impaired waterbodies and should be notified of their requirement to participate by the Regional Board. The City believes that, since bacteria reproduce in storm drains, all storm drains, including Caltrans', have a substantial potential for introducing bacteria into receiving waters. In addition, the City has documented issues with the discharge of food waste from outdoor eating areas at schools. These discharges also constitute potentially substantial contributions of bacteria that should be considered in the TMDL.

Response: As indicated in the final wet weather TMDL tables in section 9 of the Technical Report, Caltrans, municipal dischargers, and controllable nonpoint source dischargers all receive a WLA or LA of zero, or 100 percent reduction. Table 11-2 describes the responsible municipalities in each jurisdiction, which includes small MS4s in each watershed. We recognize that it will be difficult for dischargers to meet final allocations and WQOs during wet weather. Therefore, we are developing a Basin Plan amendment to permanently incorporate a reference system/natural sources exclusion approach for implementing bacteria WQOs as described in the response to Comment 2.

We have contacted by phone the small MS4s listed in Appendix Q to make them aware of these TMDLs. Steps to regulate small MS4s will begin after we have initiated steps to regulate Phase I municipal dischargers in accordance with the discussion in section 11.5.3 of the Technical Report.

Comment 84

In good faith members of the Stakeholders Advisory Group participated in the Reference Beach Bacteria Study at San Mateo and San Onofre Creeks. The purpose of the study was to help Southern California Coastal Waters Research Project (SCCWRP) gather data from beaches that have minimal human development. This data was to be used to develop a baseline for natural bacteria background concentrations. Many SAG members volunteered staff time and resources. The City of San Diego volunteered many man hours to collect some samples and processed all the samples. How was this data used in the development of the TMDL?

Response: The effort to which the commenter refers is being used to develop the reference system approach/natural sources exclusion Basin Plan amendment. The data retrieved in this effort is not being used for development of the current TMDLs. However, these TMDLs will be recalculated once the Basin Plan amendment authorizing the reference system/natural sources exclusion approach has been adopted.

Comment 85

The City of San Diego understands that Margin of Safety (MOS) is a required component for the development of TMDLs. This TMDL uses an implicit MOS that applies conservative assumptions throughout the development of the TMDL. However, the application of this conservative MOS is on top of the MOS the US Environmental Protection Agency (EPA) applied when they developed the REC1 standards. The City of San Diego questions the application of the implicit MOS with its conservation assumptions when another MOS Watershed already has been applied to this TMDL indirectly. The City of San Diego believes the use of an explicit MOS is more appropriate for this TMDL.

Response: Please see the response to Comment 36.

Comment 86

The label on "Table 9-3: Interim/Final Dry Weather TMDLs for Fecal Coliform as a Monthly Load" shows that both the interim and final loads are the same; therefore, a decision needs to be made as to whether this monthly load requirement is for interim or final compliance.

Response: Final TMDLs are based on WQOs for SHELL, and therefore are only meaningful for total coliform. Therefore for fecal coliform and enterococci, final TMDLs are the same as interim TMDLs. We deleted the term "interim" from the title.

Comment 87

Table 9-5 Interim Wet Weather TMDLs for Total Coliform Expressed as an Annual Load's percentage of reduction appears to be in conflict with Table 11-4: Compliance Schedule and Interim Goals for Achieving waste load reductions.

Response: The comment is unclear as to how the information in Table 9-5 is in conflict with Table 11-4. We assume the conflict involves the zero WLA for controllable sources. Please see the response to Comment 2.

Comment 88

Table 9-8: Interim Wet Weather TMDLs for Enterococcus Expressed as an Annual Load's percentage of reduction appears to be in conflict with Table 11-4: Compliance Schedule and Interim Goals for Achieving Waste Load Reductions.

Response: The comment is unclear as to how the information in Table 9-8 is in conflict with Table 11-4. We assume the conflict involves the zero WLA for controllable sources. Please see the response to Comment 2.

Comment 89

The label on Table 9-10: Interim/Final Dry Weather TMDLs for Enterococcus as a Monthly Load shows that both the interim and final loads are the same; therefore, a

decision needs to be made as to whether this monthly load requirement is for interim or final compliance

Response: Please see the response to Comment 86.

Comment 90

Section 9 Total Maximum Daily Loads and Allocations: Greater wet weather loading reductions for all indicators should be required from identified agriculture/livestock dischargers due to the fact that these relatively small facilities lend themselves to the opportunity for water quality control. As calculated in Table 9-1, the load allocation assigned to agriculture/livestock in the San Juan Creek watershed is 2,856,458 billion MPN/year. This is more than twice the 1,155,725 billion MPN/year waste load allocation assigned to the MS4 dischargers. Yet both allocations are assigned the same percent reduction. The loadings from the agricultural areas come from a small defined land area and most likely, easily identifiable sources (manure stockpiles, fertilizers, etc.). In contrast, the loading from the MS4 system comes from diffuse and unknown sources spread over the entire watershed area. Greater loading reductions should be more easily achievable from the agricultural/livestock land areas.

Response: The commenter is correct in saying that the percent reduction for the agriculture/livestock dischargers is the same as the percent reduction required for MS4 dischargers. The methodology used to develop allocations in the San Juan Creek, San Luis Rey River, San Marcos Creek, and San Dieguito River watersheds was designed to produce proportional load reductions among the two main discharger categories. In formulating this methodology, we attempted to use a fair approach to developing load allocations and reductions. Setting allocations *proportional* to existing loading was the way we chose to accomplish this.

We agree that agricultural and livestock practices lend themselves to the opportunity for water quality control. Agricultural and livestock dischargers may be able to meet their allocations easier or faster than MS4 dischargers, or achieve that load reductions in excess of 13 percent. This could create an opportunity for trading pollution credit. Municipal dischargers could meet their reductions by paying for BMPs to achieve higher load reductions from agricultural and livestock facilities.

Comment 91

The interim wet weather numeric target for the indicator bacteria incorporates the reference beach concept to allow for natural sources of the indicator bacteria. While we do endorse this method there may be potential public perception issues that could arise when a wet weather monitoring report for a given beach indicates that the samples exceed the numeric targets but are below the 22% exceedence frequency limit. A beach warning would be posted. The first issue would require public outreach to explain the intent of the 22% exceedence frequency allowance should this matter arise. The exceedence should in no way detract from the required beach warning and closure per AB 411. The second issue follows and this deals with the health risk associated with the natural sources of the fecal indicator bacteria. Section 11.6.2 discusses this matter and we

strongly support that studies should be conducted to determine the health risks to humans from the potential pathogens from animal sources. We also support research to provide rapid response indicators of pathogens as in Section 11.6.3.

Response: The allowable exceedance frequency to account for natural sources of bacteria will not affect the beach warnings and closure protocol described in this comment. The protocol is outlined in Health and Safety Code 15880 (commonly referred to as "AB 411") and is independent of these TMDLs.

Comment 92

The term "bacteria" is generally used in the report to mean indicator bacteria. However, we recommend revisions to Investigate Landfills as a Potential Bacteria Source on page 134, section 11.5.6 Additional Actions, in order to clarify the distinction between the potential pathogens in the landfills, indicator bacteria, and the bacteria that are associated with the generation of methane during the decomposition of organic matter. We recommend that in the topic heading and the first sentence replace "Bacteria" with "Pathogens". The second paragraph incorrectly infers the presence of indicator bacteria because evidence of methane gas. Different types of bacteria are involved methane gas formation. See for example, the cited references on methane gas formation. Therefore, we recommend that this paragraph be deleted because generation of methane gas is not germane to investigating the presence of indicator bacteria and pathogens in the landfills.

We disagree with the third sentence in the third paragraph that states that landfills are an "unlikely source of bacteria with respect to these TMDLs". Presumably, these are the fecal indicator bacteria. If this is correct, then does this mean that the sewage sludge that are allowed in landfills do not contain fecal bacteria? Furthermore, opportunistic mammals visit landfills and it is reasonable to assume that they deposit feces. Other sources include discarded residential pet wastes and soiled diapers. The last sentence of this paragraph should be deleted for clarity as these are the methane forming bacteria explained above.

In the fourth paragraph we recommend that "bacteria" in the first sentence be replaced by "indicator bacteria".

Other pathogens not related to indicator bacteria could potentially be in solid wastes that are discarded in the landfills and enter into the waters of the state. We concur with the recommended investigations to determine if landfills are a potential source of indicator bacteria discharges into surface waters on page 135. We further would recommend that these investigations include pathogens not related to the indicator bacteria.

Response: We have modified the Technical Report for clarity in response to this comment. Please see section 11.

Comment 93

Table 11-3, the Prioritized list of Impaired Waters for TML Implementation, was developed by the SAG in consultation with RWQCB staff, and has appeared in prior versions of the Draft Technical report. However, in the current draft the RWQCB staff

unilaterally changed the Priority designation of San Juan Creek from 3 to 1, and added San Juan Creek mouth as a Priority 1 location, contrary to the input from the SAG. The Priority designation of San Juan Creek and the beach at its mouth should be returned to the previously concurred Priority 1. These waterbodies should be the same priority as they will have to be managed together. As we learn more about the dynamics and interrelationship of the creek mouth and beach water quality, it would be futile to treat them independently.

Response: Previously, the San Juan creek mouth was not included in this project because it was to be included in the TMDLs for bays and lagoons, a separate effort from the beaches and creeks TMDLs. The creek mouth was later included in the beaches and creeks TMDLs because the characteristics of the mouth were better suited for the beaches and creeks TMDLs than it was for the lagoons TMDLs (the computer modeling in both TMDL projects were different). Because the mouth of the creek discharges to a heavily populated beach, we gave the creek mouth a 1 priority. Since, achieving WQOs at the mouth/beach is dependent on the water quality of the creek; we changed the priority for the creek from 3 to 1. This decision was made in consultation with SAG member Amanda Carr from the County of Orange.

Comment 94

Section 11.6.1 indicates that "data from each watershed can be collected and used to calibrate and verify the models for that watershed instead of relying on the regional calibration used in this project." It seems likely that the refined modeling could result in different estimates of Existing Load than currently shown in the Tables in Section 9; and that the Wasteload Allocations and Percent Reductions would therefore also be different. The text should identify who will be doing this model refining work and what procedural requirements there will be to incorporate the findings of the refined models as updated TMDL targets and updated Bacteria Load Reduction Plans.

Response: The Technical Report has been updated to clarify that either the San Diego Water Board or a stakeholder, through a Memorandum of Understanding, could update the watershed models used for TMDL development. TMDLs would need to be updated through the Basin Planning process. We recommend stakeholders review USEPA's guidance for third-party led TMDLs for procedural requirements.

Comment 95

On page B-7, Allocations and Reductions: "……..Although considered a controllable source, load reductions from the California Department of Transportation (Caltrans) are not necessary because in all watersheds, loads from Caltrans are a minor contributor to the total existing loads." The City requests documentation to support this statement, please. The City did not see any Caltrans data sources in Appendix G that may help support this statement.

Response: The methodology for allocating TMDLs amongst dischargers is described in Appendix I. The assertion that Caltrans is a minor contributor of bacteria is supported by the relatively low bacteria loads originating from the industrial/transportation land use

(see Tables I-12 through I-14). Furthermore, Caltrans occupies only a fraction of the industrial/transportation land use area (see Table I-2).

Comment 96

During dry weather, application of the loading-based approach effectively puts in place water quality standards that are more stringent than those in the Basin Plan. (The loading based approach requires the arithmetic average concentration to be equal to the geometric mean value specified in the Basin Plan. Because fecal indicator data are known to be lognormally distributed, the average is always greater than the geometric mean, thus this approach puts in place more stringent requirements).

Response: Dry-weather loads were not predicted based on the arithmetic average bacteria densities, but were based on the regression analyses of the geometric mean of bacteria densities observed in multiple streams throughout the San Diego Region, as discussed on page K-7 of Appendix K.

Comment 97

We urge the Board to thoroughly review the comments summarized above and consider revising the TMDL to address our comments. In this regard, an appropriate starting point would include a thorough evaluation of the appropriateness of the TMDL's loading-based approach, a reconsideration and thorough explanation for the use of SHELL WQOs for total coliform as the appropriate numeric target for creeks and rivers even though they do not support the SHELL use, and much more thorough evaluation of the potential public health and environmental benefits and likely costs associated with implementation of the TMDL.

Response: We have thoroughly reviewed all comments received and made modifications to the Technical Report as appropriate. We have discussed these issues at length with the Stakeholder Advisory Group (SAG) since its inception in 2003. Some changes to the Technical Report have been made as a result of suggestions from the SAG, and some suggestions resulted in no changes because they were in conflict with the underlying goal of these TMDLs.

The rationale behind the loading based approach is described in the response to Comment 147. The explanation of the SHELL WQOs as the numeric target for total coliform TMDLs can be found in section 4.3 of this appendix. A discussion of the potential health and environmental benefits that are compromised because of poor water quality is described in the response to Comment 3. Likely costs associated with structural and nonstructural BMPs to achieve bacteria load reductions are discussed in Appendix R.

Comment 98

Inconsistency between Department WLAs and current Department loads – We appreciate that the Regional Board acknowledges that Department's discharges constitute a small fraction of the total bacteria indicator load for this TMDL. We understand that it is the

Regional Board's intent to maintain the Department's current pathogen indicator load as the Department's final waste load allocation (WLA). However, we are concerned that, as presented, the WLAs might be open to interpretation. The Department would like to be assured that the WLAs accurately reflect the Department's load. If subsequent bacteria issues arise within these subject watersheds, such as uncharacteristically high levels of bacteria from Department facilities, the Department will address them on a case-by-case basis.

The inconsistency between the loads calculated for the different watersheds covered by the TMDL is one reason for our concern. For example, the WLA assigned to the Department at the Miramar watershed is very small compared to other similar sized watersheds throughout the TMDL (please refer to Table I-15), as illustrated by the following cases:

- The WLA assigned to Industrial/Transport runoff (including the Department) in the San Dieguito River watershed is 4.2 trillion MPN/year, whereas that assigned to Miramar is 1 billion MPN/year. The area used for Industrial/Transport in Miramar is about 50% larger than that within the San Dieguito watershed. The staff report should explain this inconsistency or the WLAs should be adjusted.
- The WLA assigned to the Department in the Dana Point watershed is 0 MPN per year. The Department has a drainage area less than 40 acres in this watershed and, as a result, a pathogen indicator load will most likely be discharged from the Department roadways. Even though the load is expected to be relatively small, it should be accounted for in the staff report.

Response: The discrepancy between the two WLAs in this example is due to the difference in size, and bacteria loads, washing off of the two watersheds. The San Dieguito River watershed is roughly 346 square miles, and the Miramar watershed is roughly 93 square miles (Table J-1). This translates into a sizeable difference between the bacteria loads washing off the watersheds. The total existing fecal coliform load washing off the San Dieguito River watershed is 21,286,909 billion MPN/year, and the total existing fecal coliform load washing off the Miramar watershed is 10,392 billion MPN/year (Table I-12). Therefore, because these two watersheds vary greatly with size and bacteria generation, the estimated loads generated by the industrial/transportation land uses likewise varies.

The industrial/transportation land use is responsible for about .02 percent of the total existing load in the San Dieguito watershed, or about 4,257 billion MPN/year. The industrial/transportation land use is responsible for about .01 percent of the total existing load in the Miramar watershed, or about 1 billion MPN/year (Table I-12).

Once the loads generated by the industrial/transportation land use are quantified, then a portion of that total load was attributed to Caltrans, and the rest was attributed to municipal dischargers. For example, in San Dieguito, 35 percent of the industrial/land use area is attributed to Caltrans, therefore Caltrans generates about 1,496 billion MPN/year (Table I-15). The WLA for Caltrans is the same as the total existing load generated by Caltrans, so the WLA for Caltrans in this watershed in 1,496 billion MPN/year. In the Miramar watershed, the full allocation is given to municipal

dischargers. This is because the total existing fecal coliform load, 1 billion MPN/year, is small compared to loads in the remaining watersheds. We did not divide the WLA smaller than 1 billion MPN/year.

Table I-15 describes the existing fecal coliform loads generated by the industrial/transportation land use and Caltrans. To the order of magnitude used in our analysis, 1 billion MPN/year, we found that there is no significant discharge of fecal coliform originating from these sources relative to other land uses in the Dana Point watershed. Therefore Caltrans is allotted a zero WLA of fecal coliform, the same as their existing load.

Comment 99

Final and interim WLAs – We are concerned with data presented in Tables 9-2, 9-5, and 9-9. The tables list the Department's final wet weather WLAs for fecal coliform, total coliform, and enterococci as 0 MPN per year. The wet weather WLAs for the Department are identified to be set equal to existing loads "since discharges from Caltrans were found to account for less than 1 percent of the total wet weather load in all watersheds". In contrast, Tables 9-1, 9-4, and 9-8 contain the interim WLAs for the Department that have been set to existing WLAs. Since the Department will be responsible for maintaining existing loads, the final loads should be the same as the interim loads.

Response: As indicated in the final wet weather TMDL tables in section 9 of the Technical Report, Caltrans, municipal dischargers, and controllable nonpoint source dischargers all receive a WLA or LA of zero, or 100 percent reduction. We recognize that it will be difficult for dischargers to meet final allocations and WQOs during wet weather. Therefore, we are developing a Basin Plan amendment to permanently incorporate a reference system/natural sources exclusion approach for implementing bacteria WQOs as described in the response to Comment 2.

Comment 100

Simple loading of bacteria, whether by monitoring data or modeling simulations, does not completely address whether "downstream" shellfish beds in nearby embayments (e.g., San Diego Bay) or the coastal shorelines of the Pacific Ocean may be impacted. It would be more complete and realistic to combine the loading scenario with a waterbody dispersion (hydrodynamic) model or in-situ monitoring – to determine whether the bacterial populations remain viable and harmful after mixing in the receiving system.

Response: At the time of TMDL development, we explored the use of such dispersion models but found that estimating external loading from shoreline processes was difficult due to limited data. We chose a watershed based approach because this provided effective information regarding bacteria loading into receiving waters from both controllable and uncontrollable sources in the watersheds. We can consider using dispersion models in future TMDL refinement if more data is collected regarding shoreline sources such as marine mammals, birds, and sediment resuspension.

Comment 101

Page 3, Section 1.1, Why was a reference system from Los Angeles County used vice a reference system from the San Diego watershed? What are the details of the LA county reference system (beach and upstream watershed) that matched the San Diego watershed?

Response: The Arroyo Sequit watershed in Los Angeles County was used for TMDL development in the San Diego Region because, at the time that this project began, this was the only suitable reference watershed in southern California for which data were available. The criteria for a watershed to be considered for use as a "reference" watershed, for both the Los Angeles and San Diego regions, are that the watersheds consist of primarily open space (> 95 percent).

SCCWRP has characterized three other reference beaches, and is characterizing several reference watersheds. Upon adoption of the reference system approach Basin Plan amendment, we will recalculate TMDLs considering all available reference system data.

Comment 102

In sum as written, the San Diego Creek and Beach Bacteria TMDL will not lead to water quality standards attainment. Instead, the San Diego Regional Board should follow an approach similar to the Los Angeles Region approach in the Santa Bay Beaches Bacteria TMDLs and the Malibu Creek Bacteria TMDL. The approach taken in the development of these TMDLs has been accepted by the State Water Resources Control Board and the US Environmental Protection Agency.

Response: We disagree that the proposed TMDLs will not lead to water quality standards attainment, in part because the technical approach for wet weather was essentially identical to the approach used in developing the TMDLs in Santa Monica Bay. We assume the commenter is referring to the use of loads, instead of exceedance days, for expressing TMDLs as the main difference between the two projects. The "load" metric will not necessarily be used as the metric for determining TMDL compliance. We discussed this issue at length with our Stakeholder Advisory Group, which led us to add clarification in various places in the Technical Report (see section 11.5.1, for instance). We believe expressing TMDLs and WLAs as "loads" is appropriate for the reasons outlined in the response to Comment 147.

5.3 Water Quality Objectives/Indicator Bacteria

Comment 103

Section 3.2 of the Report states, "the waterbodies included in this project were listed as impaired primarily because of non-attainment of the indicator bacteria WQOs associated with contact recreation [REC-1]." Why, then, are Total Coliform objectives associated exclusively with SHELL use in marine waters added into this TMDL; and in fact applied at a critical point in freshwater upstream of any saltwater influence? Current science, EPA guidelines and local REC-1 objectives fully acknowledge that there is ***no*** epidemiological correlation between Total Coliform and public health risk for contact recreation. Furthermore, inclusion of the SHELL Total Coliform objectives has led to a flagrant logical absurdity in the final numeric targets (Tables 4-2, 4-3, and 4-6): Fecal Coliform is a *subset* of Total Coliform, but the final targets for Fecal Coliform are listed as *higher* than for Total Coliform.

Response: Water quality objectives for total coliform were used to calculate TMDLs because, although some waterbodies were specifically listed for impairment of the REC-1 beneficial use, all marine waters (shoreline and some estuarine) have the SHELL beneficial use designation. Since all inland surface waters eventually drain to these marine waters, bacteria densities of inland surface waters must be protective of the downstream SHELL beneficial use. Calculating TMDLs for total coliform in freshwater creeks and rivers using the SHELL WQO as a numeric target ensures that the SHELL beneficial use is protected at the shoreline. Prior to the point of discharge to the Pacific Ocean, the creeks and rivers are only required to meet the REC-1 WQOs.

We disagree that local REC-1 objectives acknowledge that there is no epidemiological correlation between total coliform and public health risk for contact recreation. Effective February 14, 2006, the SWRCB updated the Ocean Plan to maintain WQOs for total and fecal coliform. (Although the USEPA recommends using enterococci and *E. coli* as WQOs, states have the ability to use more stringent criteria.) The Ocean Plan contains the WQOs that are relevant to these TMDLs.

We are aware that fecal coliform is a subset of total coliform. Since total coliform are driven by the more stringent SHELL WQOs, the result is that total coliform numeric targets are lower than fecal coliform numeric targets. The apparent discrepancy between total coliform and fecal coliform TMDLs disappears when beneficial uses are taken into account.

Comment 104

P. 36, Section 4.1.2: For both the interim and final wet weather numeric targets the total coliform values are less than the fecal coliform values. This illogical discrepancy (total coliform values should be inevitably be greater than fecal coliform values since by definition total coliforms are the sum of fecal plus all other coliforms) will by default create a stricter bacteria standard that will be impossible to meet.

Response: Please see the response to Comment 103.

Comment 105

P. 38, Section 4.2.1: For both the interim and final dry weather numeric targets the total coliform values are less than the fecal coliform values. This illogical discrepancy (total coliform values should be inevitably be greater than fecal coliform values since by definition total coliforms are the sum of fecal plus all other coliforms) will by default create a stricter bacteria standard that will be impossible to meet.

Response: Please see the response to Comment 103.

Comment 106

The technical analysis is based on a policy decision made by the staff that 303(d) listings must be determined from an exceedance of any of three bacterial indicator organisms. The best available science clearly indicates that 2 of the 3 indicator organisms employed by staff (total and fecal coliform) are uncorrelated with risk to human health and thus, to the protection of the beneficial use. We believe that the Regional Board should consider the policy implications of this assumption relative to current and future listings, as well as the implications of this assumption as it constrains the ability of the staff to evaluate impairment based on the best available scientific information. Staff efforts should be focused on the indicators that have the strongest link to public health issues and that will result in true protection of beneficial uses. Limited staff and resources should not be wasted on researching and controlling indicators that will not result in a measurable improvement of protecting public health.

Response: That a listing decision is determined by exceedance of any of the three bacteria indicator organisms is not a policy decision made by staff; listing decisions are based on the procedures in the Listing Policy. Since the Basin Plan and Ocean Plan include WQOs for total and fecal coliform, we are required to develop TMDLs for waterbodies not meeting these WQOs. This TMDL process is not the forum for revising objectives. We agree that efforts by all parties should be focused on the indicators that have the strongest link to public health issues and will result in true protection of beneficial uses; therefore we encourage dischargers to focus their efforts on abating anthropogenic sources of bacteria. The discharges may choose to conduct special studies to identify controllable anthropogenic bacteria sources to help focus their load reduction efforts. We believe that focusing on controllable sources may prove effective at protecting beneficial uses, as was the case with Mission Bay. In this waterbody, diversion of urban runoff and other management measures essentially eliminated significant threats to human health during dry weather conditions.

Comment 107

It is becoming more and more widely acknowledged that the traditional indicator bacteria can provide unreliable estimates of potential public health impacts. EPA is developing improved indicators and others are developing new methods that identify specific contamination sources and/or pathogens. Thus, the TMDL targets are based on measurements that we cannot confidently link to the desired policy outcome (i.e., lowering public health risk). Admittedly, the Regional Board

is operating under certain constraints in terms of the TMDL schedule and is not able to delay implementation until these improved indicators and methods are available. However, simply stating that the TMDL targets may be reviewed and revised as better information becomes available is an inadequate policy response. Municipalities and other entities must soon start to make costly, irreversible, and long-term decisions about how to meet the TMDL targets. There is a large amount of uncertainty about whether and to what extent these decisions will actually reduce health risks.

Response: We disagree that traditional indicator bacteria provide "unreliable" estimates of potential public health impacts; however, we recognize that the accuracy of the correlation of bacteria densities to health risks is the subject of recent discussions. For this reason, several studies have been completed or initiated to examine the health risks associated with indicator bacteria, as well as potentially new indicators of health risks.

We are obligated to proceed with utilizing WQOs consisting of total coliform, fecal coliform, and enterococci bacteria to calculate TMDLs because they are the established indicators of risk to public health. Under Clean Water Act (CWA) section 303(d), the San Diego Water Board is obligated to develop TMDLs for waters not meeting water quality standards (WQOs and the beneficial uses they are designated to protect). TMDL calculations must be based on existing WQOs.

The administrative proceedings at the San Diego Water Board level are not the appropriate forum for investigating the validity of the bacteria WQOs. Reevaluation of water quality criteria that are the basis for WQOs cited in the Basin Plan takes place at the USEPA level. Should USEPA promulgate new water criteria, then the WQOs in the Basin Plan will be updated accordingly and TMDLs recalculated.

The SWRCB is considering the adoption of statewide bacteria criteria for inland surface waters. Although the bacteria indicator WQOs will be under review by the SWRCB, adoption and implementation of these TMDLs should move forward. Mechanisms exist to modify the bacteria TMDLs if and when the regulatory framework changes.

We further disagree with the commenter that achieving the TMDL targets might not result in the desired outcome, i.e. lowering public health risk. If the numeric targets are overly conservative in terms of lowering risk to public health, then the desired policy outcome (sufficiently high receiving water quality) has been achieved if WQOs have been attained. At the same time, we recognize that reducing bacteria loads is costly. Therefore, we will continue to work with our stakeholders to refine the TMDLs to ensure that public health is protected and that public money is prudently spent.

Comment 108

The City is pleased to see that the Report had been revised to acknowledge the potential value of future efforts, such as the recently funded epidemiology and microbial source tracking study at Doheny State Beach and potential role that the study results may have on recalculating WQOs, if necessary.

Response: The commenter refers to section 11.6 of the Technical Report, which describes how future studies can be used to fill in data gaps related to TMDL analysis. TMDLs can be recalculated for a number of reasons, including the availability of new data for model calibration and validation, or the establishment of new WQOs, on which TMDLs are based. WQOs are not recalculated by the San Diego Water Board. WQOs are based on water quality criteria developed by USEPA, which are in turn based on epidemiology studies.

Comment 109

The City of San Diego coordinated with Weston Solutions regarding the Bacterial Monitoring and Source Tracking for Pacific Beach Point (CD attached). The study objective was to design and implement a bacterial investigation that would identify sources of bacterial contamination impacting the receiving waters at PB Point and subsequently recommend management actions to reduce or eliminate those sources. The study found that the bacterial sources from the wrackline, birds and flies, not sewage or urban runoff. This study points to the need for addition research to determine the human health risk for REC1 use when there is no human sewage and urban runoff sources. This information can also be used to help develop a natural sources exclusion approach to be included in the Basin Plan.

Response: Comment noted. This type of information could be used to recalculate TMDLs based on the natural sources exclusion approach. We strongly encourage additional research and special studies that can be used to improve the TMDLs.

Comment 110

Since EPA's Fecal Coliform and Enterococcus WQOs represent statistically equivalent health risks for contact recreation, the TMDL should allowance for compliance to be determined with either the FC or the ENT targets, not necessarily both of them.

Response: The commenter points out that the EPA's fecal coliform and enterococcus WQOs represent statistically equivalent health risks for contact recreation. This means that exceeding the fecal coliform **or** entrococcus WQOs would present an increased health risk for water contact recreation. In other words, if the entrococcus target is exceeded, but the fecal coliform target is not exceeded, or vice versa, there is an increased risk to human health. Therefore, allowing compliance with either fecal coliform or enterococcus would not be protective of the REC-1 beneficial use if one bacteria indicator is exceeded, and the other is not. Compliance with the WQOs for all indicator bacteria is required to be protective of health risks for REC-1 beneficial uses.

Comment 111

The TMDLs should be based on the California Department of Health Services beach bathing water standards.

The Santa Monica Bay Beach Bacteria TMDLs were developed over a three year period with extensive scientific analysis of monitoring databases and epidemiology studies. The

TMDL has been in place for nearly four years and has already resulted in dramatic improvement in beach water quality during the AB 411 months between April and October. The Santa Monica Bay approach is as follows:

- TMDL targets are based on allowable exceedances of all seven of the state's beach water quality standards in the California Ocean Plan:
- Single sample
    - Total coliform 10,000 MPN
    - Fecal coliform 400 MPN
    - Enterococcus 104 MPN
    - Total/fecal ratio <= 10
- Geometric mean
    - Total coliform 1,000 MPN
    - Fecal coliform 200 MPN
    - Enterococcus 35 MPN

Response: The bacteria TMDLs are calculated using the same numeric targets as the WQOs described in this comment. The WQOs described in this comment are applicable to beaches, therefore where WQOs for freshwater are more stringent, these are used instead. Single sample maximum values are used for wet weather TMDL calculation, and geometric mean WQOs are used for dry weather TMDL calculation. The total/fecal ratio was not used because TMDLs are expressed on a loading basis as described in the response to Comment 147.

Different dry weather and wet weather numeric targets were used because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions. Single sample maximum WQOs were used as wet weather numeric targets because wet weather, or storm flow, is episodic and short in duration, and characterized by rapid wash-off and transport of high bacteria loads, with short residence times, from all land use types to receiving waters. Geometric mean WQOs were used as numeric targets for dry weather periods because dry weather runoff is not generated from storm flows, is not uniformly linked to every land use, and is more uniform than stormflow, with lower flows, lower loads, and slower transport, making die-off and/or amplification processes more important. Please see sections 4.1.2 and 4.2.1 of the Technical Report for a summary of the numeric targets.

Comment 112

The TMDL requires bacterial reductions in the watershed based on occurrence of three bacterial indicators during both wet and dry seasons. Scientific evidence available since 1986[14,15,16] clearly indicates that there is no scientifically valid relation between the

[14] U.S. EPA Ambient water quality criteria for bacteria; EPA440/5-84-002; 1986;
[15] Pruss, A., Review of Epidemiological Studies on Health Effects from Exposure to Recreational Water. Int J Epidemiol. 1998, 27, (1),1-9.
[16] Wade, T.J., Pai, N., Eisenberg, J. & Colford, J.M., Do US EPA water quality guidelines for recreational waters prevent gastrointestinal illness? A systematic review and meta-analysis. Environ. Heal. Perspec. 2003, 111, (8), 1102-09.

occurrence of two (total coliform and fecal coliform) of the three indicators employed and adverse human health effects, and thus protection of the REC-1 beneficial use.

Response: Please see the response to Comment 107.

Comment 113

The single sample maximum value water quality objective is used as the basis for the wet weather TMDL analyses. However, careful review of the original documentation that explains the derivation of the single sample maximum[17] clearly indicates that this value was not intended to apply during wet weather events in general, and particularly not in the case of stormwater dominated waterbodies.

Response: We are familiar with the documentation that the commenter refers to, but we do not agree that it indicates that the single sample maximum was not intended to apply during wet weather events in general. The original documentation states that "To set the single sample maximum, it is necessary to specify the desired chance that the beach will be left open when the protection is adequate."

In southern California and the San Diego Region, the beaches are open year-round, even during wet weather conditions. There are many members of the public that may recreate in the water during wet weather (e.g., surfers). Therefore, protection must be adequate year-round and during wet weather conditions.

Many of the creeks in the Region only flow during stormflow conditions. However, the levels of bacteria that are transported in storm flow by the creeks are often elevated. Because the creeks in the Region ultimately flow out to ocean during wet weather conditions, the bacteria levels in the creeks, and ultimately the ocean must meet either the geometric mean or the single sample WQOs to be protective of recreational swimmers.

A geometric mean objective cannot be used for wet weather because a storm even doesn't last for 30 days. A geometric mean must be calculated with several data points, ideally equally spaced over 30 days. Storm events in southern California are typically short term and episodic, and collecting enough samples to calculate a geometric mean would be difficult and costly, nor would it make sense to do so because of the short duration. The sampling results would likely result in exceedances of the geometric mean more frequently than exceedances of the single sample maximum WQOs. Because wet weather, or storm flow, is episodic and short in duration, and characterized by rapid wash-off and transport of high bacteria loads, with short residence times, the single sample maximum is the most appropriate WQO for the wet weather TMDL analysis.

Comment 114

California's overall technical approach for addressing bacterial issues appears to be outdated and not in line with the latest EPA guidance. EPA has moved away from the use of Total Coliforms, and towards Enterococci for effects to bathers and swimmers (REC-

[17] U.S. EPA Ambient water quality criteria for bacteria; EPA440/5-84-002; 1986.

1) in marine waters [note E-Coli for same in freshwater]. For SHELL, they recommend fecal coliform. Consideration should be given for using these as the indicator parameters.

Response: The commenter correctly states that USEPA recommends using only enterococci and *E. coli* to evaluate potential health risks for water contact recreation uses. However, states have option of adopting more stringent criteria. The existing Basin Plan and the Ocean Plan both have WQOs for total coliform, fecal coliform, and enterococci for REC-1, and total coliform for SHELL.

We are obligated to proceed with utilizing WQOs consisting of total coliform, fecal coliform, and enterococci bacteria to calculate TMDLs because they are the established indicators of risk to public health. Under Clean Water Act (CWA) section 303(d), the San Diego Water Board is obligated to develop TMDLs for waters not meeting the existing water quality standards in the Basin Plan and/or Ocean Plan (WQOs and the beneficial uses they are designated to protect). TMDL calculations must be based on existing WQOs.

Comment 115

The technical basis/rationale should be provided for the bacterial standards used, particularly in relation to the interim and final numbers (review of the Executive Summary and the document through Section 8 [p.72] did not uncover this). Review of the Basin Plan also failed to uncover the basis for these values.

Response: The technical basis/rationale for the bacterial standards used is not required to develop the TMDLs. However, the rationale for the use of the WQOs for TMDL development is discussed in the response to Comment 107.

Comment 116

As mentioned in our letter of September 6, 2005, we remain concerned about building a TMDL while an acknowledged gap exists in the link between indicator bacteria and human pathogens. The lack of epidemiological studies that might establish a link, or lack thereof, between nonhuman sources of bacteria and the risk of illness must be resolved. The Revised Technical Report states, "The San Diego Water Board recognizes that there are potential problems associated with using bacteriological WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges." The failure to establish this critical link will lead to expensive and costly testing, structural investments, and changes to accepted cultural practices by farmers that might not be needed. While the authority to establish the TMDL is clear, there is a responsibility to the public not to do it in a manner that is arbitrary and capricious.

Response: As discussed in the response to Comment 107, we are obligated to proceed with utilizing WQOs consisting of total coliform, fecal coliform, and enterococci bacteria to calculate TMDLs. Under Clean Water Act (CWA) section 303(d), the San Diego Water Board is obligated to develop TMDLs for waters not meeting the existing water quality standards in the Basin Plan and/or Ocean Plan (WQOs and the beneficial uses they are designated to protect).

While the risk of contracting a water-born illness from contact with runoff free of sewage discharges is not known, there are some pathogens (e.g., *giardia* and *cryptosporidium*) that originate from animal hosts, such as domesticated animals (e.g., cows, sheep, horses, etc.), which are known to cause human illness. Until epidemiological studies establish that there is no link between nonhuman sources of bacteria and the risk of human illness, the WQOs in the Basin Plan and/or Ocean Plan and the conservative nature of the TMDL calculations are appropriate.

5.4 Beneficial Uses

Comment 117

SHELL Beneficial Use and Water Quality Objectives (WQO): We are concerned that the SHELL total coliform WQO has been inappropriately applied in the final TMDLs. The TMDL document states that "final dry weather total coliform TMDLs utilize the SHELL WQO as a numeric target because this WQO is more stringent than the REC-1 WQO for total coliform". There is no basis provided in the document that justifies using the more stringent SHELL WQO in place of the REC-1 WQO.

It is our understanding that the San Diego Region waters are 303(d) listed as impaired for REC-1 beneficial uses, not SHELL. In this case, we believe the REC-1 WQO should be utilized in the final TMDLs for waters that are 303(d) listed as impaired for REC-1 beneficial uses.

Response: The bacteria TMDLs were calculated from modeled flow at the bottom of the watershed at critical points. These critical points are nodes in the model representing locations just before inter-tidal mixing occurs in the surf zone. The basis for using the SHELL water quality objective as the numeric target for total coliform TMDLs, is justified because the flow from the watershed will end up discharging to the Pacific Ocean shoreline or San Diego Bay. All beneficial uses of a waterbody must be protected and for the Pacific Ocean and San Diego Bay, this includes SHELL which also is the most sensitive water quality objective for total coliform bacteria.

In the 2006 update of the List of Water Quality Limited Segments, the State Board did not evaluate data with respect to the SHELL water quality objective for bacteria. Thus, the 2006 list is likely not accurate with regard to water quality supporting the SHELL use at Pacific Ocean shorelines. The information presented in the Technical Report show a significant number of exceedances of the SHELL water quality objective. See Appendix H, Figures H-3 and H-4.

Comment 118

TMDLs for impaired saltwater beaches should be expressed separately from TMDLs for impaired Freshwater creeks for both wet and dry weather. Specifically, Interim Beach TMDLs should be defined in terms of allowable exceedance days along the beaches, which have already been calculated for wet weather (Table 8-2), so little additional effort is needed to make this change in the text, and which offer a useful, easily-understandable metric. Separation of saltwater and freshwater TMDLs is supported by the lack of established linkage between creek loads and beach exceedances. The wet-exceedance allowances in the TMDL Report were based on studies only at reference pristine saltwater beaches – with *no* data available within the creeks discharging to those beaches. In some cases, sand berms had formed naturally at the creek mouth, so that beach exceedances sometimes occurred despite *no creek discharge at all*. For both wet and dry weather, the "critical point" of the model is located in freshwater upstream of many factors (salt vs. fresh; dilution/assimilation; beach bacteria sources such as sea birds and wrack line; single-sample vs. geomean criteria; natural exceedance allowance, etc.) that

confound the creek/beach relationship. This has all contributed to ***model results that defy common sense: at Aliso, for example, the daily maximum load of fecal coliform bacteria on one of the 15 allowable wet-weather exceedance days is 8,000 times higher than the daily allowable load of bacteria on any one of the 296 dry-weather days***.* Separation of the beach and creek TMDLs would be a simple and practical way to rectify these modeling discrepancies *now* without requiring significant supplemental staff time. Better research data from ongoing reference-beach and creek-natural-loading studies will soon be available to better inform our understanding of actual beach/creek bacteria-load relationships. The report already makes provision for future updating and correcting of the TMDLs as these findings are developed.

*Calculated as 968,920 billion/15 days divided by 2,383 billion/296. If we attempt to guesstimate the more obvious correction factors (x2 for numeric target of 400 vs. 200; x9 for 90% natural bacteria not accounted under dry weather, and x3 for 2/3 of dry weather flows being anthropogenic), that would still be a predicted wet:dry load relationship of only x54, not x8,000.

Response: The rationale for calculating one TMDL for each indicator bacteria for a creek and its downstream beach is discussed in section 4.4 of this Appendix. Additionally, the WLAs are expressed as loads (billion MPN/year) as opposed to exceedance days for the reasons outlined in the response to Comment 147.

As stated in the comment, the exceedance frequency during wet weather described in the Technical Report were based on studies only at a reference saltwater beach, with no data available within the creek discharging to the beach. The 22 percent allowable exceedance frequency for wet weather was based on measurements in the wavewash at Leo Carillo beach (downstream of the Arroyo Sequit watershed) in Los Angeles County. In this situation, creeks were not obstructed from flowing to the beach; therefore bacteria loading was presumed to originate mostly from the watershed. However, other local beach sources downstream of the mixing zone such as birds, marine mammals, and bacteria re-growth on the wrack line, likely contributed to exceedances of the WQOs.

There is little data at this point regarding exceedances of the single sample maximum WQOs in a reference system during dry weather. Some exceedances have been observed at San Onofre beach in San Diego County, even though berms separating the creeks from the beaches are in place most of the time. However, these exceedances are very few (exceedances for enterococci are 1 percent, zero for total and fecal coliform). Monitoring results from weekly beach sampling are presented in Table 4-4. Because the berms are in place, exceedances are most likely caused by local sources on the beach, downstream of the mixing zone. More recently, weekly data from the winter-dry beach and creek monitoring conducted by the SAG at San Onofre and San Mateo beaches from November 2004 through March 2005 showed that the bacteria densities at the creek sampling locations were typically higher or similar to bacteria densities at the ocean sampling locations. Although this data set is limited, it does support the dischargers claim that natural sources in the watershed may be causing exceedances, which may not be detected with beach sampling.

SCCWRP has initiated a study to quantify background loading from a reference watershed(s) during both wet and dry weather (Eric Stein, SCCWRP, personal communication, April 3, 2006). The goal of the study will be to characterize the background loading of bacteria from a number of reference watersheds under various hydrological conditions. The watersheds vary by size, location, and other parameters. Despite the quantification of loading during dry weather conditions, a reference watershed approach will not be used to calculate dry weather TMDLs. While most studies quantify the frequency of exceedances of the single sample maximum WQOs, TMDL calculation during dry weather makes use of the geometric mean WQOs. An allowable exceedance frequency does not apply to a geometric mean because the geometric mean is an average value over the course of 30 days.

We disagree that model results defy common sense. The reason for the sizeable difference between the TMDLs for wet and dry weather is due to the difference in magnitude between these two types of flows. Wet weather flows are typically orders of magnitude higher than dry weather flows, thus the wet weather bacteria loads are orders of magnitude higher. For example, in Aliso Creek, wet weather flows were predicted to be about 1,650 cubic feet per second (cfs) in the critical wet year, while dry weather flows were estimated at 1.6 cfs. Since the flow rate increases by 3 orders of magnitude during wet flows, so does the assimilative capacity of the waterbody. The waterbody can receive significantly higher loads during wet weather events because the additional volume provides dilution and the ability to assimilate the pollutant.

Comment 119

TMDLs for impaired saltwater beaches should be expressed separately from TMDLs for impaired Freshwater creeks for both wet and dry weather. Specifically, Interim Beach TMDLs should be defined in terms of allowable exceedance days along the beaches, which have already been calculated for wet weather (Table 8-2), so little additional effort is needed to make this change in the text. Separation of saltwater and freshwater TMDLs is supported by the lack of established linkage between creek loads and beach exceedances in the reference data. The wet-exceedance allowances in the TMDL Report were based on studies only at reference pristine saltwater beaches – with *no* data available within the creeks discharging to those beaches. In some cases, sand berms had formed naturally at the creek mouth, so that beach exceedances sometimes occurred despite *no creek discharge at all*. For both wet and dry weather, the "critical point" of the model is located in freshwater upstream of many factors (salt vs. fresh; dilution/assimilation; beach bacteria sources such as sea birds and wrack line; single-sample vs. geomean criteria; natural exceedance allowance, etc.) that confound the creek/beach relationship. This has contributed to questionable model results: at Aliso, for example, the daily maximum load of fecal coliform bacteria on one of the 15 allowable wet-weather exceedance days is 56 times higher than the daily allowable load of bacteria on any of the 296 dry-weather days**.** Separation of the beach and creek TMDLs would be a simple and practical way to rectify these modeling discrepancies *now* without requiring significant supplemental staff time. Better research data from ongoing reference-beach and creek-natural-loading studies will soon be available to better inform

our understanding of actual beach/creek bacteria-load relationships, but the report already makes provision for future updating and correcting of the TMDLs as these findings are developed.

Response: Please see the response to Comment 118.

Comment 120

TMDLs for impaired saltwater beaches should be expressed separately from TMDLs for impaired freshwater creeks for both wet and dry weather. Interim Beach TMDLs should be defined in terms of allowable exceedance days along the beaches, which have already been calculated for wet weather (Table 8-2) and which would be consistent with locally-established precedent in RWQCB Region 4. In keeping with the saltwater/freshwater separation, SHELL Total Coliform WQOs should not be applied to freshwater creeks. Separation of saltwater and freshwater TMDLs is supported by:

- Lack of established linkage between creek loads and beach exceedances in the reference data. The wet-exceedance allowances in the TMDL Report were based on studies only at reference pristine saltwater beaches – with no data available within the creeks discharging to those beaches. In some instances, sand berms had formed naturally at the creek mouth, so that beach exceedances sometimes occurred despite no creek discharge at all. Years of data at Aliso Creek and Beach indicate that more typically (especially in dry weather) freshwater creek exceedances far outnumber saltwater beach exceedance days, and the magnitude of creek exceedances is also much higher.
- The TMDL Report's stacking-up of reference beach exceedance days, freshwater bacteria load calculations, and multiple unquantified margin-of-safety assumptions has produced model results so skewed as to be profoundly implausible. The Total Maximum Daily Load is supposed to represent the amount of a pollutant that a water body can assimilate without exceeding water quality objectives. Why would a beach's maximum daily load vary by 4 orders of magnitude (10,000 times) between wet and dry weather? Consider the one example of Aliso Creek: The TMDL Report (Table 9.1) says, in effect, that 968,920 billion fecal coliform bacteria (the 90.1% of creek total wet-weather bacteria load defined as non-controllable non-point "natural background") are needed to cause 15 days (per Table 8.2) of allowable "natural background" fecal coliform exceedance at the beach annually. On average, that's a load of at least 64,595 billion bacteria to produce one exceedance day at the beach. How can it be plausible that the daily TMDL load for dry weather (8 billion bacteria for each of the 296 dry days per year per Table 8-3) would be only 0.012% (8/64,595th) of the daily TMDL load needed to produce one beach exceedance day in wet weather? Or that the dry weather load for the entire 296-day dry season would be only 3.7% (2,383/64,595) of the allowable load for one wet-weather day?
- Separation of the beach and creek TMDLs would be a simple and effective way to rectify these discrepancies now without requiring significant supplemental staff time. The report already makes provision for future updating and correcting of

the TMDLs and Basin Plan as better research data from current reference-beach and creek-natural-loading studies lead to better understanding of actual beach/creek bacteria-load relationships.

Response: Please see response to Comment 118.

Comment 121

SHELL Total Coliform numeric targets should not be selectively forced onto the impaired freshwater creeks. SHELL Total Coliform Water Quality Objectives apply to marine salt waters, not to inland surface freshwaters. Tables 4-3 and 4-6 explicitly and wrongly place Total Coliform numeric targets on Aliso Creek and the San Diego River. The excuse is given that this is necessary for officially-impaired creeks in order to protect the impaired downstream beach. But Total Coliform TMDLs (Tables 9-3 and 9-4) are calculated for every creek mouth and storm drain outfall to all the impaired beaches, regardless of whether the creeks or storm drains are specifically 303(d) listed as impaired. The implicit effect of singling out Aliso Creek and the San Diego River in Tables 4-3 and 4-6 is to force Total Coliform WQOs onto the two freshwater creeks' entire waterbodies, not just the mouths. This is inappropriate and improper.

Response: The comment that we are singling out Aliso Creek and the San Diego River as being the only fresh waterbodies with a need to protect a downstream SHELL beneficial use is incorrect. For this reason, the discussion of numeric targets pertaining to these waters was modified in sections 4.1 and 4.2 to avoid the misunderstanding that they are being singled out.

Although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these waters where they discharge to the Pacific Ocean must be at a level that support SHELL use at the approximate point where the creeks and rivers discharge at the shorelines. Thus, the SHELL WQO for total coliform is the appropriate numeric target for the TMDLs for impaired creeks and rivers even though they do not support SHELL use. Although REC-1 WQOs for fecal coliform and enterococci apply throughout the watersheds, the total coliform TMDLs for SHELL must be met only at the bottom of the watershed in the marine waters where creeks and rivers discharge to the Pacific Ocean.

Please see section 4.4 of this appendix for a discussion about the difference between the critical points used to model TMDLs and potential points that may be selected for compliance with the TMDLs.

Comment 122

SHELL Total Coliform numeric targets should not be selectively applied to the impaired freshwater creeks. SHELL Total Coliform Water Quality Objectives apply to marine salt waters, not to inland surface freshwaters. Tables 4-3 and 4-6 explicitly and wrongly place Total Coliform numeric targets on Aliso Creek and the San Diego River. The reason given is that this is necessary for officially-impaired creeks in order to protect the impaired downstream beach. But Total Coliform TMDLs (Tables 9-3 and 9-4) are

calculated for every creek mouth and storm drain outfall to all the impaired beaches, regardless of whether the creeks or storm drains are specifically 303(d) listed as impaired. The implicit effect of singling out Aliso Creek and the San Diego River in Tables 4-3 and 4-6 is to force Total Coliform WQOs onto the two freshwater creeks' entire waterbodies, not just the mouths. This is inappropriate and imposes stricter water quality standards than those identified in the Basin Plan.

Response: Please see the response to Comment 121.

Comment 123

The technical analysis is based on the assumption that REC-1 is appropriate in all segments of all waterbodies at all times of the year. Due to the variable nature of bacterial contamination, seasonal and frequency of use/potential exposure based considerations should be addressed. This is especially evident at Aliso and Chollas Creeks, where the beneficial use for the creek is designated not as REC-1, but as REC-2 (potential REC-1) in the Basin Plan. The "potential" designation indicates that (although there may be plans, possibilities or desires for REC-1 use), actual existing or pre-existing REC-1 use has not been established. Compared to popular public ocean beaches where heavy dry-weather use justifies using the "designated beach" water quality objectives, compliance within Aliso and Chollas Creeks should be judged by the REC-2 objectives; and the REC-1 creeks or creek segments should be selectively subject to "moderate full contact recreation", "lightly used full body contact recreation", or "infrequently used full body contact recreation" designations and objectives depending on site-specific usage conditions, as recommended by US EPA and referenced in the Basin Plan. Similarly, wet-weather targets for ocean beaches should utilize the "lightly used" or "infrequent use" objectives (depending on location) to reflect much lower usage rates during rain.

Response: The TMDLs make no assumption about the water quality standards. The standards are established in the Basin Plan and Ocean Plan. The Clean Water Act (CWA) requires that the TMDLs ensure that water quality supports existing and potential uses. Use of the "designated beach" water quality objective as a TMDL numeric target is reasonable due to the high-density population along the Southern California coast and the general appeal of the ocean and beaches for contact and non-contact recreation.

The dischargers must provide evidence to justify classifying an ocean beach as a "moderately or lightly used area." If compelling evidence is provided, the "moderately or lightly used area" enterococci WQOs could be used as the wet weather numeric target to revise the TMDLs.

Comment 124

The technical analysis is based on the assumption that the Regional Board's policy is that REC-1 is appropriate in all segments of all streams in all watersheds at all times of the year. Due to the variable nature of bacterial contamination, seasonal and frequency of use/potential exposure based considerations should be addressed.

The technical analysis is based on the assumption that it is the Board's policy throughout the entire Region that all segments of all waterbodies in all watersheds are subject to "designated beach" water quality objectives rather than applying "moderate full contact recreation", "lightly used full body contact recreation", or "infrequently used full body contact recreation" designations, as recommended by US EPA and referenced in the Basin Plan.

Response: Please see the response to Comment 123.

Comment 125

Table 9-4 - Final TMDLs for Total Coliform – The total coliform load assigned to Chollas Creek appears to reflect the SHELL fecal coliform water quality objective standard instead of the REC 1 water quality objective. This is inconsistent with the statement in Section 4.2.1 that SHELL beneficial use would not be assigned to Chollas Creek and other creeks. Please modify Table 9-4.

Response: The commenter correctly states that there is an inconsistency with the text of section 4.1.2 and Table 9-4. Although the text omits the application of SHELL numeric targets to Chollas Creek TMDLs for total coliform, Table 9-4 contains total coliform TMDLs for Chollas Creek (total coliform WQOs only pertain to SHELL beneficial use). As opposed to modifying Table 9-4, the text in section 4.2.1 has been modified so that the total coliform WQOs associated with the SHELL beneficial use are the indicated numeric targets for TMDLs for the impaired creeks, including Chollas Creek (the Technical Report previously applied the SHELL WQOs only to Aliso Creek and the San Diego River).

Although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these waters where they discharge to the coastal waters must support the SHELL use at the approximate point where the creeks and rivers discharge at the shorelines. Thus, the SHELL WQO for total coliform is the appropriate numeric target for the creeks and rivers even though they do not support SHELL use. Although REC-1 WQOs for fecal coliform and enterococci must be met throughout the watersheds, the total coliform TMDLs for SHELL use must be met only at the bottom of the watershed in the marine waters where creeks and rivers discharge to coastal waters. See section 4.4 of this appendix.

Comment 126

The technical approach assumes that there is a direct relationship between the control of bacteria loading during rainfall events and the protection of recreational uses. The technical approach estimates the total bacterial loading to watersheds, and computes a required bacterial reduction from those loading values. The vast majority of the bacterial loadings occur during rainfall events. Presumably, these rainfall events correspond to times of the year when the actual beneficial use is at its minimum (the number of recreators is least during rainfall events). The technical approach assumes in effect that to protect the use, bacterial loadings must be reduced during these storm events. A much more practical approach, and one consistent with Porter-Cologne would be to prioritize

the reduction of bacterial concentrations during the times when the beneficial use is at its maximum.

Response: We agree that rainfall events correspond to times of the year when the REC-1 beneficial use is at its minimum. However, beneficial uses apply at all times, and therefore must be protected at all times, regardless of season or hydrological conditions. Despite poor water quality, or even dangerous oceanographic conditions, REC-1 use is still occurring during wet weather events and the following 72 hours. The technical approach does assume that to protect the use, bacterial loading must be reduced during these storm events.

We agree that reduction strategies should be prioritized according to when the use is highest, namely the summer dry season. However, this does not obviate the need to eventually address wet weather loads. The compliance schedule does not preclude dischargers from addressing dry weather loads before addressing wet weather loads.

Comment 127

Table 9-4 – Final TMDLs for Total Coliform – The total coliform load assigned to Forrester Creek appears to reflect the SHELL fecal coliform water quality objective standard instead of the REC 1 water quality objective. This is inconsistent with the statement in Section 4.2.1 that SHELL beneficial use would not be assigned to Forrester Creek. Please modify Table 9-4.

Response: The error in Table 9-4 has been corrected as a result of this comment. Only 1 TMDL for each indicator was calculated at the critical point for the San Diego River watershed. Separate TMDLs for the lower San Diego River and Forrester Creek were not calculated. In addition, the text in section 4.1 and 4.2 was modified to show that the SHELL total coliform WQOs was used as a numeric target for TMDLs for bacteria loading from all inland surface waters, including the San Diego River which includes Forrester Creek.

Although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these waters where they discharge to the Pacific Ocean must be protective of the SHELL use at the approximate point where the creeks and rivers discharge at the shorelines. Thus, the SHELL WQO for total coliform is the appropriate numeric target for the TMDLs for beaches even though the creeks that discharge to the beaches do not support SHELL use. Although REC-1 WQOs for fecal coliform and enterococci apply throughout the watersheds, the total coliform TMDLs must be met only at the bottom of the watershed in the marine waters where creeks and rivers discharge to the Pacific Ocean. See section 4.4 for further discussion.

Comment 128

In response to previous critiques regarding the inappropriate application of SHELL saltwater Total Coliform water quality objectives (WQOs) discriminately onto inland freshwater Aliso Creek and the San Diego River, the Revised Draft Report exacerbates its problems by lumping *all* the freshwater creeks *and* their downstream saltwater beaches

into Table 4-3. This change results in A) forcing the more-stringent freshwater Enterococci WQOs to be applied inappropriately to saltwater sites, in addition to B) inappropriately forcing the SHELL Total Coliform WQO onto creeks, for wet weather conditions. The Revised Draft Report also *expands* its inappropriate application of SHELL Total coliform WQO to apply to *all* creeks (not just Aliso and San Diego) for the Dry Weather targets (Table 4-5). The Revised Draft Report attempts to justify these moves by citing the need to control discharge of creeks to protect the beaches, but this argument works in diametrically conflicting directions relative to Total Coliform WQOs (which are more stringent at saltwater) and Enterococci WQOs (which are more stringent at freshwater). The Revised Draft Report also still retains the logical absurdity of the final dry-weather Total Coliform targets being less than the Fecal Coliform targets (despite Fecal Coliform being a subset of Total Coliform biologically).

Response: Please see section 4.4 of this appendix, which explains why one TMDL for each indicator bacteria was calculated for each impaired creek and its downstream beach and where WQOs are applicable. In response to the total coliform/fecal coliform discrepancy, the reason for this discrepancy is that final numeric targets for total coliform are based on the SHELL beneficial use, which is more stringent than WQOs for REC-1. There are no WQOs for fecal coliform for SHELL. Because the WQOs associated with SHELL are more stringent than the WQOs for REC-1, then this results in final numeric targets showing a discrepancy between values for total coliform and fecal coliform.

The result of this discrepancy is that, although the numeric target of 400 MPN/mL is reported for fecal coliform, in practice a lower fecal coliform density will have to be met in order to meet the total coliform target of 230 MPN/mL. This apparent lack of logic disappears when beneficial uses are taken into account.

Comment 129

The Enterococci conundrum could be readily solved by correcting the single-sample wet-weather numeric Enterococci target for creeks to reflect the most appropriate criterion in the Basin Plan. The Basin Plan divides the single-sample Enterococci objectives, used in the TMDL for wet weather, based on ”designated beaches”, “moderately or lightly used areas”, or “infrequently used areas”. The appropriate (in fact, generous) description of actual REC-1 use of creeks under wet weather conditions should be “moderately or lightly used” with a single-sample freshwater Enterococci target at 108 CFU/100 ml; or (more realistically) “infrequently used” with a freshwater Enterococci target at 151 CFU/100 ml. But the Draft Report currently uses the “designated beach” freshwater criterion, which does not realistically describe actual use under wet weather conditions along any of the creeks, many of which are actually designated (even under dry-weather conditions) as REC-2 (with only *potential* for REC-1). The freshwater “designated beach” single-sample WQO is 61 CFU/100 ml, which is unnecessarily *over-protective* relative to the “designated beach” single-sample saltwater criterion, which is 104 CFU/100 ml. Correcting the creek freshwater wet-weather Enterococci criterion to 108 CFU/100 ml would be adequately protective of recreation use at downstream saltwater beaches, given the assimilative capacity and reference-beach allowable exceedances

discussed under Comment #1 above. Making this correction could require the separation calculation of creek and beach TMDLs (for example, separating the "Aliso Creek" TMDLs from the "Aliso Beach" TMDLs), as previously discussed under Comment #2 above. Or more simply and since the difference is slight, **the single-sample 104 CFU saltwater criterion should be applied to both beaches *and* creeks for wet weather.**

Response: The Basin Plan does include saltwater and fresh water enterococci single sample objectives for "designated beaches," "moderately or lightly used area," and "infrequently used area." The Basin Plan does not provide criteria for assigning these categories to beaches. We must use the most conservative WQOs to protect REC-1 users.

To use the saltwater designated beach WQO of 104 MPN/100mL, and assume it supports the REC-1 use in Aliso Creek, we need substantial evidence supporting a conclusion that REC-1 uses of Aliso Creek are moderate to light. However, in response to this comment, the wet weather TMDLs for enterococci were calculated using both 61 MPN/100mL and 104 MPN/mL as the numeric target. The more stringent TMDL applies, unless dischargers provide the San Diego Water Board with substantial evidence that REC-1 use in Aliso Creek, San Juan Creek, Forrester Creek, the San Diego River, and Chollas Creek are at the "moderately or lightly used area" level. See revisions to section 9 of the Technical Report.

Comment 130

The "problem" of Total Coliform targets exceeding Fecal Coliform targets could be solved by recognizing that the broad application of the SHELL Total Coliform numeric targets as currently shown in this Draft Report is unlikely to pass muster as legally supportable:

a. Most of the 303(d) listings to coastal waters were for impairments to REC-1 beneficial use, not SHELL beneficial use. It is improper to require TMDLs for beneficial use impairments that have not been 303(d) listed.
b. Even where the 303(d) beach listings were for SHELL, there is no SHELL beneficial use designation in the Basin Plan for any inland surface water, so SHELL Total Coliform objectives could not properly be applied directly to their tributary freshwater creeks. **Separate calculation and labeling of creek vs. beach-discharge TMDLs for wet and dry weather would enable this Total Coliform issue to be corrected.**
c. Although SHELL is designated for coastal waters at the "Pacific Ocean", it is specifically *not* designated for coastal lagoons at San Dieguito, the mouth of the San Luis Rey River, and the mouth of Aliso Creek (Basin Plan Table 2-3), so these sites could not even be 303(d) listed for SHELL. Total coliform SHELL objectives therefore would not be applicable at these coastal locations.
d. The SHELL Total Coliform WQO of 70 MPN/100 ml in the Basin Plan (compared to 1,000 MPN/100 ml for REC-1 in the Ocean Plan) was originally "borrowed" as a single parameter cherry-picked from a longer list of parameters

in the State's Shellfish Sanitation standards as they are applied to "Approved" commercial shellfish growing grounds. An "Approved Area" means the site is free enough from sewage impacts to mass-propagate shellfish suitable for direct human consumption without cooking or other processing. The only State-authorized commercial shellfishing site in Region 9 is in Agua Hedionda Lagoon, but even this authorization is on a "Restricted" basis (meaning harvested shellfish must be processed or cooked before marketing). The applicable Total Coliform Shellfish Sanitation standard for a "Restricted Area" is 700 MPN/100 ml. Commercial shellfish propagation at any site in Region 9 other than Agua Hedionda is actually prohibited by the State. Furthermore, due to the possibility of biotoxins completely unrelated to Total Coliform, *any* harvesting in Region 9 (by anyone) for raw consumption is prohibited by the State from at least May to October annually (comprising the bulk of the "Dry Weather" period). The Shellfish Sanitation standards also allow for "Conditional" harvesting restrictions based on predictable bacteria-generating events, such as stormwater flows. In the recently-approved Bacteria TMDL for Tomales Bay (an "Approved Area" actively commercially harvested), the TMDL provided for an annual bacteria natural-exceedance allowance for stormflows; and devised a model-calculated Total Coliform standard (95 MPN/100 ml) for dry-weather tributary discharges to account for assimilative processes within the Bay. Within Tomales Bay, the Shellfish Sanitation standard for Fecal Coliform (14 MPN/100 ml geomean) was also applied as necessary to protect the use. The San Diego Region Basin Plan makes no acknowledgement of the Shellfish Sanitation Fecal Coliform standard, which is better correlated to actual fecal contamination and is dramatically more restrictive than the REC-1 standard. Due apparently to the reaction to the Tomales Bay TMDL and the contradictions between Regions with regard to the SHELL WQOs, RWQCB staff have advised the SAG that the State has put a moratorium on adding any new SHELL impairments to the 303(d) list.

Given this context, **a moratorium on enforcing Final Total Coliform TMDLs for SHELL should be explicitly stated in the Report, and considerations for enforcement should be deferred until the related beneficial use questions and appropriate WQOs are better resolved State-wide. For the interim, the Total Coliform target for beaches should be set at the REC-1 Ocean Plan standard for beaches, and Total Coliform should be deleted from the impaired-creek targets. The beach-discharge TMDLs for Total Coliform should be calculated/labeled separately from creeks. No Total Coliform targets or TMDLs should be specified for impaired creeks.**

Response: The development of TMDLs is not strictly limited to the water bodies on the List of Water Quality Limited Segments. The water bodies on the List of Water Quality Limited Segments have been given the highest priority for development of TMDLs. However, at some point in the future, TMDLs will be developed for all water bodies in the San Diego Region based on the beneficial uses and WQOs in the Basin Plan and/or Ocean Plan.

Whether or not shellfish harvesting is taking place for commercial or non-commercial purposes, the fact remains that the entire Pacific Ocean shoreline in the San Diego Region is designated for the SHELL beneficial use. The WQOs are established in the Basin Plan and Ocean Plan and must be used in the development of the TMDL. However, the commenter is correct that the SHELL WQOs only apply where the SHELL beneficial use has been designated in the Ocean Plan, which is in the marine waters of the Pacific Ocean shoreline and San Diego Bay. Thus, the SHELL WQOs are not required to be met in inland freshwater segments. Please see section 4.4 of this appendix for additional explanation about where WQOs are applicable.

The SWRCB chose not to evaluate bacteria data with regard to SHELL WQOs in the update of the 2006 List. However, this does not mean that water quality supports the SHELL use in our region. Whether or not a beach segment is specifically listed for SHELL impairment, SHELL is the most sensitive beneficial use in the watersheds of these TMDLs, and TMDLs were appropriately calculated for total coliform to protect the use.

According to the California Department of Fish and Game, native shellfish populations exist and harvesting is occurring in some coastal areas within the San Diego region,[18] therefore the argument that this use is not valid is unsubstantiated. However, the appropriateness of any standard or WQO must be addressed as a Basin Planning issue, not a TMDL issue. The Triennial Review process is the most appropriate forum for questioning the appropriateness of a beneficial use and/or a WQO.

Comment 131

SHELL Total Coliform numeric targets should not be applied to freshwater creeks. SHELL Total Coliform Water Quality Objectives apply to marine salt waters, not to inland surface waters. This approach wrongly places SHELL Total Coliform numeric targets on fresh waters in the region. This change results in requiring more stringent Total coliform requirements on the creeks. The justification for this approach is to protect the SHELL beneficial use at the downstream beaches. The effect of this is to force the extremely low SHELL Total Coliform WQOs onto entire watersheds, not just the mouths. This is inappropriate, improper, and not fully accounted for in the CEQA analysis.

Based upon evaluation of the data from studies conducted by the City of San Diego, we question the appropriateness of applying REC1 and SHELL beneficial use Water Quality Objectives (WQO) to entire watersheds. The Mission Bay Source Identification Study, funded by the State Water Resources Control Board Proposition 13 funding, found that the majority of the problems at the beaches were from the wrackline and birds. The City conducted the Bacterial Monitoring and Source Tracking for Pacific Beach Point, which built upon the Mission Bay study. This study was a source identification study and concluded that the problems at this beach were attributed to the wrackline, birds, and flies, not sewage or urban runoff.

[18] Robin Lewis and Bill Paznokas, personal communication, November 3, 2006.

The Basin Plan SHELL designation is for the protection of human health from the consumption of shellfish. However, the California Department of Health Services is the state's designated authority regarding the regulation the harvesting and sale of shellfish for human consumption. Their regulations have higher levels of allowed bacteria than the Basin Plan and this TMDL. Therefore, the experts in this field need to be included in the design of the SHELL component of the TMDL to ensure that the numeric limit is appropriate and not overly-conservative. For example, the Tomales Bay TMDL requirements are not as strict as this TMDL and shellfish are commercially harvested in that bay. If the San Diego Regional Board will not unilaterally support an appropriate standard, the City of San Diego recommends that this issue be addressed on a statewide basis.

Because the Regional Board is not funded to do so, the City of San Diego intends to pursue Basin Plan amendments to eliminate SHELL as a beneficial use at the mouth of Chollas Creek and REC-1 as a potential beneficial use throughout the watershed. Review of historical documents indicates that the harvesting of shellfish for human consumption was not occurring at the mouth of Chollas Creek on or after November 28, 1975. The mouth of Chollas Creek has been dredged and surrounded by commercial sites since the 1920's. Additionally, the City of San Diego has provided the Regional Board with documentation that large areas of the creek were channelized prior to the November 1975 Basin Plan adoption date. This documentation will be incorporated into a submittal to the Regional Board requesting the removal of the potential REC1 beneficial use of Chollas Creek.

Response: The commenter incorrectly states that the effect of the TMDL is to force the extremely low SHELL total coliform WQOs onto entire watersheds, not just the mouths. Please see section 4.4 of this appendix, which explains why one TMDL for each bacteria indicator was calculated for each impaired creek and its downstream beach and where WQOs are applicable.

The comment overstates the findings of the Mission Bay Source Identification Study. Keep in mind that this study was conducted during dry weather conditions, not storm flow conditions. Further, since dry weather urban runoff from the surrounding neighborhoods is diverted before reaching Mission Bay, that the predominate bacteria source was birds is not surprising. We would not expect the same finding at a coastal area with no dry weather diversion BMPs. We will work closely with the City of San Diego as it develops information for a Basin Plan amendment regarding REC-1 and SHELL use in Chollas Creek/mouth of Chollas Creek. Please also see the response to Comment 130.

Comment 132

Section 4 Numeric Target Selection: Assigning the marine water quality objectives for shellfishing to fresh water creeks sets overly strict and inappropriate standards for both fecal and total coliform for freshwater systems. The assumptions leading to this assignment are flawed from both a policy and scientific perspective:

a) The Shellfishing beneficial use (SHELL) only applies to coastal marine waters. Freshwater creeks do not support shellfishing habitat or species and are not assigned the SHELL beneficial use nor water quality objectives to support shellfishing activities;

b) Water quality objectives for freshwater were developed with a margin of safety to protect downstream uses. Therefore, the protection of downstream marine habitat has already been considered and accounted for in the development of freshwater bacteria standards. If it was necessary for freshwater discharges to meet shellfish water quality objectives, such objectives would have been applied by the SWRCB to all creeks discharging to the Pacific Ocean through the Ocean Plan;

c) In applying the shellfish water quality objective to freshwater, the resulting total coliform levels are set below fecal coliform levels, which is scientifically impossible, since fecal coliform is a sub-set of the total coliform group.

On a related issue, Board Member Kraus requested staff to, "…provide more clarification with regard to the linkage between creek loads and beach exceedences to help justify why we are addressing beach and creek --- combining beach and creek TMDLs." (February 8, 2006 Regional Board Meeting Transcript, p. 154). This information is necessary to address the shellfish water quality objective issue and has not been provided

Response (a): Please see section 4.4 of this appendix.

Response (b): Downstream beneficial uses are not considered in the establishment of a WQO or its margin of safety; the margin of safety accounts for scientific uncertainty in the WQO in the immediate waterbody to which it is applied. Therefore, WQOs established for freshwaters are designed to protect the beneficial uses of freshwaters, and do not consider downstream marine beneficial uses.

In calculating TMDLs, we are not imposing marine beneficial uses onto freshwaters. Rather, we are protecting both types of waterbodies and associated beneficial uses by regulating discharges so that both freshwater and downstream marine WQOs are considered and maintained.

Response (c): Please see the response to Comment 103.

Comment 133

Table 4-2- This table applies a reverse tributary rule that does not exist in the Basin Plan. The text on page 38 indicates "Specifically, the water quality objectives for Enterococci are more stringent for creeks than beaches. Since beaches are downstream of creeks, and numeric targets are equal to WQOs (water quality objectives), TMDLs for beaches are calculated using the more stringent Enterococci standard on the downstream beaches will result in waste load allocations that are overly conservative. Please revise the table appropriately.

Response: Please see section 4.4 of this appendix, which explains why the creek enterococci WQO was used as the numeric target for TMDLs for San Juan Creek, Aliso

Creek, the San Diego River, and Chollas Creek, instead of the less stringent ocean enterococci WQO.

Comment 134

Tables 4-2, 4-3, 4-4, and 4-5, SHELL Total Coliform numeric targets should not be used for the mouth of San Luis Rey River, the coastal lagoon of San Dieguito, and the mouth of Aliso Creek, which do not have a SHELL designation in Table 2-3 (pages 2-47, 2-48) of the Water Quality Control Plan for the San Diego Basin (9), September 8, 1994. Although SHELL is designated for coastal water of the Pacific Ocean, the tributary rule does not apply to the ocean, which is covered by the Ocean Plan, not the inland Basin Plan. These changes will also require changes to the waste load allocations in Appendix B.

Response: The commenter is correct in saying that the waterbodies mentioned do not have a SHELL designation in the Basin Plan, and that the tributary rule does not apply to the ocean. However, all of the waterbodies included in this project eventually discharge to a beach, and all beaches have a SHELL designation. TMDLs are based on numeric targets that protect the most sensitive downstream beneficial use. In order to accomplish this, numeric targets based on WQOs for SHELL must be used. Dischargers will not be held accountable for meeting SHELL WQOs in freshwater creeks.

Comment 135

Section 11.4.1 of the Bacti-1 TMDL incorrectly identifies the "priority" of some creeks. The Bacti-1 applies the water quality standards throughout the watershed. On page 41 the enterococcus standard is listed as 61 most probable number (MPN)/100 milliliters (ml). This standard was taken from the Basin Plan, page 3-6 for a freshwater designed beach. We question the application of freshwater "beach" standards to the rivers and creeks in this TMDL. In the Basin Plan there are also designations for moderately or lightly used areas at 108 MPN/ml or infrequently used areas at 151 MPN/ml. We request the Regional Board revisit the designation of freshwater water quality standards and concern the application of moderately or lightly used areas that is similar to the saltwater standards.

Response: The TMDLs were calculated using numeric targets that were selected from the most conservative WQOs in the Basin Plan and/or Ocean Plan. The Basin Plan does include saltwater and freshwater enterococci single sample maximum objectives for "designated beaches," "moderately or lightly used area," and "infrequently used area." However, the Basin Plan does not provide criteria for assigning these categories to beaches. We must use the most conservative WQOs to protect REC-1 users. Thus, we selected the "designated beaches" WQOs for enterococci. For enterococci, 61 MPN/100 mL is the most conservative water quality objective for freshwater or saltwater. This water quality objective is protective of both freshwater and marine water REC-1 beneficial uses.

The dischargers must provide evidence to justify classifying a beach as a "moderately or lightly used area." If compelling evidence is provided, the "moderately or lightly used

area" enterococci water quality objective could be used as the wet weather numeric target to revise the TMDLs. We calculated enterococci TMDLs using the less stringent numeric target in addition to the stringent numeric targets as described in the response to Comment 129. Therefore, if dischargers provide compelling evidence that the creek usage frequency is at the level of a "moderately to lightly used area," the less stringent enterococci TMDLs can be implemented. This information must be received by the San Diego Water Board prior to the adoption of implementing orders.

Comment 136

The comments and recommendation previously expressed remains unanswered and valid: The single-sample 104 CFU saltwater criterion for Enterococcus should be applied to both beaches and creeks for wet weather. The comments and recommendations under Comment 126 were partially answered with the new Draft's clarification that "total coliform TMDLs must be met only at the bottom of the watershed where creeks and rivers discharge to the Pacific Ocean", and the new provisions for time extensions contingent on shellfishing surveys. One of the 4B recommendations still stands: A moratorium on enforcing Final Total Coliform TMDLs for SHELL should be explicitly stated in the Report, and considerations for enforcement should be deferred until the related beneficial use questions and appropriate WQOs are better resolved State-wide.

Response: Please see the responses to Comments 129 and 130.

Comment 137

On Page B-8 Compliance Schedule: "Full implementation of the TMDLs for indicator bacteria shall be completed within 12 years from the effective date of the Basin Plan amendment in areas where shellfish is known or suspected of occurring, and 17 years in areas where shellfishing is known not to occur……." The City has a concern of implementing a costly compliance program where a particular Beneficial Use is "suspected" of occurring, when this term is so ill-defined. Per a memo to Julie Chan from Christina Arias, subject: Meeting with Department of Fish & Game, dated November 3, 2006 (attached), it appears the although there is documentation of shellfish harvesting in specific areas of San Diego County, there are no observations nor definitive documentation of shellfish harvesting in southern Orange County, within the SDRWQCB region. The City requests that the RWQCB define, clarify and provide documentation of where the shellfish harvesting areas are known or "suspected" so we know the extent of our compliance requirements.

Page 8 of the Technical Report states, "Shellfishing determinations must be made by execution of special studies or surveys." A study of this nature was conducted in Orange County and was extremely costly. The economic analysis does not account for these studies, but it needs to. This report does not identify who is responsible for conducting these studies. Please clarify.

Response: Regardless of whether or not shellfish harvesting is taking place, the fact remains that the entire Pacific Ocean shoreline in the San Diego Region is designated for

the SHELL beneficial use. The WQOs are established in the Basin Plan and Ocean Plan. Please see the response to Comment 130.

Comment 138

With respect to the technical underpinning that has been used for the development of the Project I Bacteria TMDL, our concern is that the selected technical approach for the TMDL could require substantial bacteria loading reduction in the watersheds of interest and expenditure of significant public funds, without commensurate enhancement in beneficial use protection. These concerns apply to both wet and dry seasons.

Response: Beneficial uses are supported when the WQOs are met for those beneficial uses. Any reduction in bacteria loads will improve water quality and restore and/or support beneficial uses.

Under Clean Water Act (CWA) section 303(d), the San Diego Water Board is obligated to develop TMDLs for waters not meeting water quality standards (water quality objectives and the beneficial uses they are designated to protect). TMDL calculations must be based on existing WQOs, and the dischargers must comply with the TMDLs.

The compliance schedule provides the dischargers 10 years to comply with the interim TMDLs, and 20 years to comply with the final TMDLs. Within that time period, the dischargers can implement measures in a phased approach, beginning with the least expensive measures, such as source control. If water quality does not sufficiently improve, additional measures must be implemented until compliance with the TMDLs is achieved. Even if WQOs are relaxed and the necessary load reductions are subsequently reduced, reductions will likely still be required. Given that these waters have been listed for years, strategies to reduce bacteria should begin immediately.

Comment 139

During wet weather, the TMDL is based on estimated bacteria loadings which are proportional to the flow (and thus amount of rainfall). Therefore, those days with the highest flows are disproportionately weighted in the TMDL calculations compared to days with lower flows. These days are also the ones in which the likely level of recreational use is the lowest. In terms of actual use protection, this approach appears to be fundamentally flawed (that is, why do the days in which recreation is least likely count the most, and, is there any science or policy basis for weighting any particular day more than another?).

Response: There is no disproportionate weighting in the TMDL calculations. The numeric targets are fixed. The calculations are proportional to the flow. The more flow there is, the more assimilative capacity is available, thus the more load is allowed in the discharge.

We agree that rainfall events correspond to times of the year when the REC-1 beneficial use is at its minimum. However, beneficial uses apply at all times, and therefore must be protected at all times, regardless of season or hydrological conditions. Despite poor

water quality, or even dangerous oceanographic conditions, REC-1 use is still occurring during wet weather events and the following 72 hours.

Comment 140

The dry weather total coliform numeric targets for beaches are based on the unjustified assertion that the SHELL WQO for total coliform is appropriate for creeks and rivers even though they do not support the SHELL use. The draft report indicates that the SHELL WQOs must be met at the bottom of the watershed where creeks and rivers discharge to the Pacific Ocean (which does have a SHELL designated use). This assumption is faulty, given that the SHELL use is designated for the Shoreline, not the point at which creeks and rivers discharge to the Ocean. Given the low dry weather volume of water discharging from the creeks and rivers (relative to the Pacific Ocean), a prioritized investigation is needed to determine the relative impact of the creeks on the SHELL use on the Shoreline (i.e. if dilution of greater than ~15:1 occurs, the effective WQOs in creeks for the REC-1 use and on the shoreline for the SHELL use would be similar for total coliform).

Response: The commenter is correct that the SHELL beneficial use is designated for the shoreline, not the creeks and rivers. However, there is a location on the shoreline where the creek or river eventually discharges to the ocean. In the watershed models, this is called the critical point. The critical point is a node in the watershed model, and does not necessarily reflect an actual location in the watershed.

The dry weather watershed model assumes an average flow and load for dry weather days, and calculates a TMDL in terms of a monthly load. However, there may not be dry weather discharge to the shoreline every day in a given month. If there is no discharge on a given day, the bacteria loads from the creek or river to the shoreline and ocean would be zero on that day. On dry weather days when the creek or river does discharge to the ocean, there is a bacteria load that is discharged to the shoreline. Conceptually, the sum of the bacteria loads from the creek or river at the shoreline from every day in a given month must be less than or equal to the dry weather TMDL.

The dry weather watershed models included several conservative assumptions to ensure that the beneficial uses of the creeks and beaches are supported. However, if there is a concern that the TMDL is too conservative, the discharger may choose to perform an investigation or special study to determine the relative impact of the creeks on the SHELL beneficial use at the shoreline. If the discharger can provide compelling evidence that the TMDL should include a dilution factor, the TMDLs can be revised to do so. However, until that evidence is provided, the assumptions that are included in the TMDL calculations will result in water quality that supports all beneficial uses designated for the creeks and beaches.

Comment 141

The Water Board may wish to consider revisiting the Beneficial Uses of certain water bodies. Regulations permit the following actions after Uses have been established:

(1) Change the Use (40 CFR 131.10(e)),
(2) Remove the Use (131.10(g)),
(3) Revise the Use (131.10(i)), or
(4) perform a Use Attainability Analysis (UAA, 131.10(j)/(k))

Response: A water quality standards action was evaluated in the environmental analysis (Appendix R, section R.8 Reasonable Alternatives to the Proposed Activity). The San Diego Water Board does not have sufficient evidence that REC-1 and SHELL beneficial uses were inappropriately designated for the beaches, creeks, and San Diego Bay. The appropriateness of any water quality standard (including beneficial uses or water quality objectives) must be addressed as a Basin Planning issue at this time. The Triennial Review process is the most appropriate forum for raising this Basin Planning issue if the dischargers have sufficient evidence that a use was improperly designated.

Comment 142

Section 1.1, Pages 2 & 3, first paragraph; This section of the draft bacteria TMDL states, "*Numeric targets for the TMDL calculations were equal to the WQO's for bacteria for either REC-1 or SHELL beneficial uses. Numeric targets used for beaches were also used for impaired creeks. Although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these waters where they discharge to the Pacific Ocean must be protective of the SHELL use at the shorelines."*

Not all creeks within this Region, Chollas Creek as an example, discharge directly to the Pacific Ocean. Given the above quoted basis for requiring SHELL bacteria limits, creeks and rivers that do not discharge to the Pacific Ocean should not have SHELL (Shellfish harvesting) bacteria limits applied to them. Additionally, some of the creeks and rivers listed in the draft bacterial TMDL do not hold a REC-1 designation use nor are they accessible to the public, i.e. they are restricted waters. Chollas Creek and 7th Street Channel are examples of such creeks.

Using a blanket assumption of REC-1 or SHELL WQOs for the TMDL numeric target is in appropriate. Targets should be developed for the WQOs that the creeks or the nearby receiving waters support.

Response: The commenter is correct that Chollas Creek does not discharge directly into the Pacific Ocean. However, Chollas Creek does discharge into San Diego Bay, which also has been designated with the SHELL beneficial use.

According to the Basin Plan, Chollas Creek is designated as having a REC-1 potential beneficial use. The Clean Water Act (CWA) requires that the TMDLs ensure that water quality supports existing **and** potential uses. The appropriateness of any water quality standard (including beneficial uses and water quality objectives) must be addressed as a Basin Planning issue, not a TMDL issue. The Triennial Review process is the most appropriate forum for raising this Basin Planning issue.

Please see section 4.4 of this appendix, which explains why beaches and creeks were evaluated simultaneously and where WQOs are applicable.

Comment 143

Page 14, last paragraph, Why are SHELL WQOs being applied to areas that are not designated as such in the San Diego Basin plan? Page 15, Table 1-2, Using SHELL bacteria limits for watersheds that do not have shellfish harvesting listed for them in the San Diego Basin Plan is an incorrect use of the designation.

Page 37, Section 4, 4th paragraph, The draft bacteria TMDL states, "In other words, although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these water where they discharge to the Pacific Ocean must be protective of the SHELL use at the shorelines."

Response: Please see section 4.4 of this appendix for additional explanation about where WQOs are applicable.

Comment 144

Page 37, Section 4, 4th paragraph. Chollas Creek is designated a REC-2 beneficial use not a REC-1 and the bacteria TMDL should be set accordingly. Page 44, Table 4-5, "Interim and Final Numeric Dry Weather Targets for Beaches and Creeks"; In the San Diego Basin Plan, Table 2-2 titled "Beneficial Uses of Inland Surface Waters", lists Chollas Creek as a REC-2 (Non-Contact) beneficial use and a potential REC-1 use. However, REC-1 limitations are being applied to the in the draft bacteria TMDL Technical Report. Bacteria TMDL targets should match San Diego Basin Plan beneficial uses. REC-2 bacteria limitations should be applied to Chollas Creek. If in the future the Basin Plan beneficial use for Chollas is changed to REC-1, then those bacteria limitations should be applied.

Response: The Clean Water Act (CWA) requires that the TMDLs ensure that water quality supports existing **and** potential uses, not just existing uses. Thus, using WQOs for REC-1 uses as numeric targets for Chollas Creek TMDLs are appropriate.

Comment 145

Section 4.0 of the Draft TMDL, in establishing numeric bacteria targets, states that: "Although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these waters where they discharge to the Pacific Ocean must be protective of the SHELL use at the shorelines. Thus, the SHELL WQO for total coliform is the appropriate numerical target for the TMDLs for creeks and rivers even though they do not support SHELL use." The City of Laguna Beach does not agree with the establishment of SHELL water quality standards in waters where SHELL is not a beneficial use. The final TMDL should establish bacteria standards in the regulated water bodies based on the beneficial uses designated for those water bodies.

Response: Please see section 4.4 of this appendix for additional explanation about where WQOs are applicable.

Comment 146

Use Attainability Language Is Inappropriate And Should Be Removed From The TMDL

Page 14 of the Draft Technical Report March 9, 2007 seems to contemplate a Use Attainability Analysis for the SHELL standard. This discussion has no place in the TMDL. If staff is proposing that the SHELL designation, or current shellfish harvesting should be a criterion for determining priority waterbodies, this should be more clearly explained. We agree with staff's determination (Draft Technical Report March 9, 2007, page 2) that the total coliform density in beach and creek waterbodies where they discharge to the Pacific Ocean must be protective of the SHELL use at the shorelines. Nothing in the compliance schedule should impact that designation or change the requirements of the UAA should a municipality choose to implement one.

Response: We assume that this comment, which refers to the March 9, 2007 version of the Technical Report, equates the requirement to document the non-existence of shellfish harvesting with the need for a UAA. We are not suggesting that the use be removed; however if shellfish is not occurring, there should be no increased risk to public health by giving dischargers additional time to meet the TMDLs for SHELL uses.

This comment is moot, however, since the referenced language was deleted in the June 22, 2007 version of the report. We expanded the compliance schedule to 20 years for meeting final wet and dry total coliform TMDLs for SHELL because of how stringent these TMDLs are. We intend to revise these TMDLs, and the 20-year compliance schedule after adoption of the reference system/natural sources exclusion approach Basin Plan amendment. This process is described in the response to Comment 2.

5.5 Implementation Plan/Compliance Assessment

Comment 147

Expressing the waste load allocations as number of bacteria of colonies per year (billion MPN/yr) is not a useful metric to measure for compliance with the TMDL. We understand the need to define a load allocation in a concentration per time unit; however, the current allocations set a target that we will never be certain we are meeting. Additionally, deferring the determination of the measurement metric until the revision of the NPDES permits is inappropriate and leaves much uncertainty for the regulated entities. The waste load allocations in the TMDL should be expressed in a metric that is clearly measurable and reportable.

Response: We are not proposing that bacteria loads be used for measuring compliance. However, this metric is usable for expressing WLAs because quantification of loads allows urban runoff program managers to know the magnitude by which WQOs are exceeded. Strategies for reducing bacteria loads will be dependent upon the magnitude of the bacteria loads. For example, a watershed having very frequent exceedances consisting of lower magnitude loads will require different BMPs from watersheds having infrequent exceedances consisting of higher magnitude loads. A metric expressed in a term different from a load, such as exceedance days, does not allow program managers to decipher a percentage by which loads must be reduced, nor help with selection of BMPs. Expressing WLAs as a load per time is consistent with the intent of the TMDL program.

The TMDLs for beaches and creeks are not the first TMDLs where the allocations are expressed as loads. The *Nooksack River Watershed Bacteria TMDL*, developed by the Washington Department of Ecology in 2001, and the *Lynnhaven Bay TMDL Report for Shellfish Areas Listed Due to Bacteria Contamination,* developed by the Virginia Department of Environmental Quality in 2004, both use loads as the method of expressing the allocations. Additionally, the bacteria TMDL for Canyon Lake (San Jacinto watershed), which is under development by the Santa Ana Water Board, also expresses the allocations in terms of loads.

We further disagree that number of bacteria colonies per year is not measurable or reportable. Loads can be calculated by multiplying measured flows (volume/time) by measured bacteria densities (number of bacteria/sample volume). Flow and density measurements can be made at selected monitoring locations at a set frequency, which would be used to estimate an annual average flow and density from which an average annual load estimation could be calculated.

TMDL compliance will not necessarily be measured against the metric used to express WLAs. As described in section 10.2 of the Technical Report, WLAs are the maximum amounts of pollutant that can be contributed to a waterbody by point source discharges of the pollutant in order to attain WQOs. NPDES requirements must include conditions (WQBELs) that are consistent with the assumptions and requirements of the WLAs. *WQBELs may be expressed as numeric effluent limitations or as BMP development, implementation, and revision requirements*. Numeric effluent limitations require monitoring to assess load reductions while non-numeric provisions, such as BMP

programs, require progress reports on BMP implementation and efficacy, and could also require monitoring of the waste stream for conformance with a numeric WLA requiring a mass load reduction. The metric for which WQBELs will be expressed and included in NPDES requirements for urban runoff, (also known as municipal "permits") for the purpose of implementing WLAs, has not been determined at this time. Examples for suitable metrics could include measurements of bacteria loads, bacteria densities, the number of days that WQOs are exceeded, or evidence of an iterative BMP program.

WQBELs will be incorporated into NPDES requirements for urban runoff upon re-issuance or revision of these requirements. WQBELs and other requirements implementing the TMDLs could be incorporated into these NPDES requirements upon the normal renewal cycle or sooner, if appropriate. Reissuence of NPDES requirements is a public process, and the public will have ample opportunity to propose a metric or comment on the proposed metric to be used to measure compliance and details concerning monitoring and reporting requirements.

We agree that, at this time, there is uncertainty for the regulated entities regarding which metric will be used to express WQBELs and measure compliance. However, the public process associated with reissuence of NPDES requirements is the proper forum for establishing this metric.

Comment 148

The text needs to define what will constitute "maintaining" Water Quality Objectives (WQOs). For how long will WQOs need to be met before the water body is considered "maintaining" the objective? Additionally, the text should state that the monitoring plans will likely need to be revised once WQOs are attained. Verification of WQO compliance will most likely be accomplished through a reduced level of monitoring than that necessary to monitor the gradual attainment of WQOs through the implementation of BMPs.

Response: We have modified the text in the Technical Report to clarify the term "maintaining WQOs." WQOs are considered "attained" when the waterbody under consideration can be removed from the List of Water Quality Limited Segments. WQOs are considered "maintained" when, upon subsequent listing cycles, the waterbody has not returned to an impaired condition necessitating re-listing on the List of Water Quality Limited Segments. Attaining and maintaining WQOs will be accomplished by achieving wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources.

We agree that the monitoring plans can likely be revised once WQOs are attained, and that verification of WQO compliance can most likely be accomplished through a reduced level of monitoring. We modified the text of the Technical Report to reflect these changes.

Comment 149

The text needs to clarify the entities which will provide the monitoring results to be used to identify if small MS4s and discharges from nonpoint sources (owners or operators of agriculture, nursery or animal feeding operations) that may contribute to the impairments at the beaches and creeks. The text should include a commitment from the Regional Board to either conduct or require monitoring by third parties to assess the quality discharges from these entities in the vicinity of the impaired waterbodies to identify potential sources of bacteria. Data that confirms bacterial water quality impairments should be used to enroll other participants in the TMDL.

Response: At this point, we are not requiring monitoring results to identify if discharges from small MS4s and controllable nonpoint sources are contributing to impairments at the beaches and creeks. Instead, we are relying first on regulation to eliminate any threats to water quality. Owners and operators of small MS4s in the watersheds subject to this TMDL shall be required to submit Notices of Intent to comply with the requirements of Order No. 2003-0005-DWQ. Order No. 2003-0005-DWQ was issued by the SWRCB and describes General NPDES requirements for the discharge of stormwater from small MS4s. This Order requires the Phase II small MS4 dischargers to develop and implement a Stormwater Management Plan/Program with the goal of reducing the discharge of pollutants to the MEP.

For controllable nonpoint source discharges, we will enforce existing WDRs and enforce the waivers. Specifically, we will enforce facility specific WDRs and waivers with respect to discharges from animal feeding operations, manure composting and soil amendment operations, and agricultural and nursery irrigation return flow in the San Juan, San Luis Rey, San Marcos Creek, and San Dieguito watersheds where loading from these sources is significant. If, upon enforcement of the waivers, nuisance conditions or exceedances of WQOs occur despite the stated conditions, then WDRs will be issued for these discharges.

As a result of these steps, monitoring by third parties to identify potential sources of bacteria may not be necessary. These steps provide a means of curtailing discharges of bacteria, either by implementing stormwater programs or enforcing existing regulatory programs. However, if, after the measures described above are implemented, and sources are still unknown, then we can require monitoring from suspected dischargers in the vicinity of an impaired waterbody. Since it is unknown whether or not such monitoring is necessary, this amount of detail in the Technical Report is not appropriate.

Comment 150

The discussion of special studies needs to address the weaknesses in the model used to develop the TMDL (lack of water quality data, lack of representation of actual bacteria life-cycle processes (die-off, regrowth), lack of flow data, etc.) and outline a series of studies to collect the necessary data to strengthen and verify the model. The Implementation Plan should include a re-evaluation of the TMDL in conjunction with the NDPES permit renewal. The plan should commit to a recalibration and validation of the model using new data collected during program monitoring and special studies and any

new information regarding bacteria fate and transport, indicator/pathogen correlations and epidemiological studies. The re-evaluation should include the TMDL targets, load and wasteload allocations. Achieving the WQOs for bacteria will be an expensive and long-term project for the named dischargers. Accurate targets based on specific data from each watershed are essential for the achievement of the TMDL in a timely and cost-effective manner.

Response: We agree that adding language in the discussion of special studies to address the weaknesses in the model used to develop the TMDL is appropriate and that more data in these areas will result in better computer modeling results. The text of the Technical Report has been modified to reflect these additions.

The models and all associated data used for TMDL development are available for public use. Dischargers are free to utilize the models to determine what kinds of special studies are needed to improve model performance, recognizing that each watershed could be unique in terms of special studies required for model improvement. Dischargers should outline a series of studies for this purpose. One appropriate place to document this information is the Bacteria Load Reduction Plans submitted by Lead Jurisdictions. We will partner with dischargers in this effort to the extent that resources are available.

In terms of reevaluating TMDLs, please see the response to Comment 58.

Comment 151

Determining Compliance with Waste Load Allocations (WLA): As suggested by the SAG, it is not clear how compliance with the WLA will be tracked and measured. The method being proposed is not practical or easily understood. It appears a complicated and costly computer generated modeling and statistical analysis may be needed on a routine basis. We recommend the WLA be simplified and expressed as "allowable exceedance days" that will achieve the required water quality objectives and waste load reductions. This approach was used in both the Malibu Creek and Santa Monica Bay Beaches TMDL Basin Plan amendments.

Response: Costly computer generated modeling and statistical analysis likely won't be needed on a routine basis (to track and measure compliance with the WLAs). We have not proposed a method for determining compliance with TMDLs. Please see the response to Comment 147.

Comment 152

Responsible Jurisdictions: As indicated by SAG, the TMDL document should be reviewed and modified as needed to ensure that dischargers under the Project I TMDL are not responsible for other dischargers water quality violations that lead to exceedances of WQO or WLAs in cases where dischargers are either; 1) under a separate NPDES permit, or 2) outside the dischargers jurisdiction.

Response: The WLAs for municipal dischargers specifically were not subdivided among jurisdictions in order to allow the dischargers some flexibility on how the bacterial loads will be reduced and to allow pollutant load trading between dischargers. We have not

modified the Technical Report in response to this comment because it addresses an enforcement issue that is appropriately addressed if or when there is a violation of an implementing order.

During implementation of the TMDLs, we will review the Bacteria Load Reduction Plans and the results generated in subsequent reports prepared by the dischargers. Subsequent reports should indicate if one municipal discharger in a watershed is not implementing BMPs to address the bacteria problem. For the discharger(s) not contributing appropriately to bacteria load reductions, we can take enforcement actions to bring them into compliance with their requirements.

Comment 153

The Executive Summary discussed "third party agreements" where the Regional Board could conditionally waive regulation of bacteria sources based on the existence of an adequate pollution control program that adequately addresses the sources. The Technical Report does not provide the criteria to be used to determine when such waivers are appropriate. When municipalities are being asked to achieve 100% compliance, and other sources have the ability to opt out of the program, this process should be outlined for all stakeholders to review. We recommend that these sources be required to perform both dry and wet weather monitoring and meet the same Ocean Plan or Basin Plan bacteria standards as the municipalities.

Response: The commenter incorrectly states that nonpoint source dischargers of bacteria can "opt out" of meeting required reductions and instead pursue third party agreements with the San Diego Water Board. Nonpoint source dischargers cannot "opt out" of meeting LAs and required load reductions. For nonpoint sources, regulation will take place primarily by enforcing facility specific WDRs and the Waivers with respect to waivers for dischargers of waste from agricultural and orchard irrigation return flow, animal feeding operations, and manure composting and soil amendment operations in the San Juan Creek, San Luis Rey River, San Marcos Creek, and San Dieguito River watersheds, where controllable nonpoint sources contribute more than 5 percent of the total wet weather bacteria load. Under the Waivers, discharges from controllable nonpoint sources are not allowed to cause nuisance conditions to receiving waters or violations of applicable WQOs. If, upon enforcement of the Waivers, nuisance conditions or exceedances of WQOs occur despite the stated conditions, then facility specific or general WDRs or waivers can be issued to violators.

We will pursue a Third-Party regulatory-based approach only for discharges not otherwise regulated by WDRs or waivers, or where issuing facility specific or general WDRs or waivers are appropriate. Upon enforcement of WDRs, waivers, or third party agreements, we may require dischargers to conduct water quality monitoring.

Comment 154

Table 11-2 - Responsible Municipalities and Lead Jurisdictions –As stated in our June 20, 2006 letter, we suggest that Table 11-2 lead agencies be organized the same as the current MS4 NPDES permits watershed lead agencies. This will be beneficial since watershed

plans needed for MS4 NPDES compliance have already been developed and stakeholder group established.

Response: We agree that Lead Jurisdictions identified in the Technical Report should be consistent with Lead Agencies identified in MS4 requirements. Table 11-2 has been modified accordingly. The text of section 11.3.3 has been modified to allow municipal dischargers to elect a Lead Jurisdiction different from the ones indicated in Table 11-2. Lead Jurisdictions identified in Table 11-2 are default designations in the event that dischargers do not elect one.

Comment 155

Section 11.5 discussed Water Quality Based Effluent Limitations (WQBELs). The first paragraph of this section states *"WQBELs for municipal storm water discharges can be either numeric or non-numeric. Non-numeric WQBELs typically are a program of expanded or better tailored BMPs. The USEPA expects that most WQBELs for NPDES-regulated municipal discharges will be in the form of BMPs, and that numeric limitations will be only used in rare instances. WQBELs can be incorporated into NPDES requirements for MS4 dischargers by reissuing or revising these requirements."* The Technical Report does not explain why the Bacteria 1 TMDL needs to be the exception, i.e,. a numeric limit. This appears to be more stringent than the MEP requirement of the federal Clean Water Act.

Response: Whether or not the WLAs are expressed in NPDES requirements as numeric limitations, or a program of BMPs, will be decided when the NPDES requirements are revised. Considering the variability inherent in bacteria sampling results, expressing the WLAs as a program of BMPs seems prudent. The NPDES requirements require that standards be met in receiving waters. The TMDLs provide a time schedule for achieving that result.

Comment 156

Section 11.5.4 – The City of San Diego is requesting a time line regarding when the Regional Board will contact the Phase II MS4 permittees for inclusion into this TMDL Program. Currently, University of California, San Diego has not been included in this progress. UCSD is located adjacent to the Scripps Areas of Special Biological Significance and should be notified of their requirement to participate, along with other Phase II MS4s that contribute bacteria into these impaired waterbody segments.

Response: We have contacted by phone the small MS4s listed in Appendix Q to make them aware of these TMDLs. Steps to regulate small MS4s will begin after we have initiated steps to regulate Phase I municipal dischargers in accordance with the discussion in section 11.5.3 of the Technical Report.

Comment 157

P. 96, Section 10.3.2: The Regional Board should commit to requiring small MS4 facilities located in impaired watersheds to enroll in the Municipal Phase II MS4 Statewide Order.

Response: We have committed to this action. Section 11.5.4 of the Technical Report states that the San Diego Water Board shall require owners and operators of small MS4s in the watersheds subject to this TMDL to submit Notices of Intent to comply with the requirements of Order No. 2003-0005-DWQ, the General NPDES requirements for the discharge of stormwater from small MS4s.

Comment 158

P. 98, Section 10.4: The Regional Board should commit to verifying through discharge sampling that conditional waivers for runoff from agricultural facilities, orchards, animal feeding operations and soil amendment and composting facilities are not violating waiver conditions.

Response: We have committed to enforcing waiver conditions as a result of these TMDLs, in the San Juan Creek, San Luis Rey, San Marcos Creek, and San Dieguito River watersheds where agricultural and livestock sources are significant. In these watersheds, bacteria loading from controllable nonpoint sources accounts for more than 5 percent of the total wet weather load. Upon enforcement of waivers, we may require nonpoint source dischargers to perform water quality monitoring to verify whether or not waiver conditions are being met. Whether or not such actions will be necessary is not known at this time. Additionally, we are in the process of revising the waivers for agricultural and animal facility operations to make identification of these facilities easier for the San Diego Water Board. Identification of facilities is the first step in enforcing the waivers.

Should water quality data be needed to identify a suspected discharger, we have discretion at any point in time to request this information pursuant to Water Code section 13267.

Comment 159

Table 11-2- Responsible Municipalities and Lead Jurisdictions – The County of San Diego does not have land use jurisdiction in the lower 1 mile of Forrester Creek that is impaired. The County requests that the lead jurisdiction is assigned to a jurisdiction with land use authority in the impaired segment. The County of San Diego is committed to do its fair share in improving the water quality in Forrester Creek and will work cooperatively with the other stakeholders.

Response: Table 11-2 has been modified to identify the City of El Cajon as the lead jurisdiction for the San Diego River hydrologic unit (907.00). This change was made for consistency with the San Diego Water Board Order No. R9-2007-0001, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s), Draining the Watersheds of the County of San Diego, the Incorporated*

Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority.

Comment 160

Section 11.5.1, Process and Schedule for issuing NPDES Requirements. This section should more fully describe this process for several reasons:

- The compliance schedule to achieve the final wasteload reductions is 12 years but NPDES permits are renewed every five years. How will the NPDES permits be managed during this transition period?
- There are differences between the interim and final wet weather WLAs. Will the Board issue interim NPDES permits?
- The municipal discharges in each watershed collectively are required to determine how to divide the allocations of the one WLA for the watershed but that the Board issues the NPDES permits for each point source discharger within the each watershed. This raises a potential conflict issue between the allocations made by the discharges and the WQBELs in each NPDES permit.
- Requirements for new point sources and reallocations of WLAs and WQBELs for existing NPDES permits

Response: The new NPDES requirements for San Diego County and the draft requirements for Orange County municipal dischargers do not include interim WQBELs to implement the bacteria TMDLs. Whether interim and final WQBELs will be added to the requirements mid-cycle, or added during the next renewal, is unknown at this time. Please see the revisions to section 11.5.1 for further clarification.

Comment 161

Expressing the waste load allocations as billions MPN/year is not a useful metric to measure for compliance with the TMDL. The waste load allocations in the TMDL should be expressed in a metric that is clearly measurable and reportable. Despite the SAG consensus, no fundamental change to the wasteload allocation metric was made in the Revised Draft. A change was made to the dry-weather loads to present them monthly rather than annually. Some tinkering with the presentation of wet-weather load reduction percentages occurred, but no basic change of metric approach was incorporated. We fully acknowledge that the wet-weather TMDL calculations represent an impressively complex achievement on the part of your technical consultants as a snapshot of how far we need to go and could be a tool in BMP implementation planning. But from a practical standpoint of measuring progress in the receiving waters, it should be recognized that it is virtually impossible to collect the data needed to track progress in this way. The physical dangers of collecting samples under storm conditions are prohibitive. Given the inherent variability of bacteria measurements (commonly 6 or 7 orders of magnitude) and the huge variation in wet-weather storm flow rates, attempting to extrapolate single-sample daily wet-weather concentration measurements into billions of annual MPN would be

sheer mathematical guesswork and would not serve anyone's interest (with the possible exception of consulting statisticians).

We recognize that the RWQCB is obligated to make TMDL calculations and that considering changes to the fundamental approach at this point in the process would be unacceptably time-consuming. We recommend that **language should be added to the Technical Report clarifying that alternative metrics to determine compliance with the TMDLs may be developed in conjunction with the Compliance Monitoring Plan,** which will be carried out in cooperation with the RWQCB's NPDES permit staff after the TMDL is formally approved.

Response: The Technical Report has been modified to explain that metrics other than "loads" to determine compliance with the TMDLs may be developed in conjunction with the monitoring plan for these TMDLs. Please see the response to Comment 147.

Comment 162

Some acknowledgement should be made in the report regarding just how costly, challenging (and probably infeasible) it will be to achieve actual target or TMDL compliance in some situations. An illustrative case: among the many bacteria-reduction efforts already implemented in the San Juan Hydrologic Unit are three constructed-treatment wetlands built in Laguna Niguel in 2001-2003 in the Aliso Creek watershed to treat dry weather flows from a 0.9-square-mile existing residential subdrainage area. One of the three wetlands (the "West Wetland") was engineered/optimized in acreage size for fecal coliform removal and functioned under a 3-day hydraulic residence time (HRT). The "East Wetland" was oversized relative to the optimum and functioned with a 17-day HRT; while the "North Wetland" was "supersized" with a functioning HRT of about 36 days. All three wetlands actually achieved 95%+ removal of Fecal Coliform, which was sufficient to produce water cleaner than the REC-1 fecal coliform objectives. However, the size-optimized West Wetland was only able to achieve an 80% reduction of Enterococcus, reducing to a geomean concentration of 635 Ent/100 ml; the oversized East Wetland achieved 98% reduction to a geomean of 82 Ent/100 ml; and the "supersized" North Wetland achieved 99.6% reduction to a geomean of 68 Ent/100 ml. But the freshwater geomean WQO for Enterococcus is 33 Ent/100 ml. So despite using up to <u>twelve times as much land</u> as needed to effectively remove fecal coliform and even though (at the "supersized" level) achieving the 99.1% reduction required by the dry-weather TMDL, the wetlands' discharge still doesn't meet the freshwater Ent WQO in dry weather. <u>Why, since EPA's Fecal Coliform and Enterococcus WQOs theoretically represent "equivalent" health risks, is it considered necessary to meet both the FC *and* Ent targets and not just one or the other of them?</u>

Probably the only way to reliably comply with *all* the bacteria WQOs in this drainage is through full technological treatment, such as is occurring at the Salt Creek Ozone Plant. The Salt Creek facility cost $6.7 million to build and runs an annual O&M cost of $230,000 (including $7,300 *per month* just for electricity) - and it only treats dry-weather flows. It is mind-boggling even to contemplate how much land it would take to treat *wet*

weather flows through a treatment wetland, or how huge and expensive a technological-treatment plant would have to be in this already-fully-developed drainage where storm flows can run 10,000 times higher than dry-weather flow rates. Even adjusted to "only" the 27.6% Enterococcus MS4 load reduction required for Aliso Creek in wet weather, what, realistically, would constitute a "feasible means of compliance" to treat a 2,760-fold higher flow rate?

Response: We recognize that dischargers will have a difficult time achieving bacteria WQOs because of the sizeable load reductions needed to do so. For this reason, the compliance schedule is relatively long (20 years, as opposed to most TMDLs which are 10 years) to allow dischargers time to develop effective strategies for reducing anthropogenically-derived bacteria. We realize that natural sources of bacteria can pose an especially difficult challenge, and for this reason, we are developing a reference system approach Basin Plan amendment, as described in the response to Comment 2.

In terms of the fecal coliform/*E. Coli* issue, we are required to develop TMDLs for both because both are indicated in the Basin Plan (we did not develop TMDLs for *E. Coli* due to lack of data). The SWRCB is reviewing WQOs for bacteria for freshwater, which, if different from the current objectives, would replace the objectives in the Basin Plan. The public is encouraged to comment on WQOs development. The CEQA scoping meeting is scheduled for fall, 2007.

Comment 163

Table 11-2. Responsible Municipalities and Lead Jurisdictions; the City of El Cajon does not have land use jurisdiction in the lower 6 miles of San Diego River Lower and at the San Diego River Mouth (a.k.a. Dog Beach) that is impaired. The City requests that the lead jurisdiction be assigned to a jurisdiction with land use authority in the impaired segment. The City of El Cajon is committed to do its fair share in improving the water quality in the San Diego River and will work cooperatively with the other stakeholders.

Response: Although the City of El Cajon does not have land use jurisdiction in either the lower reaches of the San Diego River or Forrester Creek, the City of El Cajon is responsible for reducing bacteria loads to both waterbodies. We are leaving the City of El Cajon as the Lead Jurisdiction for the San Diego Hydrologic Unit (containing both the San Diego River and Forrester Creek) to be consistent with San Diego Water Board Order Number 2007-0001.

The Technical Report clearly states that the role of Lead Jurisdiction is negotiable and that dischargers within the watersheds are free to elect a more suitable Lead without the oversight of the San Diego Water Board. The City of El Cajon should consult with the other municipal dischargers in the watershed to see if a different municipality would be willing to assume the Lead Jurisdiction role.

Comment 164

Table 11-2. Responsible Municipalities and Lead Jurisdictions; the City of El Cajon does not have land use jurisdiction in the lower 1 mile of Forrester Creek that is impaired. The

City requests that the lead jurisdiction be assigned to a jurisdiction with land use authority in the impaired segment. The City of El Cajon is committed to do its fair share in improving the water quality in Forrester Creek within its jurisdiction and will work cooperatively with the other stakeholders.

Response: Please see the response to Comment 163.

Comment 165

The Owner/operators of small MS4s listed in Appendix Q should be named individually in Table 11.2.

Response: To list the numerous owners and operators in Table 11.2 is not necessary, as they are clearly described in Appendix Q. The entities noted in Appendix Q may or may not be exhaustive of all the owners and operators of small MS4s in the San Diego Region. As we become aware of more owners and operators of small MS4s in the Region, they can be added to Appendix Q appropriately.

Comment 166

The City of San Diego is concerned about language in the TMDL which addresses "attaining" and "maintaining" 303(d) list status. Section 1.6 clearly defines what attainment is; however, it states that "WQOs are considered "maintained" when, upon subsequent listing cycles, the waterbody is not returned to an impaired condition via re-listing on the 303(d) list. This requirement does not clearly state the number of 3-year listing cycles it takes to meet the monitoring requirements of the subsequent listing cycles. This ruling is arbitrary and needs to be clearly defined. Additionally, this section uses 40 CFR Section 131.38 as justification for this requirement. This section is titled "Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" and is for "*toxic*" pollutants. The three indicator bacteria are not included in any of the tables or lists in Section 131.38. In fact, this new requirement also appears to be in conflict with the State Water Resources Control Board (State Board) Resolution 2005-0050, Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options. This State Board policy indicates that when listed waters which attain standards are to be delisted. There are no additional actions required. The City of San Diego is requesting the removal of the first paragraph in Section 1.6 based upon the review of both the cited 40 CFR section and the State Board policy. The Regional Board should prepare a new, separate TMDL if a water body is de-listed and then subsequently returned to impaired status.

Response: The language to which the commenter refers is not a requirement or ruling. The Technical Report clearly states that attaining and maintaining WQOs are *goals* of the Implementation Plan. We did not cite the CFR because we did not consult the CFR when writing this language. As attaining WQOs are fundamental goals of the TMDLs and Implementation Plan, this language does not trump the State Board's policy indicating when waterbodies have reached appropriate status for removal from the List of Water Quality Limited Segments.

Comment 167

Section 11.5.6 requires the named entities to investigate landfills as potential bacteria sources. The section states that 47of these landfills are currently regulated by the Regional Board by WDRs or by the General Industrial Storm Water Permit. This requirement is duplicative and is not required by the Clean Water Act or the MS4 permit requirements. The City of San Diego strongly recommends that this section require Regional Board oversight of landfills.

Response: Municipalities are responsible for runoff and associated bacteria discharged from landfills on multiple levels. As the owners and/or operators of landfills, they are responsible for their landfill discharges. Landfills also discharge to the municipalities' municipal separate storm sewer systems (MS4s), at which point the municipalities accept responsibility for the landfill discharges. In addition, Order No. 2007-0001 and Tentative Order 2007-0002 require that source identification, best management practice (BMP) designation and implementation, and inspections be applied to municipal and private landfills. Moreover, landfills are subject to municipalities' local ordinances.

The fact that landfills are regulated by the San Diego Water Board does not negate municipalities' responsibility for runoff from landfills. Responsibility for discharges remains with the discharger, whether the discharger is a landfill owner or an MS4 owner receiving and discharging landfill runoff. Since municipalities are responsible for runoff discharges from landfills, it is appropriate that they be aware of whether or not each landfill is a source of bacteria. As such, municipalities must investigate landfills as potential bacteria sources. However, it is worth noting that municipalities have discretion regarding the scope of investigations to be conducted.

Comment 168

The City of San Diego requests the inclusion of a Re-Evaluation clause with dates. This will provide an opportunity to analyze new land use data, new monitoring data and new scientific technologies under development by EPA and SCCWRP. The inclusion of dates will provide named entities motivation to participate in special studies so they can be included in the re-evaluation process.

Response: Please see the response to Comment 58.

Comment 169

The City of San Diego requests that the Regional Board assess compliance with their existing agricultural waivers and take actions as required. This action requires the review and evaluation of existing data submitted to the Regional Board, assessing the data, finding data gaps, inspect facilities as necessary, and initiate enforcement actions when required.

Response: The San Diego Water Board is in the process of revising the Agricultural/ Nursery/Animal Facility waivers to make it easier to identify these dischargers, and assess and enforce compliance with these waivers. Mo Lahsaiezadeh of the SAG is on

the Advisory Committee for these waivers representing municipal dischargers. Draft waivers will be available for review in July, 2007.

Comment 170

The TMDL should be drafted as a Phased TMDL with a set date for re-evaluation of the numeric model utilizing additional data collected since 2002, further developments in the understanding of bacteria fate and transport and the human health risks from non-human sewage contaminated urban runoff. The reasons for this are as follows:

a) The August 2, 2006 EPA Memorandum regarding "Clarification Regarding "Phased" Total Maximum Daily Loads" states, "the (TMDL) Guidance recommends the phased approach for situations where available data only allow for "estimates" of necessary load reductions for "non-traditional problems" where predictive tools may not be adequate to characterize the problem with a sufficient level of certainty.[19]" This approach clearly applies to this TMDL for the following reasons:

   i) The TMDL is based on limited data. An examination of Appendix G Data Sources illustrates the limited data sets used in the modeling. In many watersheds only a few data points were used and no actual measured flow data was incorporated. Flow data, a key component in the calculation of bacteria loading, is limited at all sites and model-generated values need to be verified with actual field measurements. The modeling for Aliso Creek utilized the largest data set, yet was based on less than 2 years of bacteria concentration data, while at the time of the original modeling analysis, approximately 4 years of data had been reported to the Regional Board under the Aliso Creek CWC §13225 Directive. Data collection in many watersheds has continued through the development of the TMDL document and has not been incorporated into the modeling analysis.

   ii) Bacteria are a non-conservative pollutant with natural sources which are currently indistinguishable from human sources. Additionally, bacteria can reproduce in the environment, while the pathogens that bacteria serve as the indicator for cannot reproduce outside of a host. This leads to a situation where bacteria measurements, in areas not impacted by human sources of bacteria and pathogens, will not truly reflect the health risk from human pathogens. This situation is not currently reflected in the TMDL.

   iii) Recent studies indicate that the major assumption underlying the model used to develop the TMDL (i.e. the assumption that loadings of bacteria from specific land uses are predictive) is flawed. Researchers from University of California at Irvine have found "…distributed

[19] USEPA, 1991. Guidance for Water Quality-based Decisions: The TMDL Process, EPA440-4-91-001 http://www.epa.gov/OWOW/tmdl/decisions/ (page 22)

watershed models of pollutant transport in surface water can be used to define relationships between land use, water quality and stormwater runoff. However, application of distributed models to fecal indicator bacteria and fecal indicator viruses is complicated by the fact that once microbial indicators enter the environment, their fate and transport are likely to be affected by poorly characterized ecological processes, such as the proliferation of environmentally adapted strains of fecal indicator bacteria. Consequently, fecal indicator bacteria and viruses are unlikely to accumulate and wash off in at reproducible and land-use specific rates - an assumption inherent in most distributed watershed models.[20]" Additionally, most assumptions utilized in the model have not been verified nor analyzed for sensitivity to data changes (see Technical Issues comment #1, February 2, 2006 Letter).

Similarly, during the February, 2006 Board Meeting, Regional Board Member Johnson directed staff to address the comments submitted by the Sierra Club and County of Orange regarding modeling and modeling assumptions. (February 8, 2006 Regional Board Meeting Transcript, 154)

iv) The relationship between bacteria levels in waters not impacted by human sewage inputs and human health risk is currently unknown. Recent studies in Mission Bay indicated no link between the illnesses and bacteria levels. A similar study will begin this summer at Doheny Beach in Dana Point. The combined results of both of these studies should be evaluated and incorporated into the TMDL.

b) A re-evaluation of the model is necessary for accurate and verifiable TMDL targets, which are essential to ensuring the most timely and cost-effective implementation of Best Management Practices (BMPs) to address bacteria loads. As illustrated by Section 13 of the TMDL, bacteria control BMPs are extremely expensive to construct and maintain. Additionally, for many of the suggested structural controls (vegetated buffer strips, bioretention, sand filters and infiltration trenches), opportunities for implementation are limited due to the amount of current development in the impacted watersheds and the limited land area for retrofit projects. As such, of the recommended options, diversion and treatment of Municipal Separate Storm Sewer System (MS4) is the most applicable to the affected areas. However, this treatment option is limited not only by the high cost of diversion structure construction, but by limited treatment capacity of area wastewater treatment facilities and by restrictions on salt levels with respect to reclaimed water production. In order to utilize this treatment option, separate or additional treatment plant processes may have to be constructed, the cost of which has not been

[20] Surbeck et al, "Flow Fingerprinting Fecal Pollution and Suspended Solids in Stormwater Runoff from an Urban Coastal Watershed". Environ. Sci. and Technol. **2006** *40* 4435-4441

included in the Economic Analysis in Section 13. TMDL targets should be re-evaluated after the collection of necessary baseline data and epidemiological studies to ensure that appropriate and cost-effective BMP measures are employed.

c) A set date for TMDL re-evaluation is necessary to ensure it occurs and will also serve to coordinate research activities among all watersheds. Setting a re-evaluation date will provide the necessary schedule coordination for activities conducted within each watershed, allowing for the entire TMDL to be re-evaluated at one time. Without a set date, requests for re-evaluation of new data and information will come forward on a watershed-by-watershed basis requiring more Regional Board staff time and effort. Additionally, the re-evaluation date could be set to coincide with the re-calculation of exceedence frequencies and load allocations for San Diego Region reference systems already proposed by Regional Board staff in relation to the proposed Reference Watershed Approach for Implementing Bacteria Water Quality Objectives Basin Plan amendment.

d) The commitment by the Regional Board to a timely re-evaluation of the TMDL will provide assurances to the regulated community of the Regional Board's dedication to accurate and up-to-date regulatory requirements. Just as the named discharges are being asked to budget staff time and resources to address this issue in a timely and structured manner, we are asking the Regional Board to do the same in committing to a re-evaluation schedule.

   Regional Board Member Wright expressed support at the February 8, 2006 Board Meeting for a set re-evaluation timeline for the TMDL model. He stated, "…I'd feel a lot more comfortable if we had built into this whole process some kind of steps along the way where we would review the models. Models have a way of just becoming accepted and becoming engrained in the way we operate." (February 8, 2006 Regional Board Meeting Transcript, 138-139)

Response: Several stakeholders have expressed opinion that there is a need to reevaluate TMDLs at a set date in the future to ensure that the most up-to-date, accurate information is used for model output, and ultimately, TMDL calculation. The commenter cites numerous arguments in support of this position, such as the fact that the model is based on little data; bacteria are a non-conservative pollutant and are often naturally-occurring; bacteria loading cannot always be correlated to land uses with good results; and the relationship between bacteria levels and the human health risk is less understood in waters where no sewage contamination is present. The commenter also states that re-evaluation of the models used for TMDL calculation is necessary for accurate analysis and that a set date for TMDL re-evaluation is necessary to ensure it will occur, and that in doing so, dischargers can coordinate research activities needed for model enhancement.

We agree that the models produce the most accurate results when the latest and best information is utilized, that the commenter raises valid points concerning shortcomings of the models and in the TMDL process. However, attempts to restore water quality and meeting the TMDLs as calculated must not be delayed for acquisition of new information. Even as new information is being sought, attempts to decrease existing bacteria levels must take place, since bacteria contamination is indicative of a public health risk. Available information indicates that high bacteria densities have persisted in the beaches and creeks included in this project, further, we have no information showing that sewage, human wastes, and domesticated animal wastes have been removed from nuisance flows and storm water runoff in any of the watersheds. Even if new data and information are obtained that result in more accurate model and TMDL results, chances are that significant load reductions would still have to take place. As the waterbodies included in this project have been on the List of Water Quality Limited Segments for years, there is no reason why dischargers cannot begin or continue with attaining load reductions immediately.

Please see the response to Comment 58 for further discussion of this issue.

Comment 171

Section 11 Implementation Plan: It should be clarified in the TMDL that the compliance schedule applies to Phase II MS4 dischargers and persons responsible for controllable non-point source (NPS) discharges. As such, the Regional Board should commit to a time schedule for pursuing regulatory controls for all sources of bacteria identified in the TMDL: Phase II MS4 systems, individual landowners with controllable NPS discharges such as nurseries, dairies, horse ranches, septic systems and manure composting operations.

Response: The Technical Report clearly states in Table 11-2 that owners and operators of small MS4s (Phase II) are considered responsible municipalities. Section 11.2, Implementation Plan Objectives, outlines specific actions we will pursue in executing these TMDLs. We will reissue or revise the various existing statewide and regional NPDES requirements that regulate urban runoff and other point source discharges to beaches and creeks addressed in this project, including small MS4s. We will also enforce the Waiver Policy, which will address nonpoint, but controllable sources. We have not committed to a specific timeframe to accomplish these tasks as they must be prioritized with other Board projects.

Comment 172

Section 11 Implementation Plan: Clarification of the requirements of the monitoring in Bacteria Load Reduction Plans is necessary for the following items:

a) Provide information showing whether or not wasteload reductions are being met. As previously discussed (see SAG consensus point #1) the mechanism for computing compliance with wasteload reductions expressed as million billion MPN/year is unknown. As shown by Graph 1, bacteria water quality data is extremely variable. For example, two samples taken side-by-side at the same

time can result in widely varying results. Similarly, flow rates within many urban creeks vary significantly on an hourly and sub-hourly basis. Accurately computing the bacteria load and any wasteload reduction is much more complicated than simply multiplying a single concentration value by an instantaneous flow rate. Further, utilizing the TMDL model for such characterization would be beyond the capabilities of most municipal dischargers, requiring expert support from consultants knowledgeable in model configuration and with the computer capabilities to manage the process.

Chairman Minan requested staff provide "…the support for why that approach (expressing wasteload reductions as million billion MPN/year) is better than the approach taken with respect to Santa Monica Bay. And this is a point that the SAG group raised. So I think you are going to need to do some additional work in that area." (February 8, 2006 Regional Board Meeting Transcript, 52)

b) Locate anthropogenic hot spots and identify and characterize anthropogenic bacteria sources. Reliable scientific methods for differentiating between human and non-human sources of bacteria do not currently exist. It is unclear how dischargers will be able to determine whether bacteria originate from anthropogenic or natural sources.

Response (a): We do not agree that the specificity discussed in this comment is necessary to incorporate into the Technical Report. First, although TMDLs are expressed as "loads" in Tables 9-1 through 9-12, this does not imply that compliance will necessarily be measured in this metric. Second, the manner in which WQBELs are expressed (which must be consistent with WLAs), will be determined upon revision or reissuance of the NPDES requirements for urban runoff. The public process associated with reissuance of the NPDES requirements is the proper place to propose alternative metrics to measure compliance. Please see the response to Comment 147 for further discussion.

Response (b): In order to comply with the stated condition, dischargers do not necessarily have to differentiate between human and non-human sources of bacteria (we assume that the comment implies the use of DNA or other molecular-based approach). More appropriately, dischargers should differentiate between anthropogenic and non-anthropogenic sources of bacteria. For example, dischargers can check suspect bacteria hotspots for upstream cross-connections between sewer and storm drain lines. Additionally, evidence of pet waste, lawn over-fertilization, or trash, are sources of bacteria that we consider anthropogenically-derived, and therefore controllable.

We cannot clarify how compliance will take into account natural sources of pollutants, because these details are not necessary at this stage, and are more appropriately discussed upon re-issuance of NPDES requirements. Dischargers should propose both compliance methods and assessment locations in their Bacteria Load Reduction Plans, which will be unique to each watershed.

Comment 173

In our previous comment letters we have expressed concerns about 1) the technical underpinning that has been used for the development of the Project I Bacteria TMDL, and 2) various policy-level implications associated with the TMDL as proposed. Former Board Chairman Minan clearly appreciated these concerns, as he requested staff to provide "the support for why that approach (expressing wasteload reductions as million MPN/year) is better than the approach taken with respect to Santa Monica Bay" (February 8, 2006 Regional Board meeting).

Response: Please see the response to Comment 147.

Comment 174

The City of Del Mar should not be listed as a responsible municipality in Table 11-2 Responsible Municipalities and Lead Jurisdictions

Miramar Reservoir

The City of Del Mar has drainage from only 150 acres or four tenths of one percent of the Miramar Reservoir Hydrologic SubArea as shown in Figure 1 (Attachment A). The Draft Technical Report names the bacteria-impaired water quality limited segments (Table 3-1) in this watershed as the Pacific Ocean Shoreline for the Miramar Reservoir HA (part of Los Peñasquitos).

Del Mar acknowledges it will have a role in the continued monitoring and assessment of the Anderson Canyon storm drain outfall and will collaborate with watershed dischargers, including the North County Transit District, as part of the bacteria TMDL process. Del Mar anticipates a level of effort comparable to the limited geographical contribution to the watershed and does not believe it is appropriate to be named as the "responsible municipality" in charge of reporting and submittals on behalf of the Miramar Reservoir HA dischargers which includes much larger jurisdictions with more at stake in the program. Del Mar requests that an alternative "default" Responsible Municipality be named in the Draft Technical Report in Table 11-2 – Responsible Municipalities and Lead Jurisdictions; either Poway or the City of San Diego would be equally appropriate.

A similar request has been granted on comparable grounds in the past and Del Mar is no longer listed as the Lead Copermittee for the Los Peñasquitos Watershed in the Municipal Separate Storm Sewer System NPDES Permit or Tentative Order No. R9-2006-0011 (see Table 4 in the order).

Response: We agree that the default Lead Jurisdictions described in Table 11-2 should be consistent with the Lead Copermittees described in Order No. 2007-0001, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District, and the San Diego County Regional Airport Authority.*. Therefore the Lead Copermittee for the Miramar Reservoir hydrologic area will be changed to the City of Poway in the Technical Report.

Comment 175

Del Mar requests that Torrey Pines State Beach at Del Mar (Anderson Canyon) be removed from the Bacteria TMDL Project I

The water quality impaired or 303(d) listing from 1998 is the basis for the beach segments included in this Bacterial TMDL. The listing was last approved by EPA in July 2003 but was not updated to reflect new data and information. The most recent coastal water quality data collected by Del Mar and other stormwater program copermittees to comply with the Coastal Outfall Monitoring Program in Order No. 2001-01 has not been taken into account. The data has been reported annually as part of the reporting and monitoring program requirements, most recently in the *San Diego County Municipal Copermittees 2004-05 Urban Runoff Monitoring Final Report (December 2005).* The coastal outfall monitoring program includes hundreds of samples of the receiving water tested for total coliform, fecal coliform and enterococci **that clearly demonstrate that water quality for various segments of the Pacific Ocean shoreline are not bacteria-impaired**. It is Del Mar's opinion that the listings in San Diego County, including the Torrey Pines State Beach at Del Mar (Anderson Canyon), should be reassessed using data collected and reported from April 1, 2003 through August 15, 2006. The data includes 165 samples tested for all three bacterial indicators and shows attainment of water quality during this time period (see Attachment B). We request that the Regional Board initiate delisting of Anderson Canyon by applying the guidance in State Water Resources Control Board Resolution No. 2005-0050 as described in Section I.A:

> **"If the water body is neither impaired nor threatened, the appropriate regulatory response is to delist the water body.**
>
> The first step in addressing a listing is to identify the scope of the problem. In some cases, this analysis will lead to a conclusion that standards are in fact being attained and the water is not threatened, either because the assumptions underlying the listing were incorrect, or because the impairment has been corrected. In such circumstances, it is appropriate to delist the water body in accordance with the "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List."

If the implementation of the Bacteria TMDL Project I continues as described in the Draft Technical Report and the existing data is not fully considered, valuable municipal and state resources will be spent on a project that will not provide a benefit to water quality comparable to the expenditures.

Response: Even though recent measurements show that the Del Mar beach at Anderson Canyon meets WQOs (at least during dry weather), this and other improved sites will remain included in this project. Whether or not these beach segments meet WQOs during storm events is unclear, since the data submitted for de-listing purposes consisted strictly of dry weather samples. In a letter to the SWRCB dated January 31, 2006, the San Diego Water Board recommended that all waterbodies, regardless of quality during dry weather, remain listed if no wet weather data is available to demonstrate support of beneficial uses. Furthermore, whether or not the SHELL use is supported is also unclear, since the data used for de-listing was not evaluated using the total coliform SHELL WQO.

Although dry weather bacteria load reduction plans would not be required for the watersheds draining to these beaches and any beaches meeting WQOs, BMPs implemented in these watersheds to reduce bacteria loading should be maintained, and monitoring, even if on an infrequent basis to assess the effectiveness of the BMPs, should continue. Wet weather bacteria load reduction plans are still needed, unless dischargers can demonstrate attainment of uses in wet weather. Dischargers can discuss the possibility of a reduced level of monitoring and reporting at sites such as Anderson Canyon with San Diego Water Board staff who oversee the TMDL implementation. TMDL implementation will take place primarily by incorporation of WQBELs into WDRs for urban runoff (such as Order No. 2007-0001). The process is described in section 11.5.3 in the Technical Report.

Comment 176

The Report should clearly establish a commitment to re-evaluate and recalculate the TMDLs on a five-year schedule. This is supported by the following:

i. Limited data from 2002 were used to calibrate the model and substantially more data will be available

ii. Land use data from 2000 was used to calibrate the model and needs to be updated to fairly develop the wet weather allocations to dischargers

iii. Southern California Coastal Water Research project and others are conducting research studies that will further our understanding of background loads and the linkage between indicator bacteria and human pathogens. The results of these studies expected in two to three years should be used to further improve the TMDL analysis.

iv. Based on the results of the year five re-evaluation, the mandatory compliance benchmarks contained in Table 1-2 also will need to modified accordingly.

Response: Please see response to Comment 58.

Comment 177

One reason why it is important to consider more appropriate pollutant loads at this point in time is that anti-backsliding provisions in the Clean Water Act will not allow the Regional Board to increase the Waste Load Allocations (WLAs) associated with these TMDLs once the TMDLs are incorporated into the San Diego Municipal Storm Water permit. Even if the standards can be relaxed after they are incorporated into the Storm Water permit, the City will have already taken expensive activities to comply with the TMDLs as proposed prior to relaxation of the standards.

Response: The San Diego Water Board can increase the WLA after the TMDLs are incorporated into the San Diego Municipal stormwater requirements as a result of new site specific objectives, a change to beneficial uses, or a refinement of the TMDLs based on new data. NPDES regulations [40 CFR section 122.44(l)(1)] prevent backsliding unless the circumstance upon which the previous permit was based have materially and

substantially changed since the time the permit was issued. New site specific objectives, a change to beneficial uses, or a refinement of the TMDL based on new information would qualify as a material and substantial change of circumstance.

Comment 178

The San Diego Municipal Storm Water permit prohibits using Waters of the State to convey or treat storm water. The Bacti-1 TMDL indicates that WLAs must be met prior to discharge of storm water into receiving waters. Given San Diego's topography and existing storm water conveyance system design, Waters of the State/receiving waters generally occur immediately below (downstream of) storm drain outfalls. Therefore, treatment facilities must be located above (upstream of) storm drain outfalls. Moreover, given the propensity for bacteria to breed in the storm drain conveyance system, treatment facilities must be located as close to storm drain outfalls as possible, as the bacteria that regrows in storm drains is considered to be anthropogenic and subject to the zero WLA. Most land above storm drain outfalls is developed with private land uses and these land uses would be displaced by the construction of treatment facilities.

The environmental analysis for both TMDLs states that the construction of treatment BMPs has the potential to displace crops, native biota, and existing land uses but suggests that these impacts can be avoided or minimized by locating treatment BMPs where these things are not present. However, all evidence presented dictates that compliance via treatment requires treatment facilities to be located close to and upstream of storm drain outfalls. Even if treatment facilities are built underground, structures cannot be re-built on top of them. Instead of indicating where treatment BMPs should not be located, the City suggests that the environmental analyses focus on where treatment BMPs may reasonably be located and evaluate the impacts of building treatment BMPs at those locations.

Response: The CEQA requires the San Diego Water Board to consider a reasonable range of specific sites in its analysis, but does not require us to speculate on the specific locations where the dischargers may or may not choose to build BMPs. However, in evaluating potential impacts of BMPs, we considered what those impacts might be in all land use types present in the watershed. We disagree that structures cannot be built on top of underground detention basins. Please see the response to Comment 233.

Comment 179

Please clarify where compliance would be measured for both TMDLs. How would an evaluation of compliance take into account pollutants such as feral animal excrement and aerially-deposited metals that are allowed into receiving waters downstream of storm drain outlets?

Response: We cannot clarify where TMDL compliance will be measured, or how compliance will take into account natural sources of pollutants, because these details are not necessary at this stage, and are more appropriately discussed upon re-issuance of NPDES requirements. Dischargers should propose both compliance methods and

assessment locations in their Bacteria Load Reduction Plans, which will be unique to each watershed.

Comment 180

Is it possible to increase the WLAs for either TMDL (i.e., as a result of new Site Specific Objectives, change to beneficial uses, results of implementing a tiered approach, completion of the bacteria reference study) after the TMDL is incorporated into the San Diego Municipal permit?

Response: Yes it is possible to increase WLAs after the WQBELs have been incorporated into the NPDES requirements.

Comment 181

When is it anticipated that the TMDLs will be incorporated into the San Diego Municipal permit?

Response: The TMDLs must undergo a series of approvals before they can be incorporated into Order No. R9-2007-0001. The TMDLs must be adopted by the San Diego Water Board, followed by the State Water Resources Control Board, Office of Administrative Law, and USEPA. The approvals following the adoption by the San Diego Water Board typically take 6 to 12 months. Incorporation of TMDLs into the NPDES requirements will take place upon the normal 5-year renewal cycle, or sooner, if appropriate.

Comment 182

The City requests that both TMDLs include a re-evaluation provision so that the need for the final WLAs can be formally re-evaluated after non-structural and less-intensive BMPs are evaluated for their maximum effectiveness.

Response: Please see the response to Comment 58.

Comment 183

The City is requesting that San Diego State University and any other universities and colleges be notified to participate in these TMDLs and the Phase II Municipal Storm Water Permit program.

Response: Please see the response to Comments 156 and 157.

Comment 184

For the bacterial TMDL, please clarify whether the final Waste Load Allocation for all anthropogenic indicator bacteria is zero.

Response: Yes, the final wet weather WLAs for anthropogenic sources of bacteria are zero. The WLAs will be revised when the final TMDLs are revised pursuant to either the reference system or natural sources exclusion approach.

Comment 185

For the bacterial TMDL, please clarify whether bacteria from feral dogs and cats, potable water (up to 2 MPN/100 ml) that could be used to maintain wetland vegetation after diverting dry weather flows, and re-growth in storm drains would be considered anthropogenic sources.

Response: Feral dogs and cats could be considered anthropogenic sources. Because domestic or feral animals are, or can be in contact with humans, they are capable of spreading pathogens to humans, and feral dog and cat populations can be controlled. Therefore loads from these sources should be reduced. Potable water used to maintain wetlands is not considered a source of bacteria. If human pathogens do not regrow in storm drains, then this regrowth could be considered non-anthropogenic. Information on whether or not human pathogens regrow in storm drains is not conclusive.

Comment 186

If future monitoring were to find that that bacteria concentrations are in excess of the TMDL limits, please clarify how it would be determined whether the exceedence is or is not due to anthropogenic bacteria. Would the City be required to conduct DNA testing to prove that anthropogenic bacteria are not the cause of the exceedence? We are not aware of many laboratory facilities that can conduct this type of testing.

Response: Please see the response to Comment 172 b).

Comment 187

On page 10, the Bacteria TMDL lists the municipalities and Caltrans that are in the Chollas Creek Watershed. The City requests that the US Navy be included in this TMDL.

Response: The US Navy is a small MS4, therefore they are responsible for meeting TMDL requirements where its facilities are located in impaired watersheds.

Comment 188

The City is concerned why we have to investigate bacteria loads from Regional Board regulated landfills when these facilities already have WDRs. The City is requesting that draft report removed those landfills with existing WDRs from this TMDL because those facilities are regulated directly by the Regional Board.

Response: Please see the response to Comment 167.

Comment 189

The SAG consensus points in Prior Comments both remain unanswered and valid, as does the recommendation: The Technical Report should clearly establish a commitment to re-evaluate and re-calculate the TMDLs on a five-year schedule.

Response: Please see the response to Comment 58.

Comment 190

The last paragraph of Section 11.5.3 indicates that dischargers to certain beach segments that were being de-listed in 2006 would not be required to prepare Bacteria Load Reduction Plans. There are a significant number of other beaches that were proposed for de-listing in 2006 but were not considered for it due to technicalities not related to actual water quality; these beaches (and perhaps some additional ones) are expected to be re-nominated and successfully de-listed in 2008. The Bacteria Load Reduction Plans are not scheduled to be completed until 2009. The second sentence in this paragraph should be modified as follows:

> *For those beach segments de-listed in 2006, or other beach or creek segments removed from the 303(d) list prior to the scheduled completion date for its respective Bacteria Load Reduction Plan, municipal dischargers and Caltrans need not prepare Bacteria Load Reduction Plans for their discharges in these watersheds.*

Response: We have revised the indicated language in the Technical Report, but we did not use the suggested language in this comment. Because the beaches that were de-listed in 2006 were not evaluated against the SHELL total coliform WQO, whether or not the SHELL beneficial use is supported is unknown. Furthermore, the data used for de-listing purposes was confined to dry weather conditions. This indicates that several municipalities have been effective at implementing dry weather BMPs. Therefore, Bacteria Load Reduction Plans are still needed in all watersheds for wet weather, unless dischargers demonstrate that uses are attained in wet weather.

Comment 191

Section 11.5.6 indicates that active Municipal Solid Waste Landfills should be investigated to determine if they are potential sources of bacteria, but the Section does not explain who is supposed to be performing these investigations. Since these facilities are separately permitted, this would seem to be an appropriate task for the RWQCB.

Response: Please see the response to Comment 167.

Comment 192

Del Mar requests that Torrey Pines State Beach at Del Mar (Anderson Canyon) be removed from the Bacteria TMDL Project I

The most recent water quality impaired list or 303(d) listing, dated October 25, 2006, should be the basis for including the beach segments in this Bacterial TMDL project. The listing was last approved by the State Water Resources Control Board to reflect new data and information in accordance with the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy). The fact sheet for the Pacific Ocean Shoreline at Miramar Reservoir HA (Attachment A) recommended the delisting of the segment using the weight of evidence and in compliance with the Listing Policy. Del Mar asserts that the Bacteria TMDL Project I Draft Technical Report must be amended to show this segment has been removed and no longer requires a TMDL. This

action is necessary in order to provide consistency and clear priorities, for both the RWQCB and dischargers, in the development and implementation of TMDLs.

Response: Please see the response to Comment 175.

Comment 193

Del Mar requests that Table 1-1. Bacteria-Impaired Water Quality Limited Segments Addressed in this Analysis be modified.

Table 1-1 Bacteria-Impaired Water Quality Limited Segments Addressed in this Analysis should be modified and the segment for Miramar Reservoir HA removed to reflect the delisting of this area as of October 25, 2006 and to make it consistent with the Listing Policy.

Response: Please see the response to Comment 175.

Comment 194

Del Mar requests removal from the obligation to prepare a Bacteria Load Reduction Plan and comply with reporting requirements.

Removing the Miramar Reservoir at Anderson Canyon segment from the Bacteria TMDL Project I effectively eliminates the requirement to develop and implement the Bacteria Load Reduction Plan required per Section 1.6 of the Technical Report. Del Mar believes that the language in Section 1.6 is too vague and may require unnecessary plans and reports for a water segment that has been delisted by the SWRCB and approved by EPA. Removing the segment from the TMDL project effectively eliminates the City's (and other parties) obligation to comply with these requirements. Limiting this project to the 303(d) listings complies with the State's policies and allows the City to focus resources on high priority water impairments and future TMDLs, rather than on a segment that has effectively shown attainment with water quality objectives.

Response: TMDLs for beaches that have been de-listed in the section 303(d) process ensures that dischargers continue to implement BMPs to meet WQOs. We agree that dischargers should focus their resources on problematic areas, therefore areas meeting WQOs can be considered low priority and a reduced level of monitoring can suffice. Bacteria Load Reduction Plans for wet weather are still needed as described in the response to Comment 175.

Comment 195

Del Mar requests changes to Table 11-2 Responsible Municipalities and Lead Jurisdictions.

Del Mar urges that the Miramar Reservoir HA (906.10) Torrey Pines State Beach at Del Mar (Anderson Canyon) segment be removed from Table 11-2 for the same reasons noted previously.

Responses: Please see the response to Comment 175.

Comment 196

Del Mar requests changes to Table 11-3 Prioritized List of Impaired Waters for TMDL Implementation.

Del Mar urges that Miramar Reservoir HA (906.10) watershed be removed from Table 11-3 for the same reasons noted previously.

If the revisions requested by Del Mar are not incorporated, the end result for this and future TMDLs will be unpredictable and unjustifiable expenditures of limited resources. Del Mar seeks consistency throughout the region and the State so that an "even playing field" is set as originally intended by the SWRCB and the Delisting Policy. If the implementation of the Bacteria TMDL Project I continues as described in the Draft Technical Report, the Regional Board will be deviating from the SWRCB Listing Policy and defying its purpose. Del Mar believes the revisions to the delisting shown in the 303(d) List for 2006 should occur prior to approval of the Bacterial TMDL Project I.

We believe that our position is consistent with what we have heard you say on numerous occasions…..that agencies need to be strategic in what they attempt to do in order to leverage limited resources in the most cost-effective ways.

Response: We disagree that this and future TMDLs will cause unpredictable and unjustifiable expenditures of limited resources. The goal of the implementation plan is to attain and maintain WQOs throughout all seasons and hydrologic conditions. If dischargers have met this burden, then their only expenditures would be to report that WQOs are attained, and reporting would occur at an appropriate frequency as specified in the discharger's monitoring and reporting programs.

Comment 197

The last paragraph of Section 11.5.3 indicates that dischargers to certain beach segments that were being de-listed in 2006 would not be required to prepare Bacteria Load Reduction Plans. There are a significant number of other beaches that were proposed for de-listing in 2006 but were not delisted; these beaches are expected to be resubmitted and successfully de-listed in 2008. In addition, other beaches have since been evaluated and have met delisting criteria (all the water segments in Dana Point HSA 901.14, for example), and are anticipated to be delisted from the 2008 303(d) List. The Bacteria Load Reduction Plans are not scheduled to be completed until 2009. The second sentence in this paragraph should be modified as follows:

> *For those beach segments de-listed in 2006 or 2008, or other beach or creek segments removed from the 303(d) list prior to the scheduled completion date for its respective Bacteria Load Reduction Plan, municipal dischargers and Caltrans need not prepare Bacteria Load Reduction Plans for their discharges in these watersheds.*

Response: Please see the response to Comment 190.

Comment 198

Page 7, Section 1.4 This section discusses modeling used to estimate existing bacteria loads and discusses using estimates for model flow and bacteria loading. Later on page 160 the report discusses collection of useful data for model improvement. There should be some language added that gives flexibility written in to the implementation plan for the new data and results.

Response: Please see the response to Comment 58.

Comment 199

Page 60, Section 7.1.1.d explains the complexity inherent in bacterial modeling. Any kind of watershed loading or waterbody dispersion model must be developed, calibrated and validated with rigorous data sets. The report indicates this did not occur with Chollas Creek. Therefore, it is recommended that a monitoring program be established to gather the data necessary to tailor the model for this watershed.

Response: Dischargers are free to propose the execution of special studies for the purpose of gathering data for model improvement as part of their Bacteria Load Reduction Plans.

Comment 200

The City of Poway is requesting to be removed from its responsibility for the listed areas of the San Diego River Watershed: Mission San Diego, HSA (907.11) and Santee HSA (907.12). The justification for this request is that in California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-0001, the City of Poway has been removed from responsibility for the entire San Diego River Watershed.

As you know, the City only occupies 120 acres of this watershed, all of which is protected habitat. This area is located on top of Iron Mountain, as shown on the enclosed map. Because this land is zoned as Open Space—Resource Management, it can never be developed. This small area will remain in a natural state and does not have the potential to discharge pollutants to the watershed.

Response: We agree with this comment. The City of Poway has been removed from the list of responsible municipalities in hydrologic sub-areas 907.11 and 907.12.

Comment 201

Section 11.5.3 specifies that dischargers to certain beach segments that were being removed from the 303(d) list in 2006 would not be required to prepare Bacteria Load Reduction Plans. This section makes no reference to segments eligible for removal from the 2008 list. While the suitable segments in Laguna Beach were eligible for removal in 2006, they must now wait for the 2008 cycle for final delisting. The final TMDL should have provisions for exemption from the requirements of creating a Bacteria Load Reduction Plan for segments delisted in the 2008 cycle.

Response: Please see the response to Comment 190.

Comment 202

The City of Laguna Beach is also concerned with the seemingly "open ended" commitment implied by the draft TMDL. The final TMDL should provide provisions for dischargers who meet the goals of the program to be exempted from the requirements of the program.

Response: The provisions for dischargers who have implemented bacteria load reduction strategies, which have resulted in subsequent de-listings, are described in the response to Comment 175.

Comment 203

The City of Laguna Beach has invested a great deal of effort and funding into bacteria reduction and the protection of beneficial uses along our shoreline. The results of these efforts are clear- the Pacific Ocean shoreline along much of the Laguna Beach coastline meets the bacteria standards established in the 303(d) delisting guidelines. The City feels that future efforts and funding commitment should be made in areas where bacteria is a significant problem rather than areas where goals have been met.

Response: We agree with this comment and therefore the language in the Technical Report acknowledges the reduced level of effort needed from dischargers in areas meeting de-listing guidelines. Please see the response to Comment 175.

Comment 204

Lastly, the City continues to support the Aliso Creek SUPER project to meet the TMDL standards in the Aliso Hydrologic Sub-Area. The City urges the Regional Bard to adopt a balanced approach to achieving water quality objectives which includes source control, public outreach and Best Management Practices as proposed by the SUPER project; bio-filtration, erosion prevention, structural diversions and in-stream treatment.

Response: We agree that a balanced approach to achieving WQOs should include source control, public outreach, and the various BMPs suggested in this comment. Dischargers should include such measures in their Bacteria Load Reduction Plans. Also, dischargers should not wait for TMDL adoption and approval to begin reducing loads from other pollutants.

Comment 205

The issue of uncertainty about the linkage between indicator bacteria and human pathogens is worsened by the fact that farmers may choose to use composted manures and greenwaste mulches to reduce the use of manufactured nutrients and control runoff. Studies have shown substantial increases in the presence of indicator bacteria, but no human pathogens, when composted manures and greenwaste are used. If farmers administer those practices in an effort to come into compliance with stormwater regulations they may find they are running afoul of the TMDL because of the production of indicator bacteria.

Response: We agree that properly composted manure should not contain pathogens, and therefore bacteria from farming sites using properly composted manure do not pose a public health threat. Composted manures and greenwaste mulches can be effective at minimizing runoff; therefore, we anticipate its use will help, and not worsen, bacteria loads leaving sites.

Comment 206

Should this TMDL move forward as written it is our suggestion that farm sites identified as sources of indicator bacteria be further tested by the Regional Board to make the positive identification that human pathogens are present. While we have no reason to question that farm sites could be sources of indicator bacteria, it is imperative that positive linkages be established to avoid punitive measures that will do nothing to improve water quality on our beaches and in our creeks.

Response: We agree that testing for human pathogens may be a definitive way to rule out farm sites as sources of pathogens. However, this is not needed as a first step in ensuring that discharges from farms contain pathogens (or even bacteria). We are assuming that farms are not discharging bacteria and pathogens because they are prohibited from doing so under waivers of WDRs. We may have to enforce the waivers in order to confirm this assumption. If, when doing so, we find that farmers are abiding by the conditions set forth in their waivers, yet there are still bacteria loads coming from agricultural land use areas, we could require the owners and operators of the agricultural to perform testing for pathogens.

Comment 207

Concerns About Waste Load Allocation (WLA) Metrics Should be Addressed Through WQBELS

One of our earliest consensus points with all members of the SAG was that expressing the waste load allocations as number of bacteria colonies per year (billion MPN/yr) was not a useful metric for measuring compliance with the TMDL. Many of the concerns over the last four years of public participation and at the April 25th public hearing centered on this measurement of TMDL compliance.

An often-voiced complaint is that using an annual load metric in the TMDL will make it impossible to assure compliance in the beaches and creeks. We certainly agree that importing the WLAs wholesale into permits would be confusing and detrimental to achieving cost-effective reductions. However, such metrics can and should be changed when the water quality based effluent limits (WQBELs) are developed in response to the WLAs. Indeed, the draft Technical Report specifically allows for this possibility. "WQBELs may be expressed as numeric effluent limitations using a different metric, or, more likely, as BMP development, implementation, and revision requirements." Draft Technical Report at 150.

As staff explained at the April 25th hearing, such matters are appropriately resolved after the adoption of the TMDL. Indeed, a WQBEL is based on the WLAs in the adopted

TMDL. We agree that the number of days that exceed beach water quality standards may be a more easily implementable metric than total number of bacteria in the water for implementation of the TMDL. However, we cannot agree that using the annual or monthly load metric in the TMDL itself is incorrect. WQBELs need only be consistent with the requirements of the WLAs in a TMDL, the two need not be identical. As staff has explained, the stakeholder group will be engaged by staff to choose a useful and appropriate metric for implementation.

Response: We agree with this comment. An appropriate metric for measuring compliance with TMDLs will be selected with public input upon re-issuance of the pertinent NPDES requirements.

Comment 208

A Reference-Based approach is appropriate for setting waste load allocations and load allocations.

Heal the Bay strongly favors the Los Angeles Water Quality Control Board's approach in setting the TMDL targets for the Santa Monica Bay Beaches Bacteria TMDLs. This approach is based on exceedances of fecal indicator bacteria standards for both interim and final TMDL targets. The most important beneficial use that is impaired by high fecal indicator bacteria densities is recreational water contact. A TMDL based on the total number of fecal bacteria in the water, rather than the numbers of days that exceed beach water quality standards, will not lead to beneficial use attainment and is an insurmountable compliance assurance problem. How will anyone be able to determine compliance with a monthly waste load allocation in terms of billion MPN/month? Further, how will this approach verify that the receiving waterbody is no longer impaired?

Every time a beach water quality standard is exceeded, a beach gets closed or warning signs are posted, and this is an impaired beneficial use. An exceedance based approach is more consistent with current risk management procedures, AB 411 requirements, and public health protection.

Response: We agree that measuring TMDL compliance with exceedance days may be a suitable metric for beaches. Therefore, we encourage the commenter to stay involved with the public process associated with the re-issuance of the municipal NPDES requirements, which is the appropriate forum for determining the compliance metric(s) for these TMDLs. Please see the response to Comment 147 for further discussion. Unlike the Santa Monica Bay TMDLs, this project is inclusive of inland creeks, and therefore compliance methods must be suitable for determining attainment of standards in creeks in addition to beaches.

We further agree that a compliance metric based on exceedance days is consistent with current risk management procedures. However, in terms of formulating strategies for BMP implementation, the exceedance days approach does nothing to help dischargers quantify the magnitude of existing loads. A loading approach provides the ability to calculate percent reductions needed in each unique watershed. For example, in the San Luis Rey watershed, a 3 percent reduction is needed in fecal coliform loading, compared

to a 53 percent reduction needed in the San Diego watershed. Further, the load contributions by land use are discussed in Appendix I. This information is useful in determining which watersheds require the most effort, and what types of BMPs may be effective, and where they might be placed. An exceedance day-based analysis does not provide such useful information.

5.6 Compliance Schedule

Comment 209

Compliance Schedule and Proposed Reductions: We are concerned that the time schedules and percent reductions proposed are too aggressive and do not fully recognize; 1) the bacteria source identification technical advances and special studies (natural loading etc.) that are necessary to achieve the bacteria reduction levels, and 2) the time necessary for public agencies to execute the watershed agency agreements, work contracts and budget the necessary funds to execute the implementation plan. We recommend the time schedule be reevaluated to allow adequate time to address the necessary steps for successful compliance.

Response: We disagree that the proposed compliance schedule is too aggressive and does not recognize the need for special studies or the time needed for dischargers to execute the implementation plan. The bacteria TMDLs can be recalculated if justified by technical advances or the results of special studies. However, these advances or studies are unlikely to justify no bacteria load reductions, thus moving forward with implementation of the TMDLs is justified. In establishing the compliance schedule for achieving the TMDLs, we must balance the need of the dischargers for a reasonable amount of time to implement an effective BMP program against the broad-based public interest in having water quality standards attained in beaches and creeks as soon as practicable. The public interest is best served when dischargers take all reasonable and immediately feasible actions to reduce pollutant discharges to impaired waters in the shortest possible time. In light of these considerations, the San Diego Water Board believes the compliance schedule in the Technical Report is reasonable.

Some of the beaches and creeks included in the Technical Report were placed on the List of Water Quality Limited Segments in 1996. Others were placed on the List in 1998 or 2002. If the dischargers were not aware of the List of Water Quality Limited Segments during any of these listing cycles, the problem was brought to their attention in March 2003 when the San Diego Water Board held its first public workshop and CEQA scoping meeting regarding these TMDLs.

In 1999, WDRs for Caltrans' MS4 discharges were issued by the SWRCB. Receiving Water Limitation No. C-1-3.a of these WDRs (SWRCB Order No. 99-06-DWQ) prohibits the discharge of stormwater from a facility or activity that causes or contributes to the violation of WQSs or WQOs. Similarly, dischargers regulated under San Diego Water Board Order Nos. 2007-0001 and Tentative Order 2007-0002 (San Diego County and Orange County MS4 NPDES requirements for discharges of urban runoff) are subject to a similar prohibition (Receiving Water Limitation No. A.3.a.1).

The Caltrans, San Diego County, and Orange County MS4 NPDES requirements place an additional obligation on the dischargers to submit a report to the San Diego Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of WQSs (Receiving Water Limitations No. A.3.a.1 respectively). The WDRs require implementation of the BMPs described in the report. This obligation is

triggered when either ***the dischargers*** or the San Diego Water Board determine that MS4 discharges are causing or contributing to an exceedance of an applicable standard, in this case, indicator bacteria and their associated beneficial uses. To date, neither Caltrans nor the municipal dischargers have formally made this determination or notified the San Diego Water Board as required by conditions of their WDRs.

Considering that initiation of the TMDLs took place upon the first public workshop in 2003, and the existing obligation under the Receiving Water Limitations, the compliance schedule has not been modified. Dischargers should not be rewarded for their lack of action to restore WQOs in beaches and creeks during wet weather flows. Dischargers should have initiated BMP planning and monitoring to address the impairments following adoption of WDRs in 1999 (Caltrans), 2001 (San Diego County MS4s), and 2002 (Orange County MS4s), respectively. We recognize that dischargers will face difficulty reaching final TMDLs, therefore we are developing a reference system/natural sources exclusion Basin Plan amendment, as discussed in the response to Comment 2. We will recalculate final wet weather TMDLs and modify the compliance schedule upon adoption of this Basin Plan amendment.

Comment 210

Table 1-2- Compliance Schedule – The timeframe of 5 to 7 years for a 50% waste load reduction is not realistic. The control of wet weather flows is a substantial undertaking. This allows inadequate time to fine-tune the modeling and use the results to cite the location of BMPs, identify sources, develop plans, develop memorandum of understanding with stakeholders, secure funding, acquire land, conduct permitting, bid out contracts and install BMPs.

Response: Please see the response to Comment 209.

Comment 211

The compliance schedule should separate the timeframes for dry weather versus wet weather compliance. The timeframe of 5 to 7 years for a 50% wasteload reduction, or of 10 years to 100% compliance, may be feasible for dry weather due to relatively small water volumes; and suitable because that's when most REC-1 use occurs. It is not realistic for storm flows, which account for around 98% of the annual load, because of the time required to fine-tune the modeling, locate large-volume BMPs, identify sources, develop plans, develop memoranda of understanding with stakeholders, secure funding, acquire land, conduct permitting, bid out contracts, and complete the installations. Since wet weather flows affect only a tiny percentage of REC-1 users, the separation of dry and wet weather schedules would also clarify that first priority should be given to dry weather programs, which would be most cost-effective. Furthermore, certain waterbodies were originally only 303(d) listed as impaired for wet-weather exceedances, so applying dry-weather TMDLs and schedules to them is inappropriate. We recommend that a wet-weather compliance schedule for Priority 1 sites should be 10 years for 50%, 15 years for 75% and 20 years for 100%.

Response: We have changed the compliance schedule (Table 11-4) to differentiate between dry weather and wet weather wasteload reductions. Attainment of dry weather TMDLs for REC-1 (enterococcus and fecal coliform) are required soonest. More time is allotted for attainment of wet weather and total coliform SHELL TMDLs.

Comment 212

The compliance schedule in Table 1-2 appears to combine both wet and dry weather TMDLs. In the City of San Diego approximately 296 days of the year are dry weather days, and most recreational activities occur in dry weather. It will be counterproductive to combine the relatively small, but important, dry weather loads with the large, but infrequently occurring and difficult to control, wet weather loads. Other regions (e.g., Santa Monica) have separate bacteria TMDLs for dry and a wet weather, and have applied different compliance schedules, as the control of wet weather loads is a considerable technical challenge that will take additional time and resources to achieve. As stated in our June 20, 2006 letter, we recommend a phasing of the wet- weather compliance schedule such that for Priority 1 locations the reduction target is 25% in year 5, 50% in year 10, and 75% in year 15 and 100% final TMDL compliance in year 20. The Priority 2 and 3 schedules should be adjusted accordingly.

Response: Please see the response to Comment 211.

Comment 213

TMDL implementation is recognized as likely to be very costly. We anticipate that the Bacteria Load Reduction Plans for each impaired water body will consequently be encouraged to give priority to conditions where real potential risks for public health are highest, especially during the interim prior to the 5-year re-evaluation date. In recognition of the costs and substantive technical issues, permittees should not, however, be forced to prematurely chase moving targets. **The overall Compliance Schedule should not set a 50% compliance date sooner than the recommended 5-year re-evaluation provision** so that TMDLs can be re-calculated, where appropriate, adequately in advance of mandatory compliance progress benchmarks. The overall Compliance Schedule should also reflect the daunting realities of procedural, fiscal, and inter-party coordination and staffing required to plan, design, fund, acquire land and construct multiple structural BMP projects to treat wet-weather flows over large percentages of the watersheds' urban drainage areas – very likely concurrently with implementing TMDLs for other constituents.

Please be assured that MS4 permittees have not deferred serious compliance efforts pending approval of the TMDL document or its associated schedule. It should be noted that as a result of permittees' efforts to date, the vast majority of the Orange County beach segments addressed in the Draft Report already meet de-listing criteria and are expected to be de-listed within the current 303(d) listing cycle. Despite permittee requests, RWQCB staff declined to delete these de-listable segments from the TMDL Report, helping perpetuate the (erroneous) perception that MS4 permittees haven't been taking any corrective action. Consequently, the perception also persists that setting an

overall Compliance Schedule adequate for permittees to address the more difficult conditions would allow them too much leeway to delay taking action in the short term. To address these concern, **the Load Reduction Plan to be prepared for each impaired waterbody in Year 1 should be required to include a Site-Specific Compliance Schedule with expedited timeframes wherever more rapid compliance is feasible.** These site-specific schedules, which would be expected in some cases to achieve compliance prior to the 5-year re-evaluation, should be incorporated into the NPDES permits along with any revised targets or allocations at the time of the 5-year TMDL re-evaluations.

The compliance schedule in the TMDL Report should reflect not only the priority that should be given to ocean beaches due to their high dry-weather REC-1 usage rates, but the practical reality that achieving compliance is going to be substantially more difficult and costly during wet weather in all already-developed watersheds. **As an outside maximum, we recommend the following overall deadlines for compliance:**

Year after OAL approval	
Year 1	**TMDL formally approved; Bacteria Load Reduction Planning and Data Gap Infill studies proceed**
Year 5	**5-year re-evaluation and re-calculation of models, targets and allocations based on new information**
Year 7	**50% compliance for Dry Weather at Beaches**
Year 12	**100% compliance for Dry Weather at Beaches; 50% compliance for Dry Weather at Creeks**
Year 17	**100% compliance for Dry Weather at Creeks; 50% compliance for Wet Weather at Beaches**
Year 22	**100% compliance for Wet Weather at Creeks and Beaches**

Response: The compliance schedule is not too aggressive for the reasons outlined in the response to Comment 209.

In terms of the waterbodies that have recently been delisted, please see the response to Comment 190.

Comment 214

Table 9-5: Final Wet Weather TMDLs for Total Coliform Expressed as an Annual Load's percentage of reduction does not allow for any bacteria in all storm events. It is unrealistic to expect that the City can achieve this goal in 10 years. Table 9-9: Final Wet Weather TMDLs for Enterococcus Expressed as an Annual Load's percentage of reduction does not allow for any bacteria in storm events. It is unrealistic to expect that the City can achieve this goal in 10 years.

Response: We realize achieving the necessary load reductions will be challenging. Therefore we have initiated a reference system approach Basin Plan amendment to account for natural sources of bacteria. Please see the response to Comment 2.

Comment 215

The TMDL states that the interim reductions must be required 10 years after OAL approval. It is the City of San Diego understands that TMDLs become officially once the EPA approval is given. We recommend that this statement be modified to reflect the complete process required by 40 CFR.

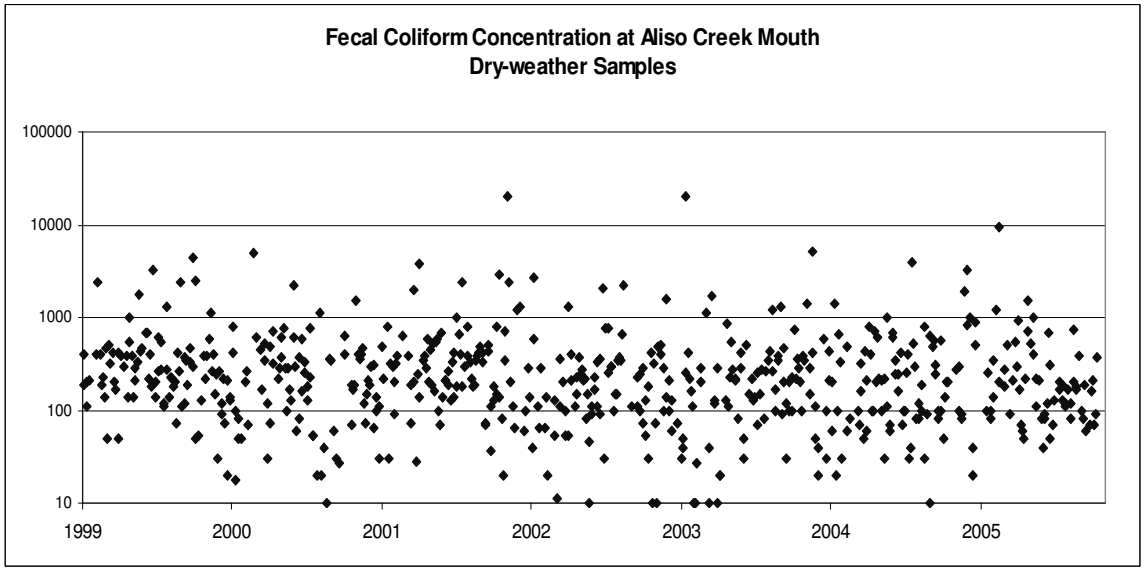
Response: Once OAL approves a rule or regulation, it goes into effect as state law and is therefore implementable. The rule or regulation remains in effect until modified. If, in its review process, USEPA requires changes to be made to the TMDLs, we would modify them appropriately.

Comment 216

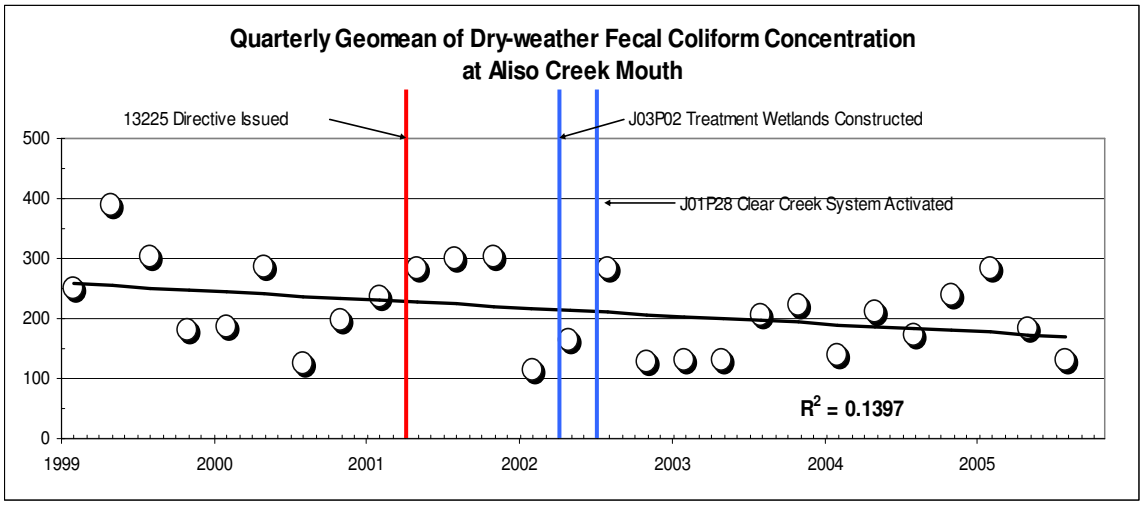
Section 9 Total Maximum Daily Loads and Allocations and Section 11 Implementation Plan: The current load reduction targets and compliance timeframes for MS4 discharges are unrealistic and unachievable and should be modified for the following reasons:

a) The load reductions and timeframes do not consider the lessons learned from the 5 year implementation of the Aliso Creek CWC §13225 Directive for bacterial impairment. To illustrate the challenges of addressing bacterial contamination the following two graphs have been developed. The first graph below shows all dry-weather fecal coliform concentrations (mpn/100 ml) at the mouth of Aliso Creek from 1999-2005. In the second graph, this data has been transformed to a quarterly geo-mean value in an effort to show trends in the data. The red vertical line indicates when the 13225 Directive was issued and intensive monitoring and BMP implementation began in the watershed. The two blue vertical lines indicate when major treatment BMPs were activated.

Graph 1



Graph 2



b) Over the past 7 years, the municipalities in the watershed have invested an estimated $10,075,400 in bacteria control BMPs, including $2,500,000 in coastal area diversions. Additionally, from April 2001 through October 2005, $2,858,251 has been spent on monitoring and data analysis. Despite these intensive BMPs efforts, a simple regression analysis of the data seems to indicate only a very weak downward in the data. The current TMDL implementation schedule requires a 50% reduction in bacteria

loads in 5 to 7 years depending on watershed priority. Based on our experience in Aliso Creek, this timeframe is far too short to achieve such reductions even with intensive BMP implementation.

c) In Section 1.5 Legal Authority for TMDL Implementation Plan, the following statement is made: "Much of these bacteria discharges result from controllable water quality factors which are defined as those actions, conditions or circumstances resulting from man's activities that may influence the quality of waters of the State and that may be reasonably controlled." (emphasis added) This assumption erroneously implies that all sources of bacteria discharged via the MS4 system are controllable and has lead to the supposition that 100% reduction of dry weather bacteria loading is possible. As discussed previously, the sources of bacteria are myriad and complex. Regrowth of bacteria within the MS4 system, wildlife inputs from birds, bats and mammals living within the storm drains, and bacteria from organic matter such as leaves, soil and grass clippings are just a few common sources of fecal indicator bacteria in the MS4 system which do not contribute human pathogens, and are not controllable. Additionally, experience in the Aliso Creek watershed has shown that natural sources of bacteria can eliminate the reductions achieved through BMPs. At the J01P28 Clear Creek System, clean, treated water is discharged from an ultra-violet light disinfection system into an earthen channel with no additional inputs. After traveling 30 feet in an earthen channel before discharge into the creek, bacteria levels in the treated discharge can rebound to above water quality standards.

d) Meeting the shellfish water quality objectives should not be addressed until shellfish populations in the affected areas are documented to be sufficient for recreational harvesting. Regional Board staff has stated in meetings with the SAG that the Department of Fish and Game indicate that shellfish resources in the San Diego Region have been overfished and are not currently present at harvestable levels, if at all. As such, bacterial water quality is not the limiting factor for this issue and improvement in bacteria water quality will not result in increases in shellfish populations. Compliance efforts and timeframes should be focused on meeting REC-1 standards in a realistic manner.

e) The implementation plan should be revised to focus efforts on the reduction of sources of human pathogens rather than bacteria in the following manner:

   i) Municipalities will confirm and clearly document that there are no sources of human sewage (and therefore human pathogens) discharging into the MS4 system;

   ii) Targeted monitoring programs will be developed to identify "hot spot" storm drain discharges that are having a negative impact on bacteria levels in the receiving water, and source tracking efforts will be

employed to determine whether the source is able to be identified as anthropogenic;

iii) BMPs will focus on urban-runoff reduction and public education regarding human-controlled sources of bacteria, such as pet waste and other activities.

f) Chairman Minan expressed support for an adaptive and flexible TMDL during the February 8, 2006 Board meeting:

i) Chairman Minan stated,"…I understand you are saying that it's adaptive, but when you look at the reality of the situation, I'm concerned that it may not be as adaptive as you are representing. I would be interested in your analysis." (February 8, 2006 Regional Board Meeting Transcript, 117)

ii) Chairman Minan reiterated this concern later in the hearing, "…I'm going to be very interested when the staff come back to tell us exactly how adaptive and flexible this proposal is, because I'm not convinced at the current time that it is very adaptive and flexible….I need to see the evidence to support the position with the staff on that." (February 8, 2006 Regional Board Meeting Transcript, 143)

Response (a): We disagree that load reductions and timeframes do not consider lessons learned. The compliance schedule is greater than 10 years—which is exceptionally long for TMDLs. Dischargers should focus their efforts on controllable sources of bacteria that may be associated with pathogens, as suggested in your comment e). Please see the response to comment e) below.

Response (b): We are aware of the regrowth phenomenon in conveyance pipes and hydromodified channels. This information supports the need for the natural sources exclusion approach described in the response to Comment 2, and to return hydromodified channels to more naturally functioning channels.

Response (c): Please see the response to comment e) below.

Response (d): We agree that requirements to meet the SHELL WQOs should be extended, since shellfishing is not known to occur in all areas of the region. Although it is true that shellfish populations are small in some areas, we are unsure if this is because of overfishing, poor environmental conditions, or both.

Response (e): The implementation plan will not be revised to specify that efforts to reduce bacteria should be accomplished in a certain manner, since we cannot dictate a means or methods of compliance with meeting TMDLs. The level of detail specified by the commenter is more appropriately placed in the Bacteria Load Reduction Plans, submitted by the dischargers, rather than the TMDL Implementation Plan. The implementation plan, by design, leaves dischargers with the flexibility to achieve bacteria reductions in a manner that is preferable to the discharger.

Although we cannot include the suggested language in the Technical Report, we believe the ideas specified in this comment represent a reasonable approach for achieving the

load reductions. Since bacteria from natural sources may or may not contain harmful pathogens, we believe it is reasonable to prioritize efforts first on curbing anthropogenic sources of bacteria, as the commenter suggests. This approach could also build a body of data and information with which to apply the natural sources exclusion approach to a refinement of the TMDLs. See the response to Comment 2 for a discussion of the natural sources exclusion approach.

Response (f): Please see section 4.3 of this appendix for the response to this comment.

Comment 217

The City of San Diego would like to take this opportunity to express our appreciation to the Regional Board for reviewing our compliance schedule concerns and modifying the compliance schedule. On page 72, the modified compliance schedule is for all pollutants listed in the watershed. The City of San Diego is concerned that new pollutants listed in at the end of the proposed compliance schedule will be required to achieve compliance is a condensed time schedule.

Response: We suggest the City of San Diego address all known problematic pollutants in their Pollutant Load Reduction Plans in order to avoid having to achieve compliance in a condensed time schedule. Dischargers should not wait for TMDL initiation to begin strategies for reducing pollutants.

Comment 218

Table 11-5 of the Draft Technical Report presents a 'tailored' Compliance Schedule unique to Chollas Creek that extends for 20 years, with the justification that Chollas Creek dischargers will be comprehensively addressing BMP planning and load reductions for copper, lead, zinc, diazinon and trash in addition to bacteria. Considering the many acknowledged uncertainties surrounding the correlation of bacteria and actual human health risk, and the potentially enormous cost of pursuing bacteria control programs that may ultimately be recognized as not entirely justified, comprehensive multi-parameter planning and tailored compliance schedules should be actively encouraged in the TMDL for any waterbody listed as impaired or otherwise impacted by more than one constituent of concern. We suggest that the text following Table 11-5 be amended to add the following:

> *Dischargers in other bacteria-impaired watersheds will also be addressing impairments and/or load reduction programs for other pollutant constituents (i.e. metals, pesticides, trash, nutrients, sediment etc.) concurrently with the bacteria load reduction requirements in this TMDL. In these cases, the dischargers will have the option to submit a Comprehensive Load Reduction Plan for all constituents of concern in lieu of the Bacteria Load Reduction Plan for the impaired waterbody, and to propose an appropriately tailored comprehensive compliance schedule. Comprehensive compliance schedules tailored under this provision may not extend bacteria compliance milestones beyond the interim milestones set forth in Table 11-5.*

Response: We have revised the language following Table 11-5 to incorporate the concepts discussed in this comment (some revisions were made to the suggested wording; please see Technical Report for new text). One important advantage of addressing multiple pollutants concurrently, instead of consecutively, is that fewer structural BMPs will be needed. This is considered environmentally superior because we anticipate that possible adverse environmental impacts would most likely be associated with the construction and installation of structural BMPs.

Extension of the compliance schedule described in Table 11-4 is not automatic upon completion of a Comprehensive Pollutant Load Reduction Plan. Consideration for schedule extensions will take place on a case-by-case basis.

Comment 219

The overall Compliance Schedule [Table 11-4 in the current draft] should not set a 50% compliance date sooner than the recommended 5-year re-evaluation provision. *The second and third recommendation, regarding Site-Specific Compliance schedules, was addressed in my April 12, 2007 letter urging that tailored Comprehensive Load Reduction Plans and Comprehensive Compliance Schedules be available as an option for other watersheds instead of just for Chollas Creek.*

Response: Please see the responses to Comments 23 and 218.

Comment 220

In addition, several dischargers in bacteria-impaired watersheds will also be addressing impairments and/or load reduction programs for other pollutant constituents (i.e. metals, pesticides, trash, nutrients, sediment etc.) concurrently with the bacteria load reduction requirements in the bacteria TMDL. In these cases, the dischargers should have the option to submit a Comprehensive Load Reduction Plan for all constituents of concern in lieu of the Bacteria Load Reduction Plan for the impaired waterbody, and to propose an appropriately tailored comprehensive compliance schedule similar to that provided for Chollas Creek in the current version of the Project I Bacteria TMDL.

Response: Please see the response to Comment 218.

Comment 221

Compliance Schedule Is More Than Adequate To Address Bacteria Reductions

Coastkeeper supports the five to seven year schedule to meet 50% of interim reductions and the 10 year compliance schedule to meet 100% of interim targets. While we would like to see more immediate reductions, we appreciate the priority criteria outlined in the TMDL. We will work with the municipalities and EPA representatives to ensure that adequate progress is made to reach the TMDL milestones.

We do note that the Santa Monica Bay TMDL for fecal bacteria included a three year compliance schedule. That more aggressive timeline applied only to dry weather flows,

and has proved very effective in reducing beach closures related to bacteria exceedances. The San Diego approach does not separate out dry and wet weather compliance schedules. However, the San Diego schedule has 50% reductions in the first 5-7 years depending on waterbody priority. As dry weather exceedances are less difficult to address than wet weather, we anticipate that municipalities will attempt to address these first. Given the success of the Santa Monica TMDL in an even shorter initial timeframe, we feel the five year milestone and ten year 100% interim reductions are certainly reasonable.

We understand the distinction made for Chollas Creek, which will be operating under a TMDL for dissolved metals as well as for bacteria. If the need for additional time is demonstrable in this instance, where best management practices will address multiple pollutants, staff should include such demonstrations in their findings. The Regional Board should not assume that waterbodies impaired by more than one pollutant will require additional time.

We cannot support the approach suggested by Laguna Niguel, that dischargers propose a compliance schedule specific to their waters after the adoption of the TMDL. This approach would undermine the certainty and transparency of the public TMDL process. Discharger plans would not be publicly noticed, and changes could be accepted by staff without the knowledge of the Board. We also note that the author's suggested language limits proposed schedules to the interim milestones (100% of reductions within 10 years). While we appreciate that compliance schedules would not be extended, as a practical matter, this would only give dischargers less time to clean up waterbodies impaired by multiple pollutants.

Response: Although we think it is preferable to address multiple pollutants, extension of the compliance schedule is not automatic. Extension of the compliance schedule will take place on a case-by-case basis. Stakeholders will have opportunity to review and comment on proposed changes to compliance schedules upon reissuance of the NPDES requirements that will be used to implement the TMDLs.

Comment 222

Compliance schedules should be separated based on the time of year (wet-weather vs. dry-weather) and type of receiving water (freshwater, saltwater, and estuarine).
In the Santa Monica Bay Beaches Bacteria TMDLs, compliance schedules vary based on the time of year. For instance:

- Targets were set for the AB 411 time period (3 years to comply), winter dry weather (November through March)(six years to comply), and wet weather (defined as a 0.1 inch storm plus 72 hours after the storm)(10 years to comply).
- The AB 411 targets was zero exceedance days, the winter dry weather target was 3 days, and the wet weather target was based on the 90th percentile storm year at a beach at the terminus of a reference watershed (approximately 22% exceedances which equals 17 days).

The system is appropriate for the San Diego Draft TMDL as well because dry-weather compliance should take less time, and this timeframe poses the greatest risk to human health.

Response: We agree that compliance with dry weather TMDLs will take less time and that this timeframe poses the greatest risk to public health. The compliance schedule does not preclude dischargers from taking this approach. In many cases, dischargers named in this project have succeeded in attaining dry weather TMDLs, as several beach locations have been de-listed since this project began.

5.7 Environmental Analysis

Comment 223

It is not at all clear that "reasonably foreseeable methods of compliance" exist for the capture and treatment of all storm flows on existing developments, that are not cost-prohibitive, may be ineffective in terms of remedying actual risk to public health, and/or are not contradictory to other environmental policy goals, such as conserving energy or avoiding wide-spread eminent domain actions to secure land for the treatment. As such, a design storm criterion should be designated to limit the maximum potential flow- or volume-based treatment obligation of permittees. This limit should be clearly identified as a ceiling rather than a floor, to allow permittees flexibility in pursuing preventative rather than treatment-based solutions.

Response: Designating design storm criteria is consistent with technology based effluent limitations in NPDES requirements. For example, NPDES requirements for concentrated animal feeding operations (CAFOs) designate that waste lagoons capture a 25-year, 24-hour storm. The industrial and municipal discharger NPDES requirements also contain "design storm" criteria. Designating design storm criteria for structural BMPs in the NPDES requirements to implement these TMDLs is reasonable. However, a design storm need not be designated as part of our environmental review of reasonably foreseeable method of compliance and economic considerations. The design storm for BMP sizing should be proposed by the dischargers based on site specific hydrology, water quality, and other characteristics that affect BMP construction at the project level phase of TMDL implementation. Section 12.4 of the Technical Report describes reasonably foreseeable methods of compliance for wet and dry weather loads, and these methods are divided into non-structural controls and structural controls. The examples described in this chapter are meant to be illustrative, not prescriptive.

Comment 224

The text should indicate the design storm size criteria for wet weather BMP development. It will be physically impossible to design and implement a BMP to capture and treat all storm flows. As such a design storm criterion, such as the 85th percentile storm for example, should be designated.

Response: Although a design storm is important for sizing structural BMPs, this level of detail is beyond the scope of the requirements that we must meet in order to comply with CEQA. Under CEQA, we must identify potential impacts from reasonably foreseeable methods of compliance—such as the implementation of BMPs. Calculating design storm size criteria is a site-specific consideration, and is more appropriately addressed by the project level CEQA analysis, not the planning level CEQA analysis (the Technical Report).

Comment 225

The Regional Board should notify all potential dischargers if the "Tributary Rule" is going to be applied to the installation of structural BMPs because additional land acquisition costs will need to be included in the economic analysis.

Response: The City of San Diego concluded that the construction of extensive detention and diversion/infiltration facilities, requiring the acquisition and demolition of hundreds of acres of developed land uses, would be an inevitable consequence of the TMDLs based in part on a belief that we would strictly interpret and apply the "tributary rule"[21] to prohibit the construction of BMPs within urban creeks. While all waters tributary to urban creeks should be of a quality consistent with the attainment in the creeks of the WQOs necessary to support the beneficial uses designated for the creeks, this policy does not, necessarily, preclude the installation of pollutant reduction BMPs in urban creeks or their tributaries. Source control is the preferred means of compliance with the TMDLS. However, in-stream structural BMPs may be reasonable, depending on the location and type of BMP, provided that they are consistent with the beneficial uses of the creek, and the natural aquatic ecosystem characteristics of the creek. This level of detail should be evaluated by municipal dischargers in coordination with the San Diego Water Board when the dischargers propose specific projects for structural BMPs to achieve the load reductions allocated to them for the implementation of the TMDLs. Please also see the response to Comment 233.

Comment 226

The City notes that the relationship between the State Board and the Regional Board with respect to the finality of environmental determinations is not well-defined. Water Code section 13245 states that Basin Plan amendments (such as TMDLs) do not have the force and effect of law until the State Board approves the amendment. Under CEQA and the State Board/Regional Board's CEQA regulations, a notice of decision regarding the environmental determination is to be filed with the Secretary of Resources. CEQA Guidelines § 15252(b); 23 CCR § 3720. At what point is such a document to be filed with the Secretary of Resources regarding the Bacteria TMDL?

Response: We will file the Notice of Decision within 30 days of USEPA approval of the Basin Plan amendment.

Comment 227

An Inadequate Project Description and Examination of Compliance Alternatives Set the Stage For Failure.

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[21] The "tributary rule" reflects early interpretations of the scope and extent of "navigable water" subject to federal jurisdiction under the Clean Water Act. [*United States v. Ashland Oil and Transp. Co.,* 504 F.2d 1317, 1329 (6th Cir.1974); *Headwaters, Inc. v. Talent Irrigation Dist.,* 243 F.3d 526, 533-34, (9th Cir.2001),] Accordingly, water quality in tributaries must be consistent with the water quality objectives needed to support designated beneficial uses in downstream navigable waters. However, the City interprets the "tributary rule" to require strict attainment of the most stringent downstream water quality objectives throughout Chollas Creek and its tributaries.

A critical component of an EIR is the environmental setting. In San Diego County watersheds, many of the tributaries: (1) are surrounded by developed areas within which storm water is conveyed by storm drains to outfalls at canyon rims; (2) lie within canyons and contain "waters" which originate at the end of the storm drains; and (3) are ephemeral and dominated by urban runoff during all but infrequent precipitation. However, the Initial Study (page R-1 of the draft Technical Report) describes the environmental setting of much of the affected areas in one paragraph and is incorrect by characterizing the Miramar, Scripps, and Chollas Creek watersheds as having "inland areas [that] primarily consist of open space with some agricultural/livestock uses".

Response: Regarding the comment on land uses within the Miramar, Scripps, and Chollas Creek watersheds, Appendix R was revised to remove the reference to agricultural/livestock uses.

Comment 228

"CEQA Alternatives": Given that the above-noted significant effects appear to be unmitigable, CEQA requires the evaluation of alternatives that would lessen the impacts. One such alternative should be provided to set the TMDL to a higher level. Such an alternative may still result in Basin Plan compliance; however, the reduced need for BMP acreage would preserve more existing land uses, effectively mitigating (partially) the significant impacts to existing land uses. Alternatively, the environmental analysis should describe why such an alternative will not achieve the basic purposes of the project.

Response: We disagree that the potentially significant impacts of the reasonably foreseeable methods of compliance appear to be unmitigable. Nonetheless, an alternative that sets the TMDLs to a higher level may fail to meet applicable WQOs that support beneficial uses. Such an alternative could not be considered because it would not attain the basic objective of the proposed activity (the TMDLs).

Comment 229

The determination that works are prohibited in "receiving waters" may also have one other consequence. Representatives of the environmental community in San Diego are concerned that the outfalls of existing storm drains at the top of canyon walls has led to erosion on canyon walls and at the base of the canyon walls. To address these concerns, in some situations the City may wish, in conjunction with constructing storm drain improvements including detention basins, to extend the storm drains to the canyon floors in order to minimize this erosion. While it could be expected that, in general, erosion on these canyon walls would decrease because of to-be-constructed upstream detention works, a prohibition on works in waters of the US/State would preclude the City from addressing this community concern.

Response: The San Diego County stormwater NPDES requirements do not preclude dischargers from moving outfalls in Chollas Creek to address erosion problems.

Comment 230

Given the fact that this TMDL requires 100% compliance in all wet weather flows, we do not believe that this analysis evaluated all reasonably foreseeable methods. To achieve 100% compliance in wet weather flows, wet weather diversion or advanced treatment methods, beyond that of the Point Loma POTW, will be necessary to achieve storm flows that have NO bacteria. Treatment will be required to maintain existing creek hydrology at approximately 2/3 of the existing storm drain outfalls which currently flow in dry weather. Because of the Regional Board's interpretation of the tributary rule (page 13 of the Technical Report), and because bacteria are known to grow in storm drains, the Regional Board must consider the impacts of building advanced treatment works immediately upstream of the approximately 3,100 of the 4,660 outfalls which currently contribute to creek hydrology.

Response: We anticipate revised TMDLs to go into effect well before the final WLAs need to be met. In fact, we will recalculate TMDLs immediately after adoption of the reference system approach/natural sources exclusion Basin Plan amendment, as discussed in the response to Comment 2.

Comment 231

CEQA Compliance - The Analysis Impermissibly Applies Inconsistent Standards

The environmental analysis begins with a discussion of the standards that apply to the Basin Plan amendment. The document states that the Regional Board has specific obligations under the Public Resources Code because the TMDL establishes performance standards or treatment requirements, and sets out an abbreviated list of those specific requirements. *See* Basin Plan Amendment at 158 – 159. The document goes on, however, to state that the Regional Board "method of analysis" is similar to "tiering" and "limited its analysis in this document to the broad environmental issues at the Basin Plan amendment "performance standard" adoption stage." The documents then goes on to opine that "the Regional Board is not required, at the Basin Plan amendment adoption stage, to evaluate environmental issues associated with specific projects to be undertaken later to comply with the performance standards." *Id*. at 159. The document contains no citation to legal authority for these propositions. This is because these contentions are incorrect statements of the law.

Response: Appendix R, as revised in the March 9, 2007 version, does not equate the substitute environmental documents with a Tier I EIR. The appendix states that the San Diego Water Board has considered the pertinent requirements of state law,[22] and intends the analysis to serve as a tier 1 environmental review. The substitute environmental documents are not intended for others to tier off of, however, municipal entities can utilize all information included in the substitute environmental document when developing their own environmental documents.

[22] Public Resources Code section 21159 and 14 CCR section 15187

Comment 232

a. The Regional Board Does Not Fully Comply With Public Resources Code Section 21159

Here, the Regional Board concedes that the provisions of Public Resources Code section 21159 apply. Having made that concession, the Regional Board does not have the option to ignore the other specific requirements of that section. Nevertheless, the Basin Plan Amendment, completely ignores the requirements of subdivision (c) of section 21159, which states:

> The environmental analysis ***shall*** take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and ***specific sites***.

PUBLIC RESOURCES CODE § 21159(c)(emphasis added)

Looking at each category of analysis specified in Public Resources Code section 21159, subdivision (c), the Regional Board's analysis is deficient because the TMDL applies to various watersheds, including the Scripps, Chollas Creek, San Dieguito and San Diego River watersheds. Both the entirety of the Scripps and Chollas Creek watersheds are heavily urbanized, while the upper portions of the San Dieguito and San Diego watersheds are substantially open space. Thus:

- There will be distinctly different technical challenges to implementing even the most basic structural controls in Scripps and Chollas Creek watersheds compared to the upper portions of the San Diego River and San Dieguito River watersheds because most infrastructure installed in Scripps and Chollas will disturb existing structures, while there is open space available in the upper San Diego River and San Dieguito River watersheds;
- There will be distinctly different environmental challenges for these same reasons; particularly the potential for infrastructure within the upper watersheds to disturb sensitive habitat.
- If it is necessary for the City to acquire land to implement any structural controls, the economics of implementing these measures will be different in developed watersheds when compared to undeveloped watersheds because of the relative land values;
- Not one specific site is examined despite the unambiguous statutory requirement to do so.

Thus, the record clearly reflects that the analysis does not satisfy all of the statutory requirements of an environmental analysis under Public Resources Code section 21159.

Response: We expanded our discussion of specific sites in the March 9, 2007 revisions to Appendix R. This discussion looks at existing structural and nonstructural BMPs in all major land use categories in the watersheds of this TMDL project.

Comment 233

The Regional Board has made two different contentions regarding the adequacy of the environmental analysis: (1) that treatment controls are not a reasonably foreseeable method of compliance; and (2) that the Regional Board is not required to do a site specific analysis. The first contention is not factually supported; the second is legally incorrect.

As respects treatment controls, the Regional Board ignores three critical facts in that regard:

- There is no evidence that compliance in all watersheds can be achieved in practice during both wet weather and dry weather conditions by using only non-structural controls.
- Public entities subject to this TMDL have already deployed treatment systems to combat this problem;
- At least one lead agency – the City of San Diego – has stated that it intends to implement treatment controls because it perceives treatment controls as the only means of attaining the treatment standard.

Thus, the only facts that are available undercuts the Regional Board's contention that treatment controls are a reasonably foreseeable method of compliance, which under Public Resources Code section 21159(a), must have its impacts analyzed.

As respects site specific analyses, Public Resources Code section 21159(c) unambiguously states that an analysis shall take into account a reasonable range of specific sites. A contention to the contrary is simply an incorrect statement of the law.

Even if the Regional Board does not believe that it has the responsibility to implement PRC Section 21159(c) as interpreted above, the City believes that the Regional Board has defined the TMDL with enough specificity, particularly with respect to required load reductions (which dictate the types of BMPs required), the tributary rule, and prohibitions on in-stream diversions (which dictate the possible locations of the BMPs), and failure to develop a design storm (which leaves open the acreage requirements of the BMPs), to conduct a "programmatic" level of analysis of the reasonably foreseeable means of compliance. In accordance with Section 15187of the State CEQA Guidelines this analysis could utilize numeric ranges and averages when specific data is not available. Section 15146 of the CEQ Guidelines addresses the level of specificity that is required for projects such as the TMDL. For CEQA purposes, adoption of the TMDLs by the Regional Board is comparable to adoption of a General Plan or Community Plan by a jurisdiction's legislative body with land use powers. What is required is the production of information sufficient to understand the environmental impacts of the proposed project. The current analysis does not fulfill this requirement.

Response: We disagree that the level of specificity in the substitute environmental documents is not adequate. Appendix R contains adequate information and analysis for the public to understand the potential adverse environmental impacts of the project. In response to repeated comments pertaining to inclusion of discussions of treatment

systems and specific sites, we have modified Appendix R appropriately. Please see responses below for discussions pertaining to the tributary rule and where the BMPs can be located, and the design storm issue.

Design Storm - The CEQA provisions allow the San Diego Water Board to limit analysis in these substitute environmental documents to broad environmental issues which are ripe for decision at the TMDL adoption stage. At this stage, the San Diego Water Board is not required to evaluate environmental issues associated with specific projects undertaken to comply with the TMDLs. CEQA provisions allow for project level environmental considerations to be deferred so that more detailed examination of the effects of these projects in subsequent CEQA environmental documents can be made by the appropriate lead agency.

The San Diego Water Board does not need to designate the storm size for the design and construction of the BMPs to meet CEQA requirements for the TMDLs. The CEQA requires that the San Diego Water Board provide substitute environmental documents that contain sufficient information and analysis for the public to understand the potential adverse environmental impacts of the project, and to provide the San Diego Water Board with meaningful discussion and comment on these impacts. Our substitute environmental documents do that by describing a range of potential structural and non-structural controls the dischargers could construct or implement to meet the wasteload allocations (WLAs). The documents also discuss the potential adverse environmental impacts associated with those controls. Because the CEQA does not require the San Diego Water Board to speculate on the location or size of specific structural controls that the dischargers might choose to implement, we did not specify any sizing criteria such as a design storm.

The San Diego Water Board appreciates the City's efforts in moving forward with BMP planning, and is willing to discuss potential BMP siting and design issues, and different compliance monitoring approaches that could be used. However, we do not have the authority to delegate which methods or BMPs must be used to comply with the bacteria TMDLs. Additionally, it is not the purpose of the TMDLs to provide complete guidance for compliance. The San Diego Water Board has flexibility in making waste discharge requirements consistent with WLAs and establishing monitoring programs to gage compliance.

Tributary Rule - TMDLs allocate wasteloads to MS4 discharges, as opposed to receiving waters. For this reason, discharges from MS4s are required to meet WLAs. The WLAs are designed to restore water quality in receiving waters as defined by applicable WQOs. Since the San Diego County and Orange County municipal storm water requirements (Order No. R9-2007-0001 and Tentative Order No. R9-2007-0002, or their successors) will be used to implement the TMDLs at issue, the term "receiving waters" in this case refers to waters of the United States.

The conditions under which MS4s discharge to receiving waters are exceptionally diverse. This makes it difficult to define a precise "bright line" of demarcation for determining when MS4s end and receiving waters begin that will be applicable in every case. In fact, such determinations are often made on a case-by-case basis (such as with

the 401 Water Quality Certification Program). While case-by-case determinations will continue to be necessary in many instances, generally speaking, where an outfall exists, receiving waters extend upstream to the outfall location.

The issues of where WLAs must be met and where receiving waters begin are important for determining where to locate BMPs. The San Diego Water Board's typical practice has been to discourage implementation of BMPs in receiving waters. For example, Order No. R9-2007-0001 states that "urban runoff treatment and/or mitigation must occur prior to the discharge of urban runoff into a receiving water" (Finding D.10). However, the issue of BMP location ultimately depends upon site specific circumstances and how compliance with WLAs is to be assessed.

There are many different monitoring approaches that the San Diego Water Board can use to determine compliance with WLAs. For example, the Chollas Creek diazinon TMDL, Order No. R9-2004-0227 requires monitoring two stations in Chollas Creek for compliance with the diazinon WLA. This relatively simple compliance monitoring was justified because the principal control, namely banning the pesticide, had been accomplished, and water quality in Chollas Creek was meeting the interim TMDL milestone at the time the new MS4 requirements were adopted. In the extreme, the San Diego Water Board could require monitoring at every storm drain outfall, and at numerous locations in Chollas Creek and its tributaries. The compliance monitoring the San Diego Water Board likely will require will be something between these two approaches, and may depend on the level of dischargers' efforts to reduce pollutant sources and loading before the San Diego Water Board issues implementing orders.

Another compliance assessment issue to be considered is how monitoring data are analyzed. Again, a wide range of approaches are available to the San Diego Water Board to determine compliance. For example, a regression approach to analysis of monitoring data can be used, where the monitoring data must exhibit a certain regression slope over time to show compliance with WLA. Other approaches, such as averaging of data, can also be used if appropriate. For example, in making water quality assessments for listing and delisting purposes, the *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List* states that "samples collected within 200 meters of each other should be considered samples from the same location."

These different monitoring and compliance assessment methods may provide MS4 dischargers with the opportunity to implement a wide range of strategies for complying with TMDL requirements, including strategies that rely on restoration of receiving waters. The methods to be used to determine compliance will be developed following adoption of TMDLs, as municipalities develop urban runoff management plans that will implement MS4 requirements and TMDLs.

Finally, we assumed that structural BMPs could be built anywhere in the watershed, and did not exclude any land type from our analysis of potential impacts.

Comment 234

The TMDL and Environmental Analysis Do Not Satisfy the Criteria For Tiering

When applying statutes, specific statutes control over general. *See Cavalier Acres, Inc. v. San Simeon Acres Community Services District*, 151 Cal. App. 3d 798 (1984) (Where there is a specific provision requiring community services district to increase rates via ordinance, that specific statute controls over general provision allowing public entities to increase rates via resolution).

Here, the general provisions relate to tiered CEQA documents. *See* PUBLIC RESOURCES CODE § 21093 and 21094. The environmental analysis attempts to justify giving short-shrift to the topics required by Public Resources Code section 21159(c) under the guise of tiering; this violates the rule that specific provisions control over the general. Moreover, there are other problems with the Regional Board's reliance on the tiering provisions.

First, both Public Resources Code section 21093 and 21094 refer to the preparation of an environmental impact report as the first tier document. As the Regional Board readily notes, the environmental analysis for the basin plan amendment is **not** an EIR. *See* Remy, et al, *Guide to the California Environmental Quality Act*, 10th ed., at 495 (The definition of tiering "suggests that tiering must commence with the preparation of an EIR.") Thus, there is no authority for the proposition that the Regional Board may use a substitute document as a first tier CEQA document.

Further complicating this aspect of the Regional Board's environmental analysis are the specific provisions of CEQA Guidelines section 15253, which governs the use of an EIR substitute by a responsible agency. Specifically, subdivision (a) states a substitute document shall be used by another agency "granting an approval ***for the same project*** where the conditions in subdivision (b) have been met." Subdivision (c) of that same Guidelines section amplifies this limitation, stating:

> Where a certified agency does not meet the criteria in subdivision (b), any other agencies granting approvals for the project shall comply with CEQA in the normal manner.

Hence, the CEQA Guidelines make clear that the only permissible uses of a substitute document are with respect to that project, and not with subsequent related projects. Accordingly, it is inappropriate to treat the Basin Plan Amendment environmental analysis as a "first tier" document because no second tier document can legally flow from a "first tier substitute document."

It is also important to note that under CEQA Guidelines section 15253 subdivision (b), it is a responsible agency that may use the substitute document for subsequent approval of the project. Responsible agencies are "public agencies other than the lead agency which have discretionary approval power over the project." CEQA Guidelines section 15381. The only other California agency that has discretionary approval power over the Basin Plan amendment is the State Water Resources Control Board. Neither the Regional Board nor the State Board will issue subsequent approvals related to this project that will require CEQA compliance. Hence, the authorization in CEQA Guidelines section15253 does not apply to any subsequent activity that will involve site-specific impacts or any of the other analyses the Regional Board contends may be deferred until the second tier projects are implemented. Accordingly, the notion that the TMDL environmental analysis will serve as a first-tier analysis is inappropriate.

Second, Public Resources Code § 21093 states that the purpose of tiering is to expedite the construction of housing and other development projects by eliminating repetitive environmental review. Here, the project is not a development project; it is the imposition of performance or treatment standards. Thus, this activity does not fall within the type of projects the Legislature sought to expedite through tiering, and accordingly, there is no legal basis for the Regional Board to rely upon these principles in analyzing the impacts of the TMDL.

Response: Please see the response to Comment 231.

Comment 235

The project description is also a critical component of an adequate environmental document. *See Santiago County Water District v. County of Orange*, 118 Cal.App.3d 818 (1981) (EIR inadequate because of failure to discuss construction of water delivery facilities in project description). The project description in this case is influenced by Public Resources Code section 21159, which provides the ***minimum*** requirements for an environmental analysis of a rule or regulation that requires the installation of pollution controls.[23] That statute requires certain state agencies to analyze the following:

> (1) An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.
>
> (2) An analysis of reasonably foreseeable feasible mitigation measures.
>
> (3) An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation.

PUBLIC RESOURCES CODE § 21159(a)

Response: Appendix R was reorganized to make clear where the items mentioned in this comment are located.

Comment 236

Thus, the methods of compliance are part of the project description because the impacts, mitigation measures, and alternatives to the methods of compliance must be analyzed.

With that in mind, it is easy to see that the project description in this case contained only a cursory discussion of the methods of compliance. The Technical Report for the TMDL states that the required reduction in pollutants may be achieved by education, street sweeping, storm drain cleaning, BMP inspection and maintenance, manure fertilizer management plans, buffer strips and vegetated swales, bioretention, infiltration trenches, sand filters, diversion systems, animal exclusion, and waste treatment lagoons (for manure storage). The TMDL document is devoid of evidence that suggests that the pollutant reductions required to achieve full compliance with the TMDL can be achieved

[23] The statute clearly states that these topics are the minimum requirements for an adequate environmental analysis; other impacts must be identified if the impacts are a direct result or a reasonably foreseeable indirect result of the project.

by anything other than: (1) diversion or (2) treatment. Treatment is required in hundreds of locations to maintain dry flows in order to maintain creek hydrology. Again, MS4 operators the City of Laguna Niguel and Orange County installed a treatment system in Aliso Creek that reduced bacteria levels by 99%. The Caltrans Retrofit Pilot Study (2004) found removal efficiencies of no greater than 79% when the influent contained moderate levels of fecal coliform (Attachment 3) Thus, it is reasonably foreseeable that operators will install treatment controls (UV, chlorine/dechlorination or ozone), necessitating an analysis of the environmental impacts. In accordance with the Regional Board's interpretation of the tributary rule, these treatment controls would need to be installed upstream of the storm drain outfalls. Because bacteria re-grows in storm drains, the controls would need to be located as close to the outfall as possible.

Response: We revised Appendix R to include analysis of environmental impacts from UV and ozone technologies. We did not discuss chlorination/de-chlorination because this process is primarily used for drinking water treatment. We do not think that this process would be used to treat urban and stormwater runoff because of difficulties associated with chlorine transport, storage, and corrosiveness.

The CEQA does not require the level of detail requested in the comment for a planning level analysis. The dischargers are responsible for determining the specific BMPs that will be implemented at specific locations, and for evaluating the potential site specific environmental impacts of those BMPs. Dischargers should consult available literature for determining BMP efficiencies.

Comment 237

Having identified the types of facilities that could be constructed to achieve compliance (diversion and detention/infiltration), Public Resources Code section 21159, subdivision (c) kicks in to specify the details of the analysis that is required in terms of environmental, technical, and specific sites. Thus, issues that must be included to properly address these considerations in the scope of this TMDL include:

a. The "tributary rule," which subjects all receiving waters within the affected watersheds to the TMDL. The application of this rule in complying with this TMDL creates an interesting overlay in that the TMDL does not define "receiving waters, yet the San Diego County Municipal Storm Water NPDES permit states that in some instances receiving waters and the MS4 are the same;

b. Topography, which prevents BMP works from being built on canyon walls below storm drain outfalls but above receiving waters that are subject to the WQO in the TMDL;

c. The structural BMPs need to capture and treat a very high percentage of storm water due to the large level of loading reduction required by the TMDL; i.e., it is not reasonable to expect that works located far from the storm drain outfalls would, by themselves, meet the TMDL because significant amounts of storm water run into the conveyance system immediately above the outfalls.

d. Locating works some distance from the receiving waters would be infeasible because it would be necessary to construct a new, separate conveyance system to prevent the treated water from mixing with untreated water.

e. The number of control devices that may be required to achieve compliance is a technical consideration in complying with the TMDL. Because the TMDL defines the maximum loads of bacteria that may flow into receiving waters without regard to the size of a rain event, loading must be controlled in all storm events. Accordingly, certain assumptions must be made with respect to the size of the storm in order to design structural BMPs that will provide adequate contaminant reduction. Lacking a "design storm," or information on soil infiltration rates, the Regional Board's CEQA analysis must include assumptions regarding a design storm size and the acreage of detention/infiltration facilities that would be needed (including any manufactured slopes). Information is available from the City of San Diego, the California Department of Conservation, and the United States Soil Conservation Service on soil infiltration rates that would be necessary in this analysis. For purposes of revising the CEQA analysis, the Regional Board could use the following estimates of the number of storm drain outfalls within the areas affected by the TMDL:

- the Chollas Creek watershed has approximately 816 storm drain outfalls within the City of San Diego,
- there are approximately 1,315 outfalls within the City of San Diego within the San Diego River watershed, and
- there are approximately 61 outfalls within 300 feet of the beaches identified in the TMDL.

The project description in the CEQA analysis is devoid of any discussion or analysis of these issues, and thus is inadequate because the failure to include this information prevented a meaningful analysis of the impacts of compliance.

As indicated in our letter on the Chollas Creek Metals TMDL, it is reasonably foreseeable that the TMDL implementation could require the City to build a large number of relatively smaller sized works in areas immediately behind a geologically-safe setback above all existing storm drain outfalls which have receiving waters immediately below them. In the Chollas Creek watershed, these works could occupy 1,387 acres – almost 10 percent of the 16,273 total acres in the watershed.

Response: The CEQA does not require the San Diego Water Board to designate a design storm or speculate on the number of control devices that the dischargers might construct. The CEQA does not require the San Diego Water Board to speculate on the specific locations where the dischargers might construct BMPs. Where BMPs can be constructed with regard to receiving waters, and the design storm issue, is discussed in the response to Comment 233.

Comment 238

CEQA Compliance – The Environmental Analysis Does Not Analyze the All Impacts Associated With Construction of Structural BMPs

Only when a meaningful discussion of the environmental setting is set forth and a thorough project description has been prepared can an adequate analysis of impacts and mitigation measures be prepared. *County of Inyo v. City of Los Angeles*, 71 Cal.App.3d 185 (1977). Here, the Regional Board has put itself in an "Catch-22." While the Regional Board contends that it is not reasonably foreseeable that treatment controls will be used as a compliance method, it nevertheless analyzed the impacts – albeit poorly – of diversion structures. Having analyzed some of the impacts to diversion structures, the Regional Board must ensure that the analysis is complete, and supported by substantial evidence. CEQA determinations related to quasi-legislative decisions must be supported by substantial evidence. *See* PUBLIC RESOURCES CODE § 21167.5; *Western States Petroleum Association v. Air Resources Board*, 9 Cal.4th 559 (1995).

Substantial evidence is defined in CEQA as:

> For the purposes of this section and this division, substantial evidence includes fact, a reasonable assumption predicated upon fact, or expert opinion supported by fact.
>
> Substantial evidence is not argument, speculation, unsubstantiated opinion or narrative, evidence that is clearly inaccurate or erroneous, or evidence of social or economic impacts that do not contribute to, or are not caused by, physical impacts on the environment.

PUBLIC RESOURCES CODE § 21080(e)

Response: New analysis, including mitigation of the construction of treatment controls, was added to the March 9, 2007 version of Appendix R. The expanded analysis addressed the concerns raised in the comment.

Comment 239

The following analyses in Chapter 12 and Appendix R are deficient because the conclusions are not supported by substantial evidence:

a. Aesthetics –

Appendix R states that the creation of structural BMPs can create adverse aesthetic impacts. The Regional Board's analysis of this impact states:

> Depending on the controls chosen, the project may result in the installation of urban runoff storage, diversion, or treatment facilities and other structural controls that could be aesthetically offensive if not properly designed, sited, and maintained. Many structural controls can be designed to provide habitat, recreational areas, and green spaces in addition to improving urban runoff water quality. In-creek diversions should not be used as controls, therefore, there should be no adverse impacts on aesthetics resulting from construction of concrete-lined basins or treatment facilities within creeks.

This analysis is legally inadequate because it does not state what constitutes a significant aesthetic impact and how designing the treatment works to serve as habitat, recreational

areas, or green spaces mitigates any adverse aesthetic impact, much less mitigating any significant, adverse impact below the level of significance. It addition, the analysis ignores the reasonably foreseeable size and location of the BMPs described above, the works would be too small and subject to too many edge effects to create sustainable habitat. Moreover, regular maintenance would require periodic removal of plant growth and sediments. Topographically, it is reasonable to assume that basins associated with the works will need to be excavated and that significant portions of the basins would consist of manufactured slopes, limiting recreational opportunities. Deeper infiltration basins could be built to reduce acreage requirements; however, maintenance needs would preclude the construction or re-construction above these vaults and pumps would be needed in areas of impermeable soil to convey overflows to treatment controls. Moreover, deeper equalization basins would not be able to take advantage of evaporation or evapotranspiration. Thus, the "analysis" is merely "speculation, unsubstantiated opinion or narrative" that does not support the conclusion that the listed impact will be reduced below the level of significance, and is not, therefore, supported by substantial evidence, as required by law.

Response: The levels of significance for aesthetic impacts were set at no long term impacts including among other considerations, no long term obstruction of any scenic vistas. New analysis of aesthetics was added to the March 9, 2007 version of Appendix R that expanded the previous discussion and addressed the City of San Diego's concern.

Comment 240

b. Air Quality –

Appendix R makes the following statement regarding Air Quality:

> The construction of structural controls might adversely affect air quality because construction might require the use of diesel fuel engines to operate equipment. Potential impacts are likely to be limited and mostly short-term in nature. Impacts may be mitigated through measures such as limiting hours and amount of construction, eliminating excessive idling when vehicles are not in use, limiting construction during periods of poor air quality, and/or using alternative fuel vehicles rather than diesel fuel vehicles. Any impacts to air quality, both short-term and long-term, would be subject regulation by the appropriate air pollution control agencies under a separate process.

This analysis is deficient because the analysis does not state what the threshold of significance for impacts to air quality from toxic air pollutants, nor does it have any basis for concluding that the programs implemented by air pollution control agencies will, in fact, reduce any impacts below the unstated threshold of significance. Thus, the "analysis" is merely "speculation, unsubstantiated opinion or narrative" that does not support the conclusion that the listed impact will be reduced below the level of significance, and is not, therefore, supported by substantial evidence, as required by law.

Response: The levels of significance for air quality impacts were set at no long term impacts including, among other considerations, no long term degradation of ambient air

quality or long term ongoing problems with odor which can not be remedied. New analysis was added to the March 9, 2007 version of Appendix R that expanded the previous discussion and addressed the City of San Diego's concern. Additionally, an analysis which includes the air quality impacts of street sweepers was added to the Checklist where the impact was determined to be less than significant with mitigation.

Comment 241

c. Biological Resources –

Appendix R states that there are potential impacts to riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service, but that those impacts would be reduced below the level of significance through mitigation.

The analysis does not state what sensitive species are located within the project area. It does not mention the San Diego County Multiple Species Conservation Plan – a regional plan that addresses impacts to sensitive species. The analysis that is done seems to assume that the only manner in which habitat or species can be impacted is through urban runoff flow diversion; even though the construction of treatment works could displace non-riparian species. Given the experience in Aliso Creek noted above, it is reasonable to assume that upland impacts may occur as a result of the need to intercept sheet flow runoff from canyon walls (immediately below developed areas) for treatment before these flows enter receiving waters. These interceptors would logically be located near and above the receiving waters - in areas where many canyons support native, upland vegetation and sensitive species. Impacts would result not only from construction of the diversions, but also from construction of treatment works and the associated pumps that would be necessary to put the treated water back into the receiving waters at a location near its diversion point.

Once again, the analysis does not contain facts, reasonable assumptions predicated on facts, or expert opinion based on facts; it is merely "speculation, unsubstantiated opinion or narrative" that does not rise to the level of substantial evidence.

Response: Although the analysis does not list the sensitive species in the watershed, this information can be obtained from a search of the California Natural Diversity database or through surveys of the specific location chosen for BMP construction. Thank you for bringing the San Diego County Multiple Species Conservation Plan to our attention. Dischargers should consult this plan if sensitive species are present at BMP construction sites.

That sheet flow from the urban areas flowing over canyon walls will need to be treated is not reasonably foreseeable. The volume of this flow will be small compared to flow from storm drain outfalls.

Comment 242

d. Cultural Resources –

Appendix R completely fails to address potential impacts to cultural resources. There is ample evidence available from local land use agencies about the location of cultural resources in San Diego County.

The affected watersheds are located in parts of San Diego that are designated as "Urbanized" or "Urbanizing" by the City's Progress Guide and General Plan because they are fully developed or in the process of being developed. Many structures within the watersheds were built prior to 1960, making them at least 45 years old and thus potentially significant historic resources under the criteria in 14 C.C.R. section 15064.5(a)(3)(C). Thus, with regard to checklist item V(a), the loss of an undetermined number of significant historic structures (located above storm drain outfalls/tributaries) should be considered a potentially significant effect.

With regard to checklist item V(b), it is generally accepted by land use agencies that because many older structures were built prior to or without the benefit of heavy earth-moving equipment, the soils underneath older structures have the potential to contain potentially significant archaeological resources. Therefore, the excavation of soils under potentially significant historic resources should be considered to have a potentially significant effect on archaeological resources.

Response: New analysis on potential impacts to cultural resources was added to the March 9, 2007 version of Appendix R to address the concerns in the comment.

Comment 243

e. Hydrology and Water Quality

Appendix R states that the diversion of storm flows and dry weather urban runoff would cause impacts to existing drainage patterns, but concludes that any such impact would be less than significant because "diversion of the entire stormflow of a creek is not required to meet wasteload allocations."

This statement is not supported by facts, reasonable assumptions predicated on facts, or expert opinion based on facts. There is no technical way for an MS4 operator to ascertain what percentage of a storm flow must be diverted for a particular storm to ensure that the pollutant loads do not exceed the wasteload allocations. If treatment is necessary, all storm flow must be detained and treated to ensure that the standards are met. Thus, the conclusion that this impact will be less than significant is ; "speculation, or unsubstantiated opinion" that does not rise to the level of substantial evidence.

Response: New analyses on potential impacts to hydrology and water quality were added to the March 9, 2007 version of Appendix R, which addresses the concerns in the comment.

Comment 244

f. Geology and Soils –

Appendix R concludes that there will be no impacts to Geology and Soils. This conclusion is no supported by substantial evidence.

Excavating infiltration works in the vicinity of canyon rims has the potential to make canyon walls unstable (only basins serving an equalization purpose could be lined). Increasing infiltration increases instability even if the slope in question is already engineered. For slopes that aren't engineered (and this is the case in older neighborhoods – see above), this instability can lead to failure. Increasing the integrity of slopes downhill of detention works could also result in increased impacts to biological resources or, if retaining walls are used, aesthetic impacts. Therefore, as a result of the project change, checklist item V(c) should indicate that the geology impact from the project is potentially significant.

For purposes of revising the CEQA analysis, we suggest that the Board consider that works which involve any level of infiltration be setback from a canyon rim such that a 45 degree line drawn from the bottom of the basin nearest the canyon rim does not intersect the canyon wall.

Infiltration or treatment of runoff will remove all sediment loading from the creeks. What is the impact of this on the creeks and downstream beaches?

In accordance with Section 15126.2, the Regional Board must consider the impacts of the environment on a project as well as the impacts of a project on the environment. Therefore, in concluding that infiltration can play a major role in implementing the TMDL, the Regional Board should, programmatically and on a site-specific basis, evaluate the permeability of soils within the areas affected by the TMDL.

Similarly, many formational materials within the watersheds are fossiliferous (Kennedy, 1977). Therefore, given that excavation of detention works could penetrate through surficial soils and into ungraded formational materials, the response to checklist item V(c) should indicate that this impact is potentially significant.[24] Because the environmental analysis does not discuss impacts to these resources or propose mitigation measures, the environmental analysis is inadequate.

Response: New analyses on potential impacts to geology and soils were added to the March 9, 2007 version of Appendix R, which addresses the concerns in the comment.

Thank you for the comment concerning potential fossil finds. Additional discussion on impacts and mitigation has been added to explanation of the answer to question 20 (Archeological/Historical).

Comment 245

g. Land Use and Planning –

[24] The "Kennedy Maps" are maps of geologic formations that may contain specific paleontological resources, and are specifically used by planning and land use agencies to identify the potential for significant paleontolgical resources. Such resources occur within the City of San Diego, and therefore could occur within the Chollas Creek watershed. *See* Geology of the La Jolla, Del Mar, La Mesa, Poway, Point Loma, and Southwest Quarter of the Escondido Quadrangles, San Diego County, California, by Michael P. Kennedy, 1975; and Geology of National City, Imperial Beach, and Otay Mesa Quadrangles, Southern San Diego Metropolitan Area, California, by Michael P. Kennedy and Siang S. Tan, 1977.

Checklist Item IX(b) indicates that the project would not conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for purposes of avoiding or mitigating and environmental effect." This conclusion is not supported by substantial evidence; substantial evidence supports the opposite conclusion. The following examples are taken from the Chollas Creek watershed; a similar analysis should be made of all watersheds.

First, while the Regional Board's environmental analysis foresees the need to construct works, because no analysis was done on the required number or location of treatment works, the analysis does not discuss the need for the City to acquire and demolish hundreds of acres of developed land uses in order to construct the works. This is inconsistent with the only listed impact in the draft environmental analysis, where Regional Board staff discusses the impacts from operating a works that detains water – the works has to be constructed before it can be operated. Because the Regional Board did not properly analyze this impact, the Regional Board's analysis incorrectly concludes that the impacts will be less than significant or that they can be mitigated to below the level of significance. This conclusion is incorrect because it does not consider the following:

Housing

The Housing Element of the City's adopted General Plan and the position taken by the City Council when declaring a "Housing State of Emergency" both have as a basic objective an increase in the housing supply. According to Appendix E of the Technical Report, low and high density residential uses account for almost 64% of the land uses within the Chollas Creek Watershed. On average, this means that 64% of the 480-1400 acres if land that would be occupied by treatment works (307 to 896 acres) is currently developed with homes. Assuming an average of 10 dwelling units per acre (4,000 square foot lots are common in the watershed), this equates to the loss of 3,070 to 8,960 units. Removal of this number existing dwelling units would decrease the housing supply and is thus in conflict with adopted City policy.

Industrial Land

The Industrial Element of the City's adopted General Plan states that there is a serious shortage of large parcels suitable for industrial development exists in the City. Related goals and recommendations include:

"Insure that industrial land needs as required for a balanced economy and balanced land use are met consistent with environmental considerations" (p.286)

""Protect a reserve of manufacturing lands from encroachment by non-manufacturing uses." (p. 286)

"As mentioned earlier, in allocating additional land for industrial use it is imperative that sufficient acreage be designated to meet projected needs so that the existing market can operate effectively." (p.287)

The general theme of the existing Industrial element is precisely this shortage of industrial land, high industrial and prices, etc. and how the economy is negatively

affected by the non-industrial use of industrial land. The supply increased only slightly since 1979 and has not increased since. In fact it is now at crisis level proportions.

According to Appendix E of Region 9's Technical Report, low and high density residential uses account for 3.12% of the land uses within the Chollas Creek Watershed. On average, this means that 3.12% of the 480-1400 acres of land that would be occupied by treatment works (15 to 43.7 acres) is currently developed with industrial uses.

The removal of housing and industrial acreage from the City's stock in order to build storm water treatment works required to comply with the TMDL would conflict with the City's General Plan and its declared Housing State of Emergency. Therefore, as a result of the project change, checklist item IX(b) should indicate that the Land Use and Planning impact from the project is potentially significant with respect to the loss of residential and industrial lands. The environmental analysis in inadequate because it failed to analyze this impact.

Given that none of the City's land use plans identify storm water treatment works and the nature of detention/infiltration works, the City believes that land use impacts would be significant and suggests that the Regional Board evaluate the City's plans to determine where and the extent to which inconsistencies would result.

h. Population and Housing –

Checklist item XII(c) indicates that there would be no displacement of substantial numbers of people, necessitating the construction of replacement housing elsewhere. Within the Chollas Creek watershed alone, the number of dwellings that would be lost as a result of the project change (3,070 to 8,960) should be considered substantial. According to U.S. Census Data, the average dwelling unit in San Diego houses 2.6 people. The loss of 3,070 to 8,960 dwelling units would therefore result in the displacement of 7,982 to 23,296 people. This number of dwellings that would be lost as a result of the project change should be considered substantial. Therefore, as a result of the project change, checklist items XII (b) and XII (c) should indicate that the Population and Housing impact from the project is potentially significant.

The City believes that this is in and of itself a significant impact and suggests that the Regional Board conduct a similar impact evaluation in all of the watersheds that would be subject to the TMDL.

Response: The City based the sizing of the BMP equalization basins on a 3 foot depth, neglecting to analyze deeper equalization basins in order to avoid securing a dam permit (Weston, 2006).[25] Based on the decision not to secure dam permits, the City then concluded that private property must be condemned and demolished to make room for the large, shallow equalization basins. If equalization basin are required, the City could secure dam permits and design the basins deep enough to avoid condemnation and demolition of private property.

[25] Weston Solutions, Inc. Chollas Creek TMDL Source Loading, Best Management Practices, And Monitoring Strategy Assessment, Final Report, September 2006.

Comment 246

i. Utilities and Service Systems –

Checklist item XVI (c) indicates that the project will not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. This is directly contradicted by the Technical Report, and given that the project change causes the additional significant impacts cited above, there is even more reason why this item should indicate that the Utilities and Service Systems impact from the project is potentially significant.

Response: New analysis on potential impacts to utilities and service systems was added to the March 9, 2007 version of Appendix R in response to this comment.

Comment 247

Given that the project change will result in previously undisclosed significant effects, CEQA compliance to date has deprived interested parties the opportunity to provide meaningful comment. In particular, we suggest that opportunity to comment be provided to historic preservationists, housing advocates, industrial developers, and those interested in public policy as it pertains to preservation of San Diego's shrinking supply of industrial lands.

Response: Although we disagree that TMDL implementation will result in significant environmental impacts from the loss of housing, industrial lands, or cultural resources, two additional comment periods were provided since the City offered the above comment. All interested persons have had ample time to respond to the changes and new analysis in the Technical Report and supporting documents.

Comment 248

Regional Board staff has, in the past, stated that it need not conduct a detailed analysis because it contends that the TMDL environmental analysis functions as a "first tier document," or would be speculative These statements are inaccurate because:

- Tiering does not excuse the lead agency from adequately analyzing the reasonably foreseeable significant environmental effects of the project and does not justify deferring such analysis to a later tier EIR or negative declaration." 14 C.C.R. Section 15152(b).
- Lead agencies cannot hide behind an inadequate analysis and leave it to the public to produce the necessary substantial evidence regarding adverse impacts. *Gentry v. City of Murietta*, 36 Cal.App.4th 1359, 1379 (1995). While foreseeing the unforeeable is not possible, the agency must find out and disclose all that it reasonably can. 14 C.C.R. § 15144.
- To claim that an impact is speculative and terminate a discussion requires analysis – it does not excuse a failure to investigate and analyze. *See Marin Municipal Water District v. KG Land California Corporation*, 235 Cal.App.3d 1652 (1991)

and 14 C.C.R. Section 15145. The record does not support a finding that the Regional Board has conducted this investigation

Response: Please see the response to Comment 231.

Comment 249

CEQA Compliance – The Regional Board Has Not Analyzed the Cumulative Impacts of All Proposed TMDLs.

CEQA requires that cumulative impacts be assessed as part of determining whether a project may have a significant effect on the environment (CEQA Guidelines Section 15064(h)(1). A Lead Agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan (CEQA Guidelines Section 15064(h)(3). However, Section 15064(h)(3) also requires preparation of an EIR (meaning a finding that the cumulative impact is significant) if there is substantial evidence that the possible effects of a particular project are still cumulatively considerable, notwithstanding that he project complies with the specified plan. Cumulatively considerable means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects."

The initial study checklist indicates that cumulative impacts from the project will not occur, but no rationale is provided for that conclusion. CEQA Guidelines Section 15130(b) describes alternative lists of projects and projections that an agency is required to consider when evaluating significant impacts. Given that the Regional Board has a mandate to adopt TMDLs for receiving waters on the 303(d) list, the checklist should, at a minimum, consider the impacts of this project in the context of impacts that would result from reasonably foreseeable means of compliance with other TMDLs, such as the recently adopted TMDL for metals in Chollas Creek (see the attached letter from Deputy City Attorney Tim Miller to the State Water Resources Control Board regarding the Chollas Creek Metals TMDL for the impacts expected to occur from that project). Moreover, the analysis should include the impacts from TMDLs that are in various stages of consideration, adoption, or implementation throughout all the affected watersheds, including the Chollas Creek Dissolved metals TMDL, and – to the extent this TMDL affects the Scripps watershed – State Board activities related to discharges into Areas of Special Biological Significance.

Response: The discussion of cumulative impacts was revised in the March 9, 2007 version of Appendix R.

Comment 250

CEQA Compliance – Chapter 12 and Appendix R Are Inconsistent:

Appendix R concludes that all listed impacts are either insignificant, or can be mitigated below the level of significance. Nevertheless, Chapter 12 contains a statement that some impacts may not be mitigated below the level of significance, but that the goals of the

Clean Water Act override these impacts. As noted previously, all findings must be supported by substantial evidence. To the extent that Appendix R and Chapter 12 conflict, one of the two conclusions is not supported by substantial evidence.

Unless mitigation to reduce potentially significant impacts to a level below significance is "guaranteed", the analysis must conclude that the impacts are significant (CEQA Guidelines, Section 15152(f)(3). In that case, "Findings" and a "Statement of Overriding Considerations" must be adopted.

Response: Although the San Diego Water Board found that all potentially significant impacts could be reduced to less than significant with mitigation, we nonetheless incorporated a finding and statement of overriding consideration in the Technical Report and Resolution. It was incorporated because the San Diego Water Board may not have approval authority over specific implementation projects and therefore, cannot ensure that mitigation will be incorporated when the projects are built.

Comment 251

Here the only alternatives analyzed are the "no action" alternative, and the "reference system approach." This is an inadequate range of alternatives. *See Citizens of Goleta Valley v. Board of Supervisors*, 52 Cal.3d 553 (1990)[Requiring a reasonable range of feasible alternatives.

Here, the Regional Board has failed to explain why setting the TMDL to a higher level is not a feasible alternative. Such an alternative may still result in Basin Plan compliance; however, the reduced need for BMP acreage would preserve more existing land uses, effectively mitigating (partially) the significant impacts to existing land uses. Alternatively, the environmental analysis should describe why such an alternative will not achieve the basic purposes of the project.

Another alternative that has not been addressed is, to the extent that the implementation plan is part of the project, whether a longer compliance schedule will result in pilot project technology becoming mainstream technology that can be deployed and reduce certain impacts.

Response: As stated in several places in the Technical Report, TMDLs must be based on WQOs established in the Basin Plan and Ocean Plan. Therefore the TMDLs cannot be arbitrarily raised to a higher level. However, we anticipate adoption of the reference system/natural sources exclusion approach Basin Plan amendment well before dischargers must meet final TMDLs. This Basin Plan amendment will result in higher TMDLs. The water quality standards alternative was added to the March 9, 2007 version of Appendix R. Whether or not pilot technology will become mainstream within a longer compliance schedule is too speculative to be a plausible alternative.

Comment 252

Appendix R, Environmental Checklist page R-14. Item 10 Risk Upset. We recommend that structural controls such as bioretention BMPs or waste treatment lagoons could have the potential for major failures that result in release of wastes into surface waters. These

should be listed as less than significant with mitigation or significant impact depending on the volume of the wastes that are released during the upset. Upsets could be caused by unusually high rainfall causing a breach of the containment structure or poor design and/or construction.

Response: Item 10-Risk Upset in the checklist specifically refers to hazardous wastes, which does not include wastes from treatment lagoons. In regards to impacts from upsets due to episodic rainfall events, we considered them to be less than significant because overflow would not occur in a properly designed pond unless the rain event exceeded the 25-year, 24-hour storm. Since a storm exceeding this size is extremely rare, we considered this impact to be less than significant.

Comment 253

The Regional Board is required to prepare environmental analyses for the TMDLs to assess the impacts of implementing a reasonable range of alternative means of compliance. By understating magnitude of structural treatment facilities needed to comply with the TMDLs, the City believes that the existing environmental analysis does not fulfill the Regional Board's obligation under CEQA.

Response: Please see the response to Comment 238.

Comment 254

In summary, construction of hundreds of acres of structural treatment facilities, in conjunction with maximizing infiltration opportunities, will be necessary to comply with the required bacteria and metals load reductions. No evidence has been presented by anyone to suggest that solutions other than infiltration/diversion or treatment of entire rain events can result in compliance. The TMDLs allow no exceedences of load reductions regardless of storm size or duration; therefore, regardless of the treatment mechanism selected (grass swales, retention, biofiltration, sand filters, etc.), treatment facilities will need to incorporate acreage-intensive detention/equalization facilities because storm water cannot be treated as fast as rain falls from the sky – certain contact times are required. The significant impacts to existing development from construction of these treatment and equalization facilities has been previously documented and was calculated based allowing one exceedence every three years. The City suggests that the TMDLs include an exceedence frequency and that the Regional Board's environmental analysis include an analysis of the acreage required for treatment based on the exceedence standard. What storm size or exceedence frequency was used by Regional Board staff to calculate the costs of implementing the TMDLs?

Response: The evidence, in the form of the Weston report, submitted by the City outlines some of the challenges which will be faced in complying with the metals TMDLs in Chollas Creek. However, the Weston report presented very few options as solutions to the challenges. Securing dam permits (to increase basin depth and decrease basin size) may be more reasonable than private property demolition to make room for large equalization basins.

No storm size or exceedance frequency was used to estimate the cost of implementing the TMDLs. Estimates in the substitute environmental documents were generated utilizing observed annual stormwater volumes in the watersheds. Base on the average volume, a cost to treat the entire annual volume was determined. This annual cost was divided by ten as a broad and convenient tool to aid dischargers in estimating the total required cost based on the 10th portion of the urbanized watershed needing treatment. For example, if the discharger determines that 36 percent of the urbanized watershed will require treatment, then the cost based on the 10th portion can be multiplied by 3.6 to obtain as reasonable cost estimate. Please see section 7 (Economic Factors) of Appendix R, of the Technical Report, for additional details.

Comment 255

The environmental analyses for both TMDLs identifies as a reasonably foreseeable means of compliance the diversion of dry weather flows to infiltration or sanitary sewer facilities. The current environmental analyses analyze the effects of this compliance mechanism on native, downstream wetland vegetation which is dependent upon these flows; however, the conclusion regarding the significance of this impact is not clear. Overall, the conclusion seems to be that the loss of wetland vegetation which would occur after dry weather flows are diverted is less than significant because remaining and replacement vegetation would be more similar to that which persisted prior to development (i.e., native, upland vegetation). This conclusion that the loss of wetland vegetation is not significant is inconsistent with State policy and the Regional Board's own 401 certification requirements. Have trustee agencies such as the California Department of Fish and Game were consulted on this conclusion? The City suggests that this issue be clarified in revised environmental analyses.

Response: Wetland vegetation dependant on nuisance flows in the watersheds is likely not "native." The San Diego Water Board 401 requirements derive from the Army Corp of Engineer's 404 certification requirements. The San Diego Water Board, as a certifying agency for the 404 program, has broad leeway in certification and mitigation requirements. Ensuring nuisance flow dependant non-native pest species plant propagation is not consistent with the San Diego Water Board 401 requirements.

The decrease in stream flow may result in a change in the plant communities found in and near each stream. A decrease in plant diversity or abundance may occur by reducing the number of species that require a more constant water supply. However, many of these plant species may be non-natives to Southern California, and most likely would not provide habitat or a food source for native wildlife. Native plant species that previously thrived in the stream corridor may naturally repopulate the areas that are currently occupied by invasive species. Increased diversity or area of native plant cover also could be accomplished through restoration/ mitigation projects within the stream corridor. Regardless of the method, the opportunity for restoration/ enhancement of the stream corridor to pre-development conditions is realistic.

Scientists from the U.S. Fish and Wildlife Service (USFWS)[26], and the California Department of Fish and Game (DFG)[27] were contacted regarding this subject. The DFG stated that the action could be a possible concern to the DFG, depending upon each case. They would become involved in the process in cases where a streambed alteration agreement was needed or during the comment period for CEQA. The USFWS stated that reduction of contaminant loading to the streams would be beneficial; however, reduced stream flow could result in the loss of aquatic and riparian habitat (depending upon the amount of flow reduced). They would consider project impacts on a case by case basis.

Comment 256

Page R-5/page 4 of the environmental analysis for the Bacti-1 TMDL/Chollas Dissolved Metals TMDL indicate that the environmental analyses do not require an examination of every site but a reasonably representative sample of them. Please describe the sample set of sites that were examined in the analyses.

Response: The substitute environmental documents evaluated specific sites where BMPs could be located, in each of the major land use types in the watersheds, including residential, industrial, commercial, roadways and open space land uses. Please see section 6 (Reasonably Foreseeable Methods of Compliance at Specific Sites) of Appendix R.

Comment 257

While both environmental analyses note where treatment BMPs should not be built (on Prime Farmland, in special status species habitat, in areas developed with privately-owned land uses), neither analyses identifies where treatment BMPs could reasonably be built. This listing of suitable locations is critical to a determination of whether construction of treatment facilities would result in significant impacts.

Response: Avoidance is a standard mitigation measure, thus the analysis discusses where treatment BMPs should not be built. The San Diego Water Board is not required to speculate on where the discharger may or may not choose to construct BMPs. However, in discussing potential impacts, we considered constructing BMPs in all land use types.

Comment 258

Page R-19/page 15 of the environmental analyses for the Bacti-1/Chollas Dissolved Metals TMDLs indicate that short term construction impacts are not considered to be potentially significant. Why are these impacts considered less than significant on these pages and answered "less than significant" in the discussion section when mitigation measures, in the form of mufflers and lighting plans are recommended?

Response: Thank you for the comment. The designation "less than significant" has been changed to "less than significant with mitigation" in Appendix R.

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[26] Katie Zeeman, USFWS, personal communication, March 8, 2007.
[27] Kelly Fisher, DFG, personal communication, March 7, 2007.

Comment 259

Please clarify the significance determination for changes in native flora and fauna that would result from diverting dry weather flows from storm drain outfalls where the flora and fauna are dependent upon dry weather flows.

a. How would the loss of dry weather flows and the concurrent loss of wetland vegetation affect the habitat-related beneficial uses in the receiving waters?

b. How would the loss of native and vegetation due to diversion of dry weather flows affect temperature in the receiving water?

Response: The significance thresholds used to assess potential impacts to plants and animals are as follows: 1) No net reduction in native or beneficial (high value) plant species. 2) No net loss of number of plant species or area of natural pre-development habitat. 3) No barriers to native or high value plant communities and no introduction of non native species. 4) No net loss of native or beneficial animal species. 5) No deterioration of high value beneficial animal habitat compared to current conditions.

A reduction or loss of dry weather flows may affect the present habitats found in the watersheds. Wildlife use of the creeks as a drinking water source may be impacted with flow reduction; however, improvements in the water quality of the remaining water in the streams should be beneficial to wildlife.

A decrease in the flow volume and flow duration during dry weather conditions most likely would return the stream ecosystem to a more natural, pre-development condition, which may include a reduction in total plant biomass, a change in the plant diversity (increase or decrease), or a decrease in certain non-native or invasive plant species.

The changes in plant species could positively or negatively impact wildlife. Loss of invasive or non-native plant species will allow space for native plant species to grow. The native wildlife species are adapted to the native plant communities which comprise wildlife habitat. They use the plant community for food and shelter for themselves and indirectly as food and shelter for their prey. In addition, the opportunity for restoration/enhancement of native plant species could be developed to benefit wildlife. If native plant communities naturally do not overtake the areas where biomass was lost, then restoration efforts should be considered.

A detailed explanation of how plant and animal species may respond to changes in stream flow during dry weather can be found in Appendix R, in the explanations to questions 4a and 4d.

Summertime dry weather flow in the watersheds that existed before extensive urban development in the watershed likely was supported by groundwater seepage into the channel. Since there is no groundwater development in the watersheds to lower the water table, dry weather base flow from groundwater seepage is likely to be at or higher than under pre-development conditions, due to a rise in the groundwater table from irrigation water recharge. Eliminating nuisance flows should not alter the dry weather flow in the watersheds due to groundwater seepage. Thus, stream reaches with perennial stream flow and riparian or wetland habitats should not diminish below pre-development levels.

Assuming that some flow remains in the streams, loss of vegetation may affect the stream temperature in two ways: by reducing canopy cover (if the vegetation lost is tall enough to shade the stream), or by reduction in flow from evapotranspiration. Vegetation that provides canopy cover will shade the water thereby preventing an increase in water temperature due to direct sunlight. Similarly, the shading will reduce the amount of evaporation in the stream, thereby maintaining a lower water temperature. Conversely, vegetation in and near a stream will absorb water from the stream or water table, which would then reduce the amount of water in a stream and increase water temperatures.

These temperature effects from reduced flows will be less than significant for the creeks because pre-development conditions would not provide aquatic habitat during the dry season, and therefore, instream habitat would naturally be minimal or nonexistent during the dry season. Presently, species native to San Diego and Orange County may occur in the creeks, but would not occur without anthropogenic sources. Net loss of native habitats or loss of species diversity will not be tolerated, as defined by the significance thresholds in the first paragraph of this response. Mitigation is expected for any losses that may occur due to this project.

Comment 260

Mitigation measures in the environmental analyses for both TMDLs specify maintaining dry weather flows for purposes of maintaining certain animal populations. What is the reasonably foreseeable means for maintaining these flows given that the flows must also comply with the WLAs?

Response: In the March 9, 2007 version of Appendix R, we did not identify maintaining dry weather flows as a mitigation measure. We did not find impacts associated with elimination of dry weather flows.

Comment 261

Both TMDLs provide cost estimates for compliance using a variety of structural and non-structural BMPs based on data from EPA and CASQA. What is the design storm or exceedence frequency assumed in the cost estimates listed? In one example, page 70 of the environmental analysis for the Chollas Creek Dissolved Metals TMDL refers to treating 29,072,731 cubic feet of storm water, referring to this quantity as an annual "average". However, the TMDLs do not limit compliance to an average year. How does the lack of a design storm/allowable exceedence frequency affect the cost calculation?

a. Both environmental analyses reference the costs and effectiveness of Caltrans' BMPs. What was the storm size that the Caltrans BMPs were designed to and are they effective in wet weather. If they are effective in wet weather, please extrapolate the acreage required for the BMP and its equalization facilities to give a fair representation of the acreage required in the watersheds affected by the TMDL.

Response: The cost estimates were based on average annual measured flow volumes for the watersheds. Until a design storm is selected, the average and design storm cannot be compared.

The Caltrans BMPs referred to above were not extrapolated into BMP acreage requirement because of the potential variability in BMP design. However, all construction related adverse environmental impacts and mitigation has been provided. Please also see the response to Comment 254.

Comment 262

Given known data regarding water quality in the affected watersheds, what approximately is the percentage of a typical storm event that would need to be treated in order to comply with the TMDL? In other words, would "first-flush" treatment likely achieve loading requirements throughout a typical storm?

Response: CEQA does not require this level of detail. For a discussion on design storm please see the response to Comment 233.

Comment 263

In discussing impacts to population and housing, the environmental analyses for both TMDLs recommends evaluating and implementing more reasonable alternatives such as nonstructural BMPs and low impact and/or small scale structural BMPs before considering an alternative that would create considerable hardship for the community in the area. This is what the City proposed in its September, 2006 correspondence; however, the City concluded that such efforts would most likely not result in compliance. Please expand on how the Regional Board envisions that this means of compliance would roll out given the interim compliance goals.

Response: If the dischargers choose this BMP approach, how it would roll out depends on how quickly the dischargers conduct feasibility studies, select sites for implementation, and secure financing for construction. If this approach does not result in compliance, the City of San Diego would have to combine this approach with other BMP alternatives.

Comment 264

Page R-61/page 57 of environmental analyses for the Bacti-1/Chollas Dissolved Metals TMDLs indicates that the analyses do not analyze all possible means of compliance because alternative means of compliance consist of the different combinations of BMPs that dischargers might use and there are innumerable ways to combine BMPs. The preceding is correct in that the analyses not include combinations of BMPs that are not expected to result in compliance with the WLAs in the TMDLs. However, the analyses unfortunately do not list any single BMP or combinations of BMPs that 1) are documented to result in the required load reductions and 2) will not have significant impacts by displacing existing development. Please list a single combination of non-

structural and less-intensive BMPs that will result in compliance with the Bacti-1 TMDL and, for the Chollas Creek watershed, both TMDLs.

Response: The substitute environmental documents contain sufficient information and analysis for the public to understand the potential adverse environmental impacts of the project, including the impacts from any possible combination of BMPs, and to provide the San Diego Water Board with meaningful discussion and comment on these impacts. The CEQA does not require the level of detail requested in the comment for a planning level analysis. The dischargers are responsible for determining the specific BMPs that will be implemented at specific locations, and for evaluating the potential site specific environmental impacts of those BMPs.

Comment 265

Why is there such a large discrepancy between the cost estimates in the Chollas Creek watershed to comply with the two TMDLs (Tables R-3 and I.2)? As suggested previously, the environmental analyses for the TMDLs should address the cumulative effects of both TMDLs (in terms of cost insofar as such an analysis is required, but certainly in terms of environmental impacts).

Response: Cost discrepancy between Tables R-3 and I.2 come from utilizing different sources for cost reference. Cost estimates can differ significantly. For example, a sand filter built by Caltrans is much more robust in design and construction (therefore more costly), compared to a small sand filter retrofit for a city street. Where the same sources were utilized in the two tables (i.e., diversion structures), the cost indicated for Chollas watershed are identical.

Comment 266

Page R-6 of the environmental analysis for the Bacti-1 TMDL states that the adoption of a TMDL is not discretionary; rather, it is compelled by section 303(d) of the federal Clean Water Act.

a. If adoption of the TMDL is not discretionary, why is the Regional Board preparing CEQA documentation for the action? CEQA compliance is only required if an agency proposes a discretionary action.

b. Why is the Bacti-1 TMDL being proposed for beaches that are not currently on the 303(d) list? On March 13, 2007, the US Environmental Protection Agency (EPA) partially approved the 2004-2006 303(d) List of Impaired Waterbody Segments. This list included the removal of 12 Scripps HA (906.30) ocean beaches. These beaches have not been removed from the TMDL for Indictor Bacteria Project 1. The City is requesting that these beaches be removed from this TMDL. The Clean Water Act, 40 CFR Section 131.38 has provisions for toxic pollutants to remain on the list for subsequent listing cycles; however, bacteria is not a toxic pollutant and has not met this criterion.

Response (a): The CEQA requires an environmental analysis of reasonably foreseeable environmental impacts of the methods of compliance with the proposed activity, which is

the Basin Plan amendment. Since the TMDLs are adopted as part of a Basin Plan amendment, a CEQA analysis is required.

Response (b): Please see the response to Comment 190. Additionally, the CFR was not referenced in this project.

Comment 267

Why does the Bacti-1 environmental analysis not recognize that storm water treatment via ozonation, ultraviolet radiation, reverse osmosis, or chlorination/de-chlorination are reasonably foreseeable means of compliance? The City is aware of no evidence to suggest that compliance with the zero WLA for bacteria can be achieved by any other treatment method.

a. Please provide references for any BMP that indicates that any BMP will achieve compliance with the TMDL – that they are 100% effective under all storm conditions or the prescribe storm conditions.
b. Please provide references for the BMPs that are listed in the environmental analysis that would indicate that these BMPs would result in compliance with the final WLAs.

Response: We revised Appendix R to include analysis of environmental impacts from UV and ozone technologies. We did not discuss chlorination/de-chlorination because this process is primarily used for drinking water treatment. We do not think it is reasonably foreseeable that this process would be used to treat urban and stormwater runoff because of difficulties associated with chlorine transport, storage, and corrosiveness. We did not include an analysis of reverse osmosis because this technology is not effective for removing bacteria. Please see the response to Comment 236 for the discussion of the requested references.

Comment 268

Please identify the Lead and, if they exist, the Responsible and Trustee Agencies (all as defined by the California Environmental Quality Act) associated with this project.

Response: The San Diego Water Board is the Lead Agency. There are no Responsible Agencies. The Trustee Agencies are:

(a) The Department of Fish and Game with regard to the fish and wildlife of the state;

(b) The State Lands Commission with regard to state owned "sovereign" lands such as the beds of navigable waters and state school lands;

(c) The State Department of Parks and Recreation with regard to units of the State Park System; and

(d) The University of California with regard to sites within the Natural Land and Water Reserves System.

Comment 269

The City continues to request that the Regional Board explicitly recognize in its CEQA documentation that treatment and/or diversion (e.g., via infiltration) of storm water will be required to comply with the proposed load reductions given the ubiquitous, legal, and uncontrollable sources of the pollutants. While Board staff has taken a step closer to doing this by listing these strategies as reasonably foreseeable, the impact analysis of this construction is inadequate.

Response: Our level of analysis, in the substitute environmental documents, is sufficient to disclose the level of impacts of the project and provide a forum for meaningful public discussion and comment on those impacts, including the impacts from any possible combination of BMPs. CEQA does not require the level of detail requested in the comment for a planning level analysis. The dischargers are responsible for determining the specific BMPs that will be implemented at specific locations, and for evaluating the potential site specific environmental impacts of those BMPs.

Comment 270

The City continues to request that the Regional Board provide specificity on how compliance will be evaluated in terms of the number of Notices of Violation and/or fines that dischargers would be subject to if compliance is not obtained (e.g., one fine per outfall per day, one fine per tributary, one fine per gallon). I am pleased that the compliance issue with regard to where compliance would be measured (e.g., at storm water outfalls and/or locations downstream) as described in number 5 below.

Response: The specificity requested in this comment is not necessary for adoption of TMDLs, and is better addressed upon re-issuance of the implementing order, as described in the response to Comment 147.

Comment 271

The City continues to request that the Regional Board dictate a design storm or allowable number of exceedences in the Bacteria-1 TMDL. Such an allowance is now recognized as at least a planning goal in the Chollas Creek Dissolved Metals TMDL as one exceedence every three years since this frequency is allowed by the California Toxics Rule; however, the Bacteria-1 TMDL provides no such guidance from the state or federal government. Without this direction, the City is unable to design with certainty towards compliance its treatment and infiltration facilities and the Regional Board is unable to evaluate the environmental impacts of building the facilities. Moreover, since the Technical Report for the Chollas Creek Dissolved Metals TMDL indicates that 99.7% of the metals loading occurs during wet weather (page 35) and since the bacteria TMDL allows for zero anthropogenic-related bacteria, it is clear that treatment and/or infiltration of wet weather flows will be essential to compliance.

Response: Please see response to Comment 233.

Comment 272

The City has prepared a reasonable 'Tiered" approach to implement the TMDLs. The approach entails implementing, as experiments, various combinations of non-structural BMPs, and structural BMPs on public property and voluntary incentive programs for private property owners. The goal of this part of the approach is to 1) determine whether, contrary to existing data, widespread treatment and/or infiltration of storm water is not required to comply with the TMDLs and 2) determine the maximum effectiveness of these Tier I and II in order to minimize the impacts of constructing Tier III (infiltration and treatment) BMPs on developed and privately owned land. The City requests that the Regional Board commit to a formal re-evaluation provision in the TMDL to that final load reductions and compliance strategies can be re-assessed after collecting data from Tier I and Tier II efforts.

Response: The San Diego Water Board cannot commit to a formal re-evaluation of the TMDLs for the reasons discussed in the response to Comment 58. However, bacteria TMDLs will be recalculated immediately after the adoption of the reference system/natural sources exclusion approach Basin Plan amendment. The implementation plan and compliance schedule were revised to commit the San Diego Water Board to considering the reference system/natural sources exclusion approach within 1 year of the effective date of the TMDL Basin Plan amendment.

Comment 273

Regional Board staff has made a number of statements (referenced in previous comments) which provide a de facto prohibition on building treatment or infiltration works below storm drain outfalls for purposes of complying with the TMDLs. The City asks that the Regional Board formally state its position on where BMPs can be located to comply with these TMDLs.

Response: Please see the responses to Comment 233.

Comment 274

"Potential structural BMPs include the installation of storm drain filter sacks, which require routine maintenance". Please clarify what a "storm drain filter sack" is and provide documentation of its effectiveness in treating bacteria. The City is intrigued by this product, as we have been aggressive pursuing effective methods of reducing bacteria in the creeks and beaches within our City and have found that effective solutions to treat bacteria are difficult to find, difficult to demonstrate effectiveness, and costly to implement. To date, the City has only been able to show bacteria reduction success (in field) with nuisance water diversion and ozone treatment technology.

Response: The San Diego Water Board appreciates the earnest efforts undertaken by the City in its BMP researches. All the BMPs listed in the Technical Report should be considered, among others, as potential BMPs either used separately or as part of a treatment train of BMPs. Filter sacks are effective in removing large debris (diapers,

etc…) from storm water and may provide some benefit in bacteria reduction. However, the actual BMPs to be implemented will be determined by the discharger.

5.8 Economics

Comment 275

Economics: The TMDL document as written provides available best management practice cost considerations, but falls short in providing estimated costs for overall compliance programs based on the tasks necessary to carry out the TMDL implementation plan (A Process for Addressing Impaired Waters in California, Section 7.5, draft SWRCB document March 2005). This information is essential for developing the public policy and funding mechanisms necessary to prepare and comply with the requirements.

Response: We are required to consider the costs of reasonably foreseeable methods of compliance with the proposed TMDL. Because the Implementation Plan includes an agricultural water quality control program, an estimate of the total cost of that program must be disclosed and potential sources of funding identified as required by Water Code section 13141. The Technical Report has been revised to include this information on the agricultural component. We have considered this information in implementation planning – specifically in determining the length of the compliance period. The dischargers may need to expand on this analysis to develop policy and funding mechanisms for site specific projects.

Comment 276

The presentation of the "Total Cost Estimates for Structural Controls for Urbanized Areas" in Table 13-3 is inadequate and misleading. Despite the title of the table, the treatment cost range presented is for only 10% of an urbanized area, not 100%; and in the case of "diversion", the cost for a single diversion is listed without estimating the number/total cost of diversions that might be called for over the urbanized acreage. There is also no mention in the text that various BMPs have different bacteria-removal effectiveness rates not necessarily capable of achieving the necessary reduction targets; that some BMPs are suitable for dry weather flows but not wet weather; or that no real analysis has been done to indicate whether spending all this money (even on the high end) would achieve compliance. It should also be noted that achieving compliance with bacteria indicators may not achieve the over-arching goal of reducing risks to public health, since the bacteria are only indicators, and not the actual pathogens of concern.

Response: Cost estimates are provided in increments of 10 percent to allow for upward scaling of costs since the amount of treatment and methods needed to achieve compliance with the proposed TMDLs may vary within a watershed and from watershed to watershed. For example, using the 10 percent cost estimates provided in Table 13-3, a cost estimate for 100 percent land treatment could easily be calculated by multiplying the 10 percent cost estimate by 10, or by 5 for 50 percent, or 8 for 80 percent, etc. Likewise, the estimated cost of one diversion structure is provided and can be scaled upward depending on the scenario of what might be needed in any given watershed. To improve clarity, the title of Table 13-3 has been renamed and additional language has been added

to section 13.2.2 to clarify the use of cost estimates based on 10 percent of urbanized area.

The commenter requests information on BMP effectiveness rates and suitability for dry weather flows versus wet weather flows, and an analysis about whether spending money on TMDL implementation would achieve compliance. Watershed and site-specific studies will be needed to plan and determine the effectiveness and feasibility of BMPs to ensure that targets are met. However, providing this information is beyond the scope of this discussion. We are required to consider the costs of reasonably foreseeable methods of compliance with the proposed TMDL. The purpose of this analysis is to provide cost information useful for implementation planning; most significantly, the length of the compliance schedule.

We disagree with the statement that "achieving compliance with bacteria indicators may not achieve the over-arching goal of reducing risks to public health, since the bacteria are only indicators, and not the actual pathogens of concern." In fact, the Mission Bay source identification study[28] and epidemiological study[29] show that there is a vastly reduced public health risk to swimmers in a water body where BMPs have virtually eliminated urban runoff to the receiving water. Therefore, in contrast to focusing on the relationship between bacteria and pathogens, we recommend that dischargers focus on abating anthropogenic sources that are the cause of illness, which are largely associated with urban runoff.

Comment 277

The economic analysis for TMDL project implementation costs is inadequate. The analysis does not take into account the urbanized nature of the majority of watersheds in the TMDL and the need to purchase land for BMP installation. Project implementation costs need to include land acquisition costs. Additionally, the analysis should include the bacteria-reduction effectiveness of the proposed BMPs. Without this information it is impossible to judge the potential effect on water quality the BMP will have for the cost listed.

Response: We disagree that the economic analysis is inadequate. We are required to consider the costs of reasonably foreseeable methods of compliance with the proposed TMDL, such as implementation of reasonably foreseeable types of BMPs for the purpose of bacteria reduction. This economic analysis includes a presentation of a variety of BMP types that includes a range of costs and potential effectiveness rates. We consider this information for implementation planning purposes – specifically in setting the length of the compliance period. Providing a cost benefit analysis based on BMP effectiveness rates is beyond the scope of this requirement. We are not required to speculate about

[28] City of San Diego and MEC/Weston. 2004. Mission Bay Clean Beaches Initiative Bacterial Source Identification Study. City of San Diego and MEC Analytical Systems-Weston Solutions, Inc., San Diego California. Prepared for the State Water Resources Control Board, Sacramento, CA.
[29] Colford, M.J., T.J. Wade, K.C. Schiff, C.C. Wright, J.F. Griffith, S.K. Sandhu, S.B. Weisberg. 2005. Recreational water contact and illness in Mission Bay, CA. Southern California Coastal Water Research Project Technical Report No. 449. Southern California Coastal Water Research Project, Westminster, CA.

site-specific projects that persons or entities identified as dischargers might implement or which BMP will be the most appropriate based on cost and effectiveness. We disagree that the need to purchase land for BMP installation is reasonably foreseeable. In fact, due to the expense of land acquisition, dischargers are most likely to select BMPs that do not require land acquisition. Additionally, because the size of BMPs can be minimized through the types of BMPs selected, and engineering solutions exist to minimize the footprint of structural BMPs, displacement of existing development is not likely to be on a scale that will cause significant economic hardship.

Comment 278

The Executive Summary, Section 1.8 last paragraph states that there would be no additional beach water quality monitoring costs incurred by the discharges because it is required by the California Health & Safety Code. This is an incorrect statement. The County of San Diego Department of Environmental Health performs monitoring of beach water quality and is reimbursed by the State Board for those sites that meet AB411 criteria. The coastal San Diego MS4 copermittees perform monitoring at some of those beaches biweekly April through October and monthly the remaining time of the year. The proposed monitoring for the TMDL is a minimum of three times greater than the current monitoring costs.

Response: Sections 1.8 and 13.2.4 discuss cost estimates for surface water monitoring as a result of implementing these TMDLs. The statement that "the dischargers will incur no additional costs for monitoring water quality at beaches" has been deleted. The monitoring and reporting as required by Health and Safety Code section 15880 spans the summer months, only. Therefore, should monitoring for TMDL compliance take place in the winter months, dischargers will incur additional costs over those associated with the requirements of the Health and Safety Code.

The Technical Report does not specify locations or a monitoring frequency for determining compliance with the TMDLs. How the costs associated with monitoring as a result of these TMDLs will compare to existing monitoring costs is not known because specific TMDL monitoring plans have not been prepared. Therefore, the costs reported in the Technical Report are those associated with a two-person sampling team on a one-day effort. Once appropriate sampling locations and frequencies are identified in the Bacteria Load Reduction Plans, total costs associated with compliance with these TMDLs can be estimated.

Comment 279

Section 13 – The Economic Analysis for TMDL project implementation costs is inadequate. Table 13-1 uses capital costs in uninflated dollars. The analysis does not take into account the urbanized nature of the majority of watersheds in the TMDL and the need to purchase land for BMP installation. Project implementation costs need to include land acquisition costs. Table 13-3 is misleading by only calculating the potential costs for 10% of the watershed. If 100% compliance is required, 100% of the costs should be shown. Additionally, the analysis should include the bacteria-reduction effectiveness of

the proposed BMPs. Without this information it is impossible to judge the potential effect on water quality the BMP will have for the cost listed. Please identify the source used for these estimates and correct, if appropriate, noted in the attached letter regarding the Chollas Creek Metals TMDL.

The diversion BMP noted in the Regional Board's economic impact vastly underestimates the cost of this BMP by estimating only a $1 million cost associated with building a diversion structure. Other costs that would be required to implement this BMP would be upsizing of sewer pipe capacity between the diversion and the Point Loma Wastewater Treatment Plant because existing pipes are not large enough to convey storm water flows (and the TMDL for San Diego specifically addresses storm water flows). Given that sewers are generally not over-sized so that they can be "self-cleaning", a parallel conveyance system would be required. At the end of this conveyance, the Point Loma plant itself would need to be expanded to handle storm water flows. Region 9's CEQA analysis includes as mitigation a requirement to reintroduce water to drainages to avoid "drying out existing wetlands. A reintroduction of treated water to the headwaters of Waters of the US/state would also require construction of a new reclaimed or potable water distribution system. If reclaimed, rather than potable water were to be used, t is unknown whether Total Dissolved Solids levels in reclaimed water would adversely affect the beneficial uses in the receiving waters.

Response: We disagree that the economic analysis is inadequate. However, as recommended in the commenter, the capital cost amounts in Table 13-1 have been adjusted for inflation to provide clarity. The sources used for these estimates are noted in the footnote to Table 13-3. The full references can be found in section 16.

As part of CEQA, we are required to consider the costs of reasonably foreseeable methods of compliance with the proposed TMDL, such as implementation of reasonably foreseeable types of BMPs for the purpose of bacteria reduction. This economic analysis includes a presentation of a variety of BMP types that includes a range of costs and potential effectiveness rates. We have considered this information for implementation planning purposes – specifically in setting the length of the compliance period. Providing a cost benefit analysis based on BMP effectiveness rates is beyond the scope of this requirement. Furthermore, we are not required to speculate about site-specific projects that persons or entities identified as sources might implement or which BMP will be the most appropriate based on cost and effectiveness. See the response to Comment 277 for a discussion of land acquisition.

While 100 percent compliance is ultimately required by the proposed TMDL, treatment of 100 percent of the land may not be required to achieve compliance. In the analysis, we do not assume that every watershed will require 100 percent of the land to be treated with all of the potential BMP options; therefore, cost estimates are provided in increments of 10 percent to allow for upward scaling of costs, since the amount of treatment and methods needed to achieve compliance with the proposed TMDL may vary from watershed to watershed. For example, using the 10 percent cost estimates provided in Table 13-3, a cost estimate for 100 percent land treatment could easily be calculated by multiplying the 10% cost estimate by 10, or by 5 for 50 percent, or 8 for 80 percent, etc. To clarify, the title of Table 13-3 has been renamed and additional language has been

added to section 13.2.2 to clarify the use of cost estimates based on 10 percent of urbanized area.

We disagree that the estimate for a diversion BMP is underestimated. As noted in Table 13-3, the cost estimate for a diversion BMP is "greater than" $1 million, not $1 million as stated in the comment. Additionally, two examples are sited regarding diversion systems in section 13.2.1 and include a diversion and ultraviolet radiation treatment system that cost $1 million and a diversion and ozone treatment system that cost $6.7 million. Considerations, such as the "other costs" associated with building a diversion structure described by the comment, as well as the comments on potential mitigation discussed in the CEQA analysis, are project level, site-specific factors that we are not required to provide in this planning level discussion.

We removed the reference to the reintroduction of water to avoid "drying out of existing wetlands." Costs associated with land acquisition are addressed in the response to Comment 277.

Comment 280

P. 128 TMDL Project Implementation Costs: The economic analysis for TMDL project implementation costs is inadequate. The analysis does not take into account the urbanized nature of the majority of watersheds in the TMDL and the need to purchase land for BMP installation. Project implementation costs need to include land acquisition costs. Additionally, the analysis should include the bacteria-reduction effectiveness of the proposed BMPs. Without this information it is impossible to judge the potential effect on water quality the BMP will have for the cost listed. None of the proposed BMPs result in 100% reduction of bacteria, except for diversions during dry weather flow conditions.

Response: Please see the response to Comment 279.

Comment 281

It is clear, both from cost estimates in the document and from discussion during the Board workshop on January 11, that the total cost of BMPs needed to meet the TMDL targets is very large. This raises two issues. The first is whether the cost to prevent an illness is within the range established by other public health policies. This analysis could be conducted with information readily available from the health policy literature. If the cost per illness prevented, especially when weighted for relative severity, is near the top end of this range, it is likely that the TMDL program will generate public resistance, especially if the program "crowds out" other municipal investments in public health. The second cost-related issue stems from the fact that this TMDL program will not be implemented in isolation. Other TMDL programs are being developed and implemented and each will have its own implementation requirements. The Regional Board should conduct a costing exercise to estimate what the aggregate TMDL-related investment could be, whether this is even economically feasible, and whether there are possible cost-saving approaches. For example, is it possible to design and/or site the bacteria BMPs in a way that will help meet targets for other TMDLs? The permittees do not all have the

technical expertise to conduct such analyses. The current approach, in which TMDL implementation will apparently be addressed in a linear manner, will require separate BMP design and implementation cycles for each TMDL, an approach not designed for maximum efficiency.

Response: We recognize that implementing BMPs to comply with the TMDL requirements will likely be a substantial and costly undertaking by the dischargers; however, so are the costs associated with not adequately abating bacteria contamination.

In a recent study,[30] scientists investigated the economic impacts associated with contracting gastrointestinal illness from swimming at contaminated coastal waters at beaches in southern California. Authors used water quality data (specifically enterococci) from the year 2000, along with beach attendant data from 28 beaches, spanning 160 km of coastline in Los Angeles and Orange Counties, as input into two epidemiological dose-response models. The authors estimate that approximately 1 million excess gastrointestinal illnesses occur at beaches in Los Angeles and Orange Counties each year due to coastal contamination. Considering loss of time at work, doctor visits, and medicine for each occurrence, this equates to expenditures of about $36 million annually. This number is conservative because it does not include expenses associated with contracting other types of waterborne illnesses, nor does it account for lost recreational value, a swimmer's willingness to pay to avoid getting sick, or loss to coastal market economies that depend on contribution from beachgoers. Although this study focused specifically on beaches in Los Angeles and Orange Counties, we believe the results are applicable to the San Diego Region. Therefore, although we recognize the significant expenses associated with implementing BMPs, we also assert that efforts to abate bacteria contamination are necessary to avoid the likewise significant expenses associated with recreating in contaminated waters.

Recognizing the dischargers' need to develop comprehensive BMP programs, we are attempting to develop new TMDL projects that address all the impaired waterbodies in a watershed. We are cognizant of the fact that TMDLs can be substantial projects and multiple impairments in a single waterbody may complicate future TMDLs. Due to the complexity, development time, and the long implementation schedules, it would be impossible for us to predict the costs or impacts of current TMDLs on future TMDLs. Since the control measures will be selected by the dischargers when they develop their Bacteria Load Reduction Plans, whether or not the selected BMPs and MPs address solely bacteria reduction or a combination of bacteria and other pollutants of concern is at their discretion. Dischargers and stakeholders are not required to wait until a TMDL is initiated before they begin addressing water quality issues in their watersheds. However, to encourage dischargers to integrate BMP planning for all water quality problems in their watersheds, we have included a compliance schedule option to allow more time to meet the bacteria TMDLs, if integrated BMP planning and implementation is undertaken. Please see the revisions to section 11.4.2.

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[30] Given, Suzan, Linwood H. Pendleton, and Alexandria B. Boehm. 2006. Regional Public Health Cost Estimates of Contaminated Coastal Waters: A Case Study of Gastroenteritis at Southern California Beaches. *Environmental Science and Technology* (July 2006) 40 (16), 4851 -4858.

Comment 282

The Economic Analysis which begins on page B-11 is not sufficient as presented as the costs are based on data from 1999 and 2003. An economic analysis based on current and projected cost throughout the TMDL compliance schedule (i.e. account for inflation) should be provided, as well as the other items discussed in this letter, please.

Response: Providing the projected costs throughout the TMDL compliance schedule is beyond the scope of our requirements. Dischargers should run such analyses as part of their BMP planning effort.

Comment 283

On page R-66, "In order to achieve TMDL compliance, residential land use areas, like the area shown in Figure 6, may only require non-structural BMPs; however, structural BMPs could be retrofitted, if appropriate. Potential non-structural BMPs at this specific site include increased street sweeping, and development and enforcement of municipal ordinances prohibiting the discharge of bacteria and nuisance flows to stormwater and Stormwater drainage pathways. Other potential BMPs include adoption and enforcement of ordinances to pick up pet waste, and regular inspections of storm drains for cross connections with the sanitary sewers.

It should be noted that many of the underlined "potential" non-structural BMPs underlined above are already being implemented in most watersheds, if not all of them. So while the report states that "…residential land use areas,…may only require non-structural BMPs…." may not be appropriate and the costs for some structural BMPs should be accounted for in the economic analysis. Please also define "retrofit".

Response: We are unsure of whether or not structural BMPs will be necessary, therefore our language was appropriately not definitive. In some cases, structural BMPs may not be necessary to achieve the desired goal of reduced bacteria levels. In other cases, structural BMPs will be necessary. By retrofitting BMPs, we mean to install, fit, or adapt a structural BMP (such as a storm drain filter sack) into existing stormwater drainage pathways.