ATTACHMENT 2 TO RESOLUTION NO. R8-2011-0037

Revised Organochlorine Compounds TMDLs for San Diego Creek, Upper and Lower Newport Bay (Attachment 2 to Resolution No. R8-2007-0024)

(NOTE: The language identified below is proposed to be inserted into Chapter 5 of the Basin Plan. If the amendment is approved, corresponding changes will be made to the Table of Contents, the List of Tables, page numbers, and page headers in the plan. Due to the two-column page layout of the Basin Plan, the location of tables in relation to text may change during final formatting of the amendment. In order to accommodate other new TMDLs adopted as Basin Plan amendments and to maintain their order by watershed, the table and figure identifiers may be modified in future formatting of the Basin Plan for re-publication purposes. However, no substantive changes to the tables/figures would occur absent a Basin Plan Amendment.)

Chapter 5 - Implementation Plan, Discussion of Newport Bay Watershed (page 5-39 *et seq*), add the following to 4. Toxics Substances Contamination

4.b Organochlorine Compounds TMDLs

Organochlorine compounds, including DDT, PCBs, toxaphene and chlordane, possess unique physical and chemical properties that influence their persistence, fate and transport in the environment. While these characteristics vary among the organochlorine compounds, they all exhibit an ability to resist degradation, partition into sediment, and to accumulate in the tissue of organisms, including invertebrates, fish, birds and mammals. The bioaccumulation of these compounds can adversely affect the health and reproductive success of aquatic organisms and their predators, and can pose a health threat to human consumers.

A TMDL technical report prepared by Regional Board staff [Ref. # 1] describes organochlorine-related problems in Newport Bay and its watershed and delineates the technical basis for the TMDLs that follow.

The waterbody-pollutant combinations for which organochlorine compounds TMDLs were established by the Regional Board are listed in Table NB-OCs-1. These TMDLs differ from those established by USEPA in 2002 in several respects:

First, based on an updated impairment assessment that utilized new data and applied the State Water Board's "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List" (2004) [Ref. # 2], the Regional Board established TMDLs for a list of organochlorine compound-waterbody combinations different from that of USEPA. As shown in Table NB-OCs-2, USEPA also established TMDLs for dieldrin, chlordane, and PCBs in San Diego Creek and for dieldrin in Lower Newport Bay. In contrast, the Regional Board found no impairment as the result of dieldrin in any of these waters, nor was impairment due to chlordane or PCBs found in San Diego Creek and its tributaries.

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As described in the TMDL technical report, Regional Board staff also found no impairment due to DDT in San Diego Creek or its tributaries. However, in adopting the 2006 Section 303(d) list (October 25, 2006, Resolution No. 2006-0079), the State Water Board found impairment due to DDT in Peter's Canyon Channel. In response, the Regional Board established a TMDL for DDT in San Diego Creek and its tributaries, including Peters Canyon Channel.

Second, corrections and modifications were made to loading capacities and existing loads identified in USEPA's TMDLs. Finally, an implementation plan is specified (see Section 4.b.3).

While the Regional Board did not establish TMDLs for chlordane and PCBs for San Diego Creek and tributaries, the Board did develop informational TMDLs for these substances in these waters, pursuant to Clean Water Act Section 303(d)(3). These informational TMDLs are shown in Table NB-OCs-3. This action was taken in light of several factors. First, the largest source of organochlorine compounds to Newport Bay is San Diego Creek. Second, the data suggest that the existing loading of chlordane to the Creek is greater than the loading capacity. This suggests that the lack of finding of impairment due to chlordane may be simply a reflection of a lack of data with which to assess impairment. Finally, these informational TMDLs may forward action to address organochlorine compound problems in the watershed. These informational TMDLs have no regulatory effect but may be used as the basis for further investigation of the relative contributions of the various sources of organochlorine compound inputs to San Diego Creek and thence the Bay. In the long-term, this would be expected to help assure proper apportionment of responsibility for implementation of the TMDLs identified in Table NB-OCs-1.

Table NB-OCs-1. Waterbody-pollutant combinations for which Organochlorine Compound TMDLs are established

Waterbody	***Pollutant***
San Diego Creek and tributaries	DDT, Toxaphene
Upper Newport Bay	Chlordane, DDT, PCBs
Lower Newport Bay	Chlordane, DDT, PCBs

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Table NB-OCs-2. Waterbody-pollutant combinations for which Organochlorine Compounds TMDLs were established by USEPA (2002) and Regional Board (2007)

Waterbody	***TMDLs***	
	USEPA	**Regional Board**
San Diego Creek and tributaries*	Chlordane, dieldrin, DDT, PCBs, Toxaphene	DDT, Toxaphene
Upper Newport Bay	Chlordane, DDT, PCBs	Chlordane, DDT, PCBs
Lower Newport Bay	Chlordane, dieldrin, DDT, PCBs	Chlordane, DDT, PCBs

*TMDLs are established for San Diego Creek and tributaries, even if impairment was only found in particular reaches (e.g., SWRCB found DDT impairment in Peter's Canyon Channel, a primary tributary to San Diego Creek Reach 1, but the TMDL includes all of San Diego Creek and tributaries).

Table NB-OCs-3. Informational TMDLs

Waterbody	***Informational TMDLs***
San Diego Creek and tributaries	Chlordane, PCBs

4.b.1 Numeric Targets used in Organochlorine Compounds TMDLs

Numeric targets identify specific endpoints in sediment, water column or tissue that equate to attainment of water quality standards, which is the purpose of TMDLs. Multiple targets may be appropriate where a single indicator is insufficient to protect all beneficial uses and/or attain all applicable water quality objectives. The range of beneficial uses identified in this Basin Plan (see Chapter 3) for the waters addressed by the organochlorine compounds TMDLs makes clear that the targets must address the protection of aquatic organisms, wildlife (including federally listed threatened and endangered species) and human consumers of recreationally and commercially caught fish.

Sediment, water column and fish tissue targets are identified for these TMDLs, as shown in Table NB-OCs-4. The sediment and water column targets are identical to those selected by USEPA in the development of their organochlorine compounds TMDLs (2002). Fish tissue targets are added for the protection of aquatic life and wildlife.

The targets employed in the development of informational TMDLs for chlordane and PCBs in San Diego Creek and its tributaries are shown in Table NB-OCs-5.

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Table NB-OCs-4. Numeric Sediment, Fish Tissue, and Water Column TMDL Targets

	Total DDT	Chlordane	Total PCBs	Toxaphene
Sediment Targets[1]; units are μg/kg dry weight				
San Diego Creek and tributaries	6.98			0.1
Upper & Lower Newport Bay	3.89	2.26	21.5	
Fish Tissue Targets for Protection of Human Health[2]; units are μg/kg wet weight				
San Diego Creek and tributaries	100			30
Upper & Lower Newport Bay	100	30	20	
Fish Tissue Targets for Protection of Aquatic Life and Wildlife[3]; units are μg/kg wet weight				
San Diego Creek and tributaries	1000			100
Upper & Lower Newport Bay	50	50	500	
Water Column Targets for Protection of Aquatic Life, Wildlife & Human Health[4] (μg/L)				
San Diego Creek and tributaries				
Acute Criterion (CMC[a])	1.1			0.73
Chronic Criterion (CCC[b])	0.001			0.0002
Human Health Criterion	0.00059			0.00075
Upper & Lower Newport Bay				
Acute Criterion (CMC[a])	0.13	0.09		
Chronic Criterion (CCC[b])	0.001	0.004	0.03	
Human Health Criterion	0.00059	0.00059	0.00017	

[1]Freshwater and marine sediment targets, except toxaphene, are Threshold Effect Levels (TELs) from Buchman, M.F. 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pp. Toxaphene target is from N.Y. Dept. of Environmental Conservation.

[2]Freshwater and marine fish tissue targets for protection of human health are Office of Environmental Health Hazard Assessment (OEHHA) Screening Values (SVs).

[3]Freshwater and marine fish tissue targets for protection of aquatic life and wildlife are from Water Quality Criteria 1972. A report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences, National Academy of Engineering. Washington, D.C., 1972.

[4]Freshwater and marine targets are from California Toxics Rule (2000).

[a] CMC: Criteria Maximum Concentration
[b] CCC: Continuous Criteria Concentration

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Table NB-OCs-5. Numeric Sediment, Fish Tissue, and Water Column Targets used in Informational TMDLs

	Chlordane	Total PCBs
Sediment Targets[1]; units are μg/kg dry weight		
San Diego Creek and tributaries	4.5	34.1
Fish Tissue Targets for Protection of Human Health[2]; units are μg/kg wet weight		
San Diego Creek and tributaries	30	20
Fish Tissue Targets for Protection of Aquatic Life and Wildlife[3]; units are μg/kg wet weight		
San Diego Creek and tributaries	100	500
Water Column Targets for Protection of Aquatic Life, Wildlife & Human Health[4] (μg/L)		
San Diego Creek and tributaries		
Acute Criterion (CMC[a])	2.4	
Chronic Criterion (CCC[b])	0.0043	0.014
Human Health Criterion	0.00059	0.00017

[1]Freshwater sediment targets are Threshold Effect Levels (TELs) from Buchman, M.F. 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pp.
[2]Freshwater fish tissue targets for protection of human health are Office of Environmental Health Hazard Assessment (OEHHA) Screening Values (SVs).

[3]Freshwater fish tissue targets for protection of aquatic life and wildlife are from Water Quality Criteria 1972. A report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences, National Academy of Engineering. Washington, D.C., 1972.

[4]Freshwater targets are from California Toxics Rule (2000).

[a] CMC: Criteria Maximum Concentration
[b] CCC: Continuous Criteria Concentration

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The linkage between adverse effects in sensitive wildlife species and concentrations of the organochlorine pollutants in sediments, prey organisms and water is not well understood at the present time, although work is underway to better understand ecological risk in Newport Bay. In addition, the State is in the process of developing sediment quality objectives that should provide guidance for assessing adverse effects due to pollutant bioaccumulation. Reducing contaminant loads in the sediment will result in progress toward reducing risk to aquatic life and wildlife. During implementation of these TMDLs, additional and/or modified wildlife or other targets will be identified as risk assessment information becomes available. These TMDLs will be revisited (see 4.b.3) and revised as appropriate.

4.b.2. Organochlorine Compounds TMDLs, Wasteload Allocations, Load Allocations and Compliance Dates

The organochlorine compounds TMDLs for San Diego Creek and its tributaries, Upper Newport Bay and Lower Newport Bay are shown in Tables NB-OCs-6 and NB-OCs-7. The TMDLs are expressed on a daily basis (average grams per day) in Table NB-OCs-6, and on an annual basis (grams per year) in Table NB-OCs-7. Expression of the TMDLs on a daily basis is intended to comply with a relevant court decision. However, because of the strong seasonality associated with the loading of organochlorine compounds during storm events, it is appropriate for implementation to occur based on average annual loadings. The TMDLs are to be achieved as soon as possible but no later than *(seven years from the date of OAL approval of this Basin Plan Amendment (BPA)).*

Table NB-OCs-6. TMDLs for San Diego Creek, Upper and Lower Newport Bay (expressed on a "daily" basis to be consistent with the D.C. Circuit Court of Appeals decision in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015 [D.C. Cir.2006])

Water Body	Pollutant	TMDL (average grams per day)[a]
San Diego Creek and Tributaries	Total DDT	1.08
	Toxaphene	0.02
Upper Newport Bay	Total DDT	0.44
	Chlordane	0.25
	Total PCBs	0.25
Lower Newport Bay	Total DDT	0.16
	Chlordane	0.09
	Total PCBs	0.66

[a] Compliance to be achieved as soon as possible but no later than (*seven years from the date of OAL approval of this BPA*).

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Table NB-OCs-7. TMDLs for San Diego Creek, Upper and Lower Newport Bay (expressed on annual basis for implementation purposes)

Water Body	Pollutant	TMDL (grams per year)[a]
San Diego Creek and Tributaries	Total DDT	396
	Toxaphene	6
Upper Newport Bay	Total DDT	160
	Chlordane	93
	Total PCBs	92
Lower Newport Bay	Total DDT	59
	Chlordane	34
	Total PCBs	241

[a] Compliance to be achieved as soon as possible but no later than (*seven years from the date of OAL approval of this BPA*).

Informational TMDLs for San Diego Creek and its tributaries for chlordane and total PCBs are shown in Table NB-OCs-8. Again, these informational TMDLs are expressed on average daily and annual bases.

Table NB-OCs-8. Informational TMDLs for San Diego Creek and Tributaries (expressed on average daily and annual bases)

Water Body	Pollutant	TMDL (average grams per day)
San Diego Creek and Tributaries	Chlordane	0.70
	Total PCBs	0.34
		TMDL (grams per year)
San Diego Creek and Tributaries	Chlordane	255
	Total PCBs	125

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Wasteload and load allocations to achieve the TMDLs specified in Tables NB-OCs-6 and NB-OCs-7 are shown in Tables NB-OCs-9 and NB-OCs-10, respectively. Like the TMDLs, the allocations are expressed in terms of both average daily and annual loads. An explicit margin of safety (MOS) of ten percent was applied in calculating the allocations. Consistent with the TMDL compliance schedule, these allocations are to be achieved as soon as possible but no later than *(seven years from the date of OAL approval of this BPA*).

Wasteload and load allocations necessary to meet the informational TMDLs shown in Table NB-OCs-8 are identified in Tables NB-OCs-11 (expressed as average daily loads) and NB-OCs-12 (expressed as annual loads). These allocations are identified only for informational purposes.

4.b.3. Implementation of Organochlorine Compounds TMDLs

These TMDLs are to be implemented within an adaptive management framework, with compliance monitoring, special studies, and stakeholder interaction guiding the process over time. Information obtained from compliance monitoring will measure progress towards achievement of WLAs and LAs, potentially leading to changes to TMDL allocations; ongoing investigations and recommended special studies, if implemented, may provide information that leads to revisions of the TMDLs, adjustments to the implementation schedule, and/or improved implementation strategies. Thus, implementation of the TMDLs is expected to be an ongoing and dynamic process.

The implementation plan identified in this section reflects the adaptive management, phased approach to the organochlorine compound TMDLs adopted by the Regional Board. The Board found a phased approach, with compliance schedules, appropriate in light of the following considerations. First, it was recognized that additional monitoring and special studies were either already underway or would be needed to address data limitations and significant uncertainty associated with the TMDL calculations, and that changes to the TMDLs might be appropriate based on the results of those investigations. Second, it was also understood that these data limitations and uncertainties pertained to the impairment assessment itself and the determination of the specific organochlorine compounds for which TMDLs are required. Third, the natural attenuation of these compounds over time is expected to affect significantly the selection, development and implementation of BMPs. As described in the TMDL technical report [Ref.1], use of the organochlorine compounds addressed by these TMDLs has been banned for many years and trend analyses indicate declining concentrations of these substances in fish tissue over time. Natural attenuation should eventually reduce organochlorine pollutant levels to concentrations that pose no threat to beneficial uses in San Diego Creek or Newport Bay. While natural degradation of these compounds is likely the principal cause of the observed decline in fish tissue concentrations, the implementation of erosion and sediment controls and other Best Management Practices to address compliance with the sediment and nutrient TMDLs for Newport Bay and its watershed (see

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Table NB-OCs-9. TMDLs and Allocations for San Diego Creek, Upper and Lower Newport Bay (expressed on a "daily" basis to be consistent with the recent D.C. Circuit Court of Appeals decision in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015 [D.C. Cir.2006]).[a,b]

	Type	Total DDT	Chlordane	Total PCBs	Toxaphene
		(average grams/day)			
San Diego Creek					
WLA	Urban Runoff – County MS4 (36%)	0.35			0.005
	Construction (28%)	0.27			0.004
	Commercial Nurseries (4%)	0.04			0.001
	Caltrans MS4 (11%)	0.11			0.002
	Subtotal – WLA (79%)	**0.77**			**0.01**
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.05			0.001
	Open Space (9%)	0.09			0.001
	Streams &Channels (2%)	0.02			0.0003
	Undefined (5%)	0.05			0.001
	Subtotal – LA (21%)	**0.21**			**0.003**
MOS (10% of total TMDL)		**0.11**			**0.002**
Total TMDL		**1.08**			**0.02**
Upper Newport Bay					
WLA	Urban Runoff - County MS4 (36%)	0.14	0.08	0.08	
	Construction (28%)	0.11	0.06	0.06	
	Commercial Nurseries (4%)	0.02	0.01	0.01	
	Caltrans MS4 (11%)	0.04	0.03	0.02	
	Subtotal – WLA (79%)	**0.31**	**0.18**	**0.18**	
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.02	0.01	0.01	
	Open Space (9%)	0.04	0.02	0.02	
	Streams & Channels (2%)	0.01	0.005	0.005	
	Undefined (5%)	0.02	0.01	0.01	
	Subtotal – LA (21%)	**0.08**	**0.05**	**0.05**	
MOS (10% of Total TMDL)		**0.04**	**0.03**	**0.03**	
Total TMDL		**0.44**	**0.25**	**0.25**	
Lower Newport Bay					
WLA	Urban Runoff – County MS4 (36%)	0.05	0.03	0.21	
	Construction (28%)	0.04	0.02	0.17	
	Commercial Nurseries (4%)	0.01	0.003	0.02	
	Caltrans MS4 (11%)	0.02	0.01	0.07	
	Subtotal – WLA (79%)	**0.11**	**0.07**	**0.47**	
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.01	0.004	0.03	
	Open Space (9%)	0.01	0.01	0.05	
	Streams & Channels (2%)	0.003	0.002	0.01	
	Undefined (5%)	0.01	0.004	0.03	
	Subtotal – LA (21%)	**0.03**	**0.02**	**0.12**	
MOS (10% of Total TMDL)		**0.02**	**0.01**	**0.07**	
Total TMDL		**0.16**	**0.09**	**0.66**	

[a] Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the Total TMDL. Percent WLA and Percent LA add to 100%.
[b] Compliance to be achieved as soon as possible but no later than *(seven years from the date of OAL approval of this BPA)*.

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Table NB-OCs-10. TMDLs and Allocations for San Diego Creek, Upper and Lower Newport Bay (expressed on an "annual" basis for implementation purposes).[a, b]

		Total DDT	Chlordane	Total PCBs	Toxaphene
	Type	**(grams per year)**			
San Diego Creek					
WLA	Urban Runoff – County MS4 (36%) Construction (28%) Commercial Nurseries (4%) Caltrans MS4 (11%) **Subtotal – WLA (79%)**	128.3 99.8 14.3 39.2 **281.6**			1.9 1.5 0.2 0.6 **4.3**
LA	Agriculture (5%) (excludes nurseries under WDRs)	17.8			0.3
	Open Space (9%)	32.1			0.5
	Streams & Channels (2%)	7.1			0.1
	Undefined (5%)	17.8			0.3
	Subtotal – LA (21%)	**74.8**			**1.1**
MOS **(10% of Total TMDL)**		**40**			**0.6**
Total TMDL		**396**			**6**
Upper Newport Bay					
WLA	Urban Runoff – County MS4 (36%) Construction (28%) Commercial Nurseries (4%) Caltrans MS4 (11%) **Subtotal – WLA (79%)**	51.8 40.3 5.8 15.8 **113.8**	30.1 23.4 3.3 9.2 **66.1**	29.8 23.2 3.3 9.1 **65.4**	
LA	Agriculture (5%) (excludes nurseries under WDRs)	7.2	8	7	
	Open Space (9%)	13.0	7.6	7.5	
	Streams & Channels (2%)	2.9	1.7	1.7	
	Undefined (5%)	7.2	4.2	4.2	
	Subtotal – LA (21%)	**30.2**	**21.4**	**20.3**	
MOS **(10% of Total TMDL)**		**16**	**9**	**9**	
Total TMDL		**160**	**93**	**92**	
Lower Newport Bay					
WLA	Urban Runoff – County MS4 (36%) Construction (28%) Commercial Nurseries (4%) Caltrans MS4 (11%) **Subtotal – WLA (79%)**	19.1 14.9 2.1 5.8 **41.9**	11.0 8.6 1.2 3.4 **24.2**	78.1 60.7 8.7 23.9 **171.4**	
LA	Agriculture (5%) (excludes nurseries under WDRs)	2.7	1.5	10.8	
	Open Space (9%)	4.8	2.8	19.5	
	Streams & Channels (2%)	1.1	0.6	4.3	
	Undefined (5%)	2.7	1.5	10.8	
	Subtotal – LA (21%)	**11.2**	**6.4**	**45.5**	
MOS **(10% of Total TMDL)**		**5.9**	**3.4**	**24**	
Total TMDL		**59**	**34**	**241**	

[a] Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the total TMDL. Percent WLA and Percent LA add to 100%.
[b] Compliance to be achieved as soon as possible but no later than *(seven years from the date of OAL approval of this BPA).*

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Table NB-OCs-11. Informational TMDLs and Allocations for San Diego Creek (expressed on a "daily" basis) [a]

Category	Type	Chlordane	Total PCBs
		(average grams per day)	
San Diego Creek			
WLA	Urban Runoff – County MS4 (36%)	0.23	0.11
	Construction (28%)	0.18	0.09
	Commercial Nurseries (4%)	0.03	0.01
	Caltrans MS4 (11%)	0.07	0.03
	Subtotal – WLA (79%)	**0.50**	**0.24**
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.03	0.02
	Open Space (9%)	0.06	0.03
	Streams &Channels (2%)	0.01	0.01
	Undefined (5%)	0.03	0.02
	Subtotal – LA (21%)	**0.13**	**0.08**
MOS (10% of total TMDL)		**0.07**	**0.03**
Total TMDL		**0.70**	**0.34**

[a] Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the Total TMDL. Percent WLA and Percent LA add to 100%.

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Table NB-OCs-12. Informational TMDLs and Allocations for San Diego Creek (expressed on an "annual" basis) [a]

Category	Type	Chlordane	Total PCBs
		(grams per year)	
San Diego Creek			
WLA	Urban Runoff – County MS4 (36%)	82.6	40.5
	Construction (28%)	64.3	31.5
	Commercial Nurseries (4%)	9.2	4.5
	Caltrans MS4 (11%)	25.2	12.4
	Subtotal – WLA (79%)	**181.3**	**88.9**
LA	Agriculture (5%) (excludes nurseries under WDRs)	11.5	5.6
	Open Space (9%)	20.7	10.1
	Streams &Channels (2%)	4.6	2.3
	Undefined (5%)	11.5	5.6
	Subtotal – LA (21%)	**48.2**	**23.6**
MOS (10% of total TMDL)		**26**	**13**
Total TMDL		**255**	**125**

[a.] Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the total TMDL. Percent WLA and Percent LA add to 100%.

discussions of these TMDLs elsewhere in this Basin Plan) is a probable factor. In any case, the observed trends suggest that as monitoring continues in the watershed and pollutant levels decline, some or all of the organochlorine compounds may warrant delisting from the Clean Water Act Section 303(d) list of impaired waters. Again, these TMDLs would need to be revisited accordingly.

This implementation plan also reflects recommendations by regulated stakeholders in the Newport Bay watershed to convene a Working Group to develop and implement a comprehensive Work Plan to: address, as an early action item, the technical uncertainties in these TMDLs and make recommendations for revisions, as appropriate; identify and prioritize tasks necessary to implement the TMDLs; integrate TMDL implementation tasks with those already being conducted in response to other programs (e.g., permits, other TMDLs); and, investigate other pollutants of concern in the watershed.

Table NB-OCs-13 lists the tasks and schedules needed to implement the organochlorine TMDLs. This implementation plan is aimed at identifying actions to accelerate the decline in organochlorine compound concentrations in the watershed, and to augment their natural attenuation. The implementation plan is focused to a large extent on the monitoring and, where necessary, enhanced implementation of Best Management Practices (BMPs) to reduce the erosion and transport to surface waters of fine sediment to which the organochlorine compounds tend to adhere. Many of these BMPs are already in place as the result of existing permits issued by the Regional Board or State Water Resources Control Board for stormwater and construction activities, and/or in response to established TMDLs. The intent is to

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assure that source control activities are implemented to reduce any active sources of the organochlorine compounds, and in other areas where such actions will be most effective in meeting the TMDL goals. Monitoring and special study requirements are included to provide for TMDL compliance assessment and refinement.

In response to the recommendation by watershed stakeholders, this implementation plan provides an opportunity for dischargers to participate in the development and implementation of a comprehensive Work Plan. The implementation tasks identified in Table NB-OCs-13 (except Tasks 1 and 4; see discussion of Task 7, below) will be considered in the development of the Work Plan and incorporated, as appropriate. Implementation of the Work Plan, which will be approved by the Regional Board at a public hearing, will obviate the need for individual actions on the tasks in Table NB-OCs-13 by members of the Working Group. Completion of the Work Plan will result, in part, in recommendations for revisions to these TMDLs based on review by an Independent Advisory Panel and the results of ongoing or requisite monitoring and investigations, and in the development of a comprehensive plan for BMPs and other actions needed to assure compliance with the TMDLs, wasteload allocations and load allocations as soon as possible after completion of execution of the Work Plan but no later than *(seven years from the date of OAL approval of this BPA)*[1]. Dischargers who elect not to participate in the Work Plan approach will be required to implement the tasks shown in Table NB-OCs-13, as appropriate.

Each of the tasks identified in Table NB-OCs-13 is described below.

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[1] This compliance schedule and/or the organochlorine compounds TMDLs may be modified, through the Basin Planning process, in response to information provided by implementation of the Work Plan tasks and/or other investigations.

Table NB-OCs-13. Organochlorine Compounds TMDLs Implementation Tasks and Schedule

Task	Description	Compliance Date – As Soon As Possible But No Later Than [b,c]
PHASE I IMPLEMENTATION		
1	Revise existing WDRs and NPDES permits: *Commercial Nursery WDRs, MS4 Permit, Other NPDES Permits*	Upon OAL approval of BPA and permit renewal
2[a]	a. Develop proposed agricultural BMP and monitoring program to assess and control OCs discharges. b. Implement program	a. (*3 months after OAL approval of BPA*) b. Upon Regional Board approval
3[a]	a. Identify responsible parties for open space areas b. Develop proposed monitoring program to assess OCs inputs from open space areas c. Implement proposed monitoring program d. Develop plan to implement effective erosion and sediment control BMPs for management of fine particulates (if found necessary based on monitoring results) e. Implement BMP plan	a.(*1 month after OAL approval of BPA*) b. 2 months after notification of responsible parties c. Upon Regional Board approval d. Within 6 months of notification of need to develop plan e. Upon Regional Board approval
4[a]	Implement effective sediment and erosion control BMPs for management of fine particulates on construction sites: Regional Board: a. Develop SWPPP Improvement Program MS4 permittees: b. Revise planning processes as necessary to assure proper communication of SWPPP requirements c. Evaluate/implement BMPs effective in reducing/eliminating organochlorine discharges: i. Submit proposed plan and schedule for BMP studies and implement plan ii. Submit studies report; including plan and schedule to implement BMPs/include in Guidance Manual iii. Implement BMPs/include in Guidance Manual	a. (*Upon OAL approval of BPA*) b. Within 3 months of appropriate revision of the MS4 permit c. i. Submit plan within 3 months of 13267 letter issuance/MS4 permit revision and implement upon Executive Officer approval; ii. Within 6 months of completion of studies plan; iii. Upon Executive Officer approval
5[a]	Evaluate sources of OCs; develop and implement BMPs accordingly: a. Submit proposed plan and schedule for source	a. Submit plan within 3 months of 13267 letter issuance/appropriate revision of the MS4 permit

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	area investigations b. Implement investigation plan c. Submit report of investigation findings and plan/schedule for implementation of BMPs d. Implement BMP plan	b. Upon Executive Officer approval c. Within 6 months of completion of investigation plan d. Upon Executive Officer approval
6[a]	Evaluate feasibility and mechanisms to fund future dredging operations within San Diego Creek, Upper and Lower Newport Bay	Submit feasibility/funding report within *(3 years after OAL approval of BPA)*
7	Develop comprehensive Work Plan to meet TMDL implementation requirements, consistent with an adaptive management approach a. Convene Working Group b. Submit proposed Work Plan c. Implement Work Plan d. Complete execution of Work Plan	a. (*one month of OAL approval of BPA*) b. (*3 months after OAL approval of BPA)* c. Upon Regional Board approval d. Within 5 years of Work Plan approval
8[a]	Revise regional monitoring program	(*3 months after OAL approval of BPA)*; Annual Reports due November 15
9	Conduct special studies	As funding allows, and in order of priority identified in comprehensive Work Plan (Task 7), if applicable
PHASE II IMPLEMENTATION		
10	Review TMDLs, including numeric targets, WLAs and LAs; delist or revise TMDLs pursuant to established Sediment Quality Objectives, new data, and results of special studies	No later than (*5 years from OAL approval of BPA*)

a. The tasks and schedules identified in the Regional Board approved Work Plan developed by the Working Group shall govern implementation activities by members of the Working Group.
b. Final compliance with the TMDLs to be achieved no later than *(seven years from the date of OAL approval of this BPA*).
c. The Regional Board may, after a public hearing, and without need for a Basin Plan amendment, revise the schedules in this table, except for the final compliance date of (*seven years from the date of OAL approval of this BPA*), if it determines good cause exists for such revisions.

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Table NB-OCs-14. Existing NPDES Permits and WDRs Regulating Discharges in the Newport Bay Watershed

No.	Permit Title	Order No.	NPDES No.
1	Waste Discharge Requirements for the United States Department of the Navy, Former Marine Corps Air Station Tustin, Discharge to Peters Canyon Wash in the San Diego Creek/Newport Bay Watershed	R8-2006-0017	CA8000404
2	Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the Incorporated Cities of Orange County within the Santa Ana Region - Areawide Urban Storm Water Runoff - Orange County (MS4 permit)	R8-2002-0010	CAS618030
3	National Pollutant Discharge Elimination System (NPDES) Permit Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans)	99-06-DWQ	CAS000003
4	General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (de minimus) Threat to Water Quality	R8-2003-0061 as amended by R8-2005-0041 and R8-2006-0004	CAG998001
5	General Waste Discharge Requirements for Short-term Groundwater-Related Dischargers and De Minimus Wastewater Discharges to Surface Waters Within the San Diego Creek/Newport Bay Watershed	R8-2004-0021	CAG998002
6	General Groundwater Cleanup Permit for Discharges to Surface Waters of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents and/or Petroleum Hydrocarbons mixed with Lead and/or Solvents	R8-2002-0007, as amended by R8-2003-0085 and R8-2005-0110	CAG918001
7	Waste Discharge Requirements for City of Tustin's 17th Street Desalter	R8-2002-0005	CA8000305
8	Waste Discharge Requirements for City of Irvine, Groundwater Dewatering Facilities, Irvine, Orange County,	R8-2005-0079	CA8000406
9	Waste Discharge Requirements for Bordiers Nursery, Inc.	R8-2003-0028	
10	Waste Discharge Requirements Hines Nurseries, Inc.	R8-2004-0060	
11	Waste Discharge Requirements for El Modeno Gardens, Inc., Orange County	R8-2005-0009	
12	Waste Discharge Requirements for Nakase Bros. Wholesale Nursery, Orange County	R8-2005-0006	

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Phase I Implementation

Task 1: WDRs and NPDES Permits

The Regional Board shall review and revise, as necessary, existing NPDES permits and/or WDRs to incorporate the appropriate TMDL WLAs, compliance schedules, and monitoring program requirements. These permits are identified in Table NB-OCs-14. The appropriate TMDL WLAs, compliance schedules and monitoring program requirements shall be included in new NPDES permits/WDRs. The NPDES permits/WDRs shall specify TMDL-related provisions that apply provided that: (1) the dischargers are and remain members of the Working Group (see Task 7); and (2) the approved Work Plan developed by the Working Group is implemented in a timely and effective manner. The NPDES permit/WDRs shall also include TMDL-related provisions that apply if the discharger(s) do not participate or discontinue participation in the Working Group and/or if the approved Work Plan is not implemented effectively or in a timely manner.

Compliance with the TMDLs and wasteload allocations is to be achieved as soon as possible, but no later than (*seven years from the date of OAL approval of this BPA*). The way that this deadline applies to a particular discharger differs depending on whether the discharger is participating in the Working Group:

1. Working Group Participants. Provisions in NPDES permits/WDRs issued during implementation of the Work Plan will specify the following for Working Group members:

(a) Interim effluent limitations. Participation in the Working Group and timely and effective implementation of the Regional Board-approved Work Plan will constitute interim, performance-based effluent limitations to implement the wasteload allocations. Adhering to these interim effluent limitations satisfies the requirement, during the Work Plan implementation period, to achieve compliance with the TMDLs and wasteload allocations "as soon as possible."

(b) Final effluent limitations. Final effluent limitations based on the wasteload allocations will also be specified, with a schedule requiring compliance as soon as possible but no later than *(seven years from the date of OAL approval of this BPA)*.[2] Compliance with the interim, performance-based limitations will fulfill the "as soon as possible" requirement. The NPDES permits/WDRs will specify further that the status of compliance with the final effluent limitations based on the wasteload allocations will be reviewed on an annual basis. Compliance with these limitations will be required prior to the completion of the Work Plan tasks, in accordance with a schedule approved by the Regional Board's Executive Officer, if it is demonstrated to the satisfaction of the Executive Officer that such earlier compliance is reasonably feasible.

[2] It is recognized that this schedule may exceed the five year terms of NPDES permits. This schedule will be reflected in subsequent renewals of these NPDES permits.

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Following the completion of the Work Plan tasks, NPDES permits/WDRs will require dischargers to comply with wasteload allocations in the shortest practicable time, but in no event later than *(seven years from the date of OAL approval of this BPA)*.

2. Non-Working Group Dischargers. For dischargers not participating in the Working Group, NPDES permit/WDR provisions will require compliance with the wasteload allocations as soon as possible after adoption of NPDES permits/WDRs that implement the TMDLs, but no later than (*seven years from the date of OAL approval of this BPA).* In this case, the determination of what constitutes "as soon as possible" will be at the discretion of the Regional Board's Executive Officer.

Completion of the Work Plan and/or other investigations conducted by the Regional Board or others may result in modification of the TMDLs, wasteload allocations and the compliance schedule through the Basin Planning process. Subsequent issuance/revision of NPDES permit/WDRs will implement any such changes.

Ultimate compliance with permit limitations based on wasteload allocations is expected to be based upon iterative implementation of effective BMPs to manage the discharge of fine sediments containing organochlorine compounds, along with monitoring to measure BMP effectiveness.

Permit revisions shall be accomplished as soon as possible upon approval of these TMDLs. Given Regional Board resource constraints and the need to consider other program priorities, permit revisions are likely to be tied to renewal schedules.

For commercial nurseries covered under existing WDRs, revisions of these WDRs shall address the following identified needs:

(1) Evaluation of sites to determine/verify potential storm water and nonstorm water discharge locations;
(2) Evaluation of current monitoring programs and methods of sampling and analysis for consistency with other monitoring efforts in the watershed;
(3) In cooperation with U .C. Cooperative Extension, evaluation of BMPs for adequacy and implementation of the most effective BMPs to reduce/eliminate the discharge of potentially-contaminated fine sediments in both storm water and non-storm water discharges;
(4) Monitoring to better quantify nursery runoff as a potential source of organochlorine compounds and to assure that load reductions are achieved; and
(5) Based on the results of the preceding tasks, development of a workplan to be submitted within one month of the effective date of these TMDLs that identifies: (a) the BMPs implemented to date and their effectiveness in reducing fine sediment and organochlorine compound discharges; (b) the adequacy and consistency of monitoring efforts, and proposed improvements; (c) a plan and schedule for implementation of revised

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BMPs and monitoring protocols, where appropriate. It is recognized that most nursery operations are likely to be of very limited duration due to the expiration of land leases. The workplan shall identify recommendations for BMP and monitoring improvements that are effective, reasonable and practicable, taking this consideration into account. This workplan shall be implemented upon approval by the Regional Board Executive Officer.

Revisions to the Municipal Separate Storm Sewer System (MS4) permit (R8-2002-0010, NPDES No. CAS618030), including the monitoring program shall address the monitoring and BMP-related tasks identified below, as appropriate. The Regional Board will coordinate also with the State Water Resources Control Board regarding revision of the Caltrans permit to address these monitoring and BMP-related tasks. These include: oversight and implementation of construction BMPs (Task 4); organochlorine compound source evaluations (Task 5); assessment of dredging feasibility and identification of a funding mechanism (Task 6); and, revision of the regional monitoring program (Task 8).

NPDES permits that regulate discharges of ground water to San Diego Creek or its tributaries shall be reviewed and revised as necessary to require annual (at a minimum) monitoring, using the most sensitive analytical techniques practicable, to analyze for organochlorine compounds in the discharges. If organochlorine compounds are found to be present, the dischargers shall be required to evaluate whether and to what extent the discharges would cause or contribute to an exceedance of wasteload allocations and to implement appropriate measures to reduce or eliminate organochlorine compounds in the discharges. New NPDES permits issued for these types of discharges shall incorporate the same requirements.

These dischargers (nurseries, MS4 permittees, Caltrans, ground water dischargers) may address the specific requirements identified above through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

Task 2: Develop and Implement an Agricultural BMP and Monitoring Program

Apart from certain nurseries, agricultural operations in the watershed are not currently regulated pursuant to waste discharge requirements. The SWRCB's "Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program" (Nonpoint Source Policy) (2004) requires that all nonpoint source dischargers be regulated under WDRs, waivers of WDRs, Basin Plan prohibitions, or some combination of these three administrative tools. Board staff is developing recommendations for an appropriate regulatory approach to address agricultural discharges. It is expected that the Regional Board will be asked to consider these recommendations and to approve a regulatory approach in late 2007. Appropriate load allocations to implement these TMDLs will be included in WDRs or a waiver of

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WDRs, if and when issued by the Regional Board to address discharges from agricultural operations.

In the interim, agricultural operators shall identify and implement a monitoring program to assess OCs discharges from their facilities, and identify and implement a BMP program designed to reduce or eliminate those discharges. The proposed monitoring and BMP program shall be submitted as soon as possible but no later than (*3 months from OAL approval of this Basin Plan Amendment (BPA)*). These monitoring and BMP programs will be components of the waste discharge requirements or conditional waiver of waste discharge requirements that Board staff will recommend to implement the Nonpoint Source Policy. Load allocations identified in these TMDLs will also be specified in the WDRs/waiver, with a schedule of compliance.

It is recognized that most agricultural operations are expected to be of very limited duration due to the expiration of land leases. The monitoring and BMP programs proposed by the agricultural operators should include recommendations that are effective, reasonable and practicable, taking this consideration into account. The BMP and monitoring programs shall be implemented upon approval by the Regional Board. The BMP and monitoring programs may be implemented individually or by a group or groups of agricultural operators.

In addition, responsible parties may address these BMP/monitoring program requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7). WDRs or conditional waivers of WDRs issued to agricultural operators pursuant to the Nonpoint Source Policy shall specify that for those operators who participate in the development and implementation of a Regional Board approved Work Plan, compliance with the TMDLs and load allocations is to be achieved as soon as possible, but no later than *(seven years from the date of OAL approval of this BPA)*. The way that this deadline applies to a particular agricultural operator differs depending on whether the operator is participating in the Working Group:

1. Working Group Participants. Provisions in WDRs or conditional waivers of WDRs issued during implementation of the Work Plan will specify the following for Working Group members:

(a) Interim limitations: Participation in the Working Group and timely and effective implementation of the Regional Board-approved Work Plan will constitute interim, performance-based limitations to implement the load allocations. Adherence to these interim limitations satisfies the requirement, during the Work Plan implementation period, to achieve compliance with the TMDLs and load allocations "as soon as possible."

(b) Final limitations: Final limitations based on the load allocations will also be specified in the WDRs/waivers, with a schedule requiring compliance as soon as

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possible but no later than (*seven years from the date of OAL approval of this BPA*). Compliance with the interim, performance-based limitations will fulfill the "as soon as possible" requirement. The WDRs/waivers will specify further that the status of compliance with the final limitations based on the load allocations will be reviewed on an annual basis. Compliance with these limitations will be required prior to the completion of the Work Plan tasks, in accordance with a schedule approved by the Regional Board's Executive Officer, if it is demonstrated to the satisfaction of the Executive Officer that such earlier compliance is reasonably feasible.

Following the completion of the Work Plan tasks, WDRs/waivers will require agricultural operators to comply with load allocations in the shortest practicable time, but in no event later than *(seven years from the date of OAL approval of this BPA*).

2. Non-Working Group Dischargers. For agricultural operators not participating in the Working Group, provisions in WDR/waivers of WDRs will require compliance with the load allocations as soon as possible after adoption of WDRs/waivers of WDRs that implement the TMDLs, but no later than *(seven years from the date of OAL approval of this BPA)*. In this case, the determination of what constitutes "as soon as possible" will be at the discretion of the Regional Board's Executive Officer.

Completion of the Work Plan and/or other investigations conducted by the Regional Board or others may result in modification of the TMDLs, load allocations and the compliance schedule through the Basin Planning process. Subsequent issuance/revision of WDRs/conditional waivers of WDRs will implement any such changes.

Task 3: Identify Parties Responsible for Open Space Areas; Develop and Implement an OCs Monitoring Program to Assess Open Space Discharges; Develop and Implement an OCs BMP Program, if Necessary

Nonpoint source discharges from open space are also subject to State regulation. During Phase I of these TMDLs, sufficient data shall be collected by the responsible parties to determine whether discharges of OCs from designated open space, as well as discharges resulting from erosion in and adjacent to unmodified streams, are causing or contributing to exceedances of water quality objectives and/or impairment of beneficial uses of San Diego Creek and Newport Bay. With the assistance of the stakeholders, Regional Board staff will identify the responsible parties as soon as possible but no later than (*one month from OAL approval of this BPA*). Board staff will notify the identified responsible parties of their obligation to propose an organochlorine compound monitoring program within two months of notification. The monitoring program shall be implemented upon Regional Board approval.

Based on the results of this monitoring program, the responsible parties shall develop a BMP implementation plan within 6 months of notification by the Regional

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Board's Executive Officer of the need to do so. The responsible parties shall implement that plan upon Regional Board approval.

The responsible parties may address these monitoring and BMP implementation program requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

The Regional Board will consider whether WDRs or a WDR waiver is necessary and appropriate for responsible parties not currently regulated, based on the monitoring results. WDRs or a WDR waiver, if issued, will include appropriate load allocations to implement these TMDLs. For responsible parties compliance with the TMDLs and load allocations is to be achieved as soon as possible, but no later than *(seven years from the date of OAL approval of this BPA)*. The way that this deadline applies to a particular responsible party differs depending on whether that responsible party is participating in the Working Group:

1. Working Group Participants. Provisions in WDRs or conditional waivers of WDRs issued during implementation of the Work Plan will specify the following for Working Group members:

(a) Interim limitations: Participation in the Working Group and timely and effective implementation of the Regional Board-approved Work Plan will constitute interim, performance-based limitations to implement the load allocations. Adherence to the interim, performance-based limitations satisfies the requirement, during the Work Plan implementation period, to achieve compliance with the TMDLs and load allocations "as soon as possible."

(b) Final limitations: Final limitations based on the load allocations will also be specified in the WDRs/waivers, with a schedule requiring compliance as soon as possible but no later than (*seven years from the date of OAL approval of this BPA)*. Compliance with the interim, performance-based limitations will fulfill the "as soon as possible" requirement. The WDRs/waivers will specify further that the status of compliance with the final limitations based on the load allocations will be reviewed on an annual basis. Compliance with the final limitations will be required prior to the completion of the Work Plan tasks, in accordance with a schedule approved by the Regional Board's Executive Officer, if it is demonstrated to the satisfaction of the Executive Officer that such earlier compliance is reasonably feasible.

Following the completion of the Work Plan tasks, WDRs/waivers will require responsible parties to comply with load allocations in the shortest practicable time, but in no event later than *(seven years from the date of OAL approval of this BPA)*.

2. Non-Working Group Dischargers. For responsible parties not participating in the Working Group, compliance with the load allocations will be as soon as possible after TMDLs adoption and approval, but no later than *(seven years from the date of*

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OAL approval of this BPA). In this case, the determination of what constitutes "as soon as possible" will be at the discretion of the Regional Board's Executive Officer.

Completion of the Work Plan and/or other investigations conducted by the Regional Board or others may result in modification of the TMDLs, load allocations and the compliance schedule through the Basin Planning process. Subsequent issuance/revision of WDRs/conditional waivers of WDRs will implement any such changes.

Task 4: Develop and Implement Appropriate BMPs for Construction Activities

Currently, all construction activities in the watershed are regulated under the State Water Resource Control Board's (SWRCB) General Permit for Discharge of Storm Water Runoff Associated with Construction Activity (Order No. 99-08-DWQ, NPDES No. CAS000002; the "General Construction Permit"), SWRCB National Pollutant Discharge Elimination System (NPDES) Permit Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans) (Order No. 99-06-DWQ, NPDES No. CAS000003; the Caltrans MS4 permit), and/or the Orange County MS4 NPDES permit. The requirements of these permits and an iterative, adaptive-management BMP approach, coupled with monitoring, are the foundation for meeting the TMDL WLAs for construction. The General Construction Permit, and the Orange County and Caltrans MS4 permits are expected to be revised over time. The specific tasks identified below may be addressed by revisions to one or more of these permits. In that case, the Regional Board will integrate requirements for implementation of this Task with the requirements of the Orange County and Caltrans MS4/General Construction permits so as to prevent conflict and/or duplication of effort.

To assure that effective construction BMPs are identified and implemented, program improvements are needed in the following areas: (a) Storm Water Pollution Prevention Plans (SWPPPs) prepared in response to the General Construction Permit must include supporting documentation and assumptions for selection of sediment and erosion control BMPs, and must state why the selected BMPs will meet the Construction WLAs for the organochlorine compounds; (b) SWPPP provisions must be rigorously implemented on construction sites; (c) sampling and analysis for the organochlorine pesticides and PCBs in storm and nonstorm discharges containing sediment from construction sites is necessary to determine the efficacy of BMPs, as well as compliance with the construction WLAs; sampling and analysis plans must be included in SWPPPs; (d) additional BMPs, including enhanced BMPs, must be evaluated to determine those that may be appropriate for reducing or eliminating organochlorine compound discharges from construction sites (e.g., BMPs effective in control of fine particulates) without significant adverse environmental effects (e.g., toxicity that might result from improper storage and/or application of polymers); (e) outreach is necessary to assure the effective implementation of these SWPPP requirements; and (e) enforcement of the SWPPP requirements is necessary.

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To address these program improvements, Regional Board staff shall develop a SWPPP Improvement Program that identifies the Regional Board's expectations with respect to the content of SWPPPs, including documentation regarding the selection and implementation of BMPs, and a sampling and analysis plan. The Improvement Program shall include specific guidance regarding the development and implementation of monitoring plans, including the constituents to be monitored, sampling frequency and analytical protocols. The SWPPP Improvement Program shall be completed by (*the date of OAL approval of this BPA*). No later than two months from completion of the Improvement Program, Board staff shall assure that the requirements of the Program are communicated to interested parties, including dischargers with existing authorizations under the General Construction Permit. Existing, authorized dischargers shall revise their project SWPPPs as needed to address the Program requirements as soon as possible but no later than (*three months of completion of the SWPPP Improvement Program*). Applicable SWPPPs that do not adequately address the Program requirements shall be considered inadequate and enforcement by the Regional Board shall proceed accordingly. The Caltrans and Orange County MS4 permits shall be revised as needed to assure that the permittees communicate the Regional Board's SWPPP expectations, based on the SWPPP Improvement Program, with the Standard Conditions of Approval.

The MS4 permittees shall conduct studies to evaluate BMPs that are most appropriate for reducing or eliminating organochlorine compound discharges from construction sites (e.g., fine particulates), including advanced treatment BMPs. The evaluation shall consider the potential for adverse environmental effects associated with implementation of each of the BMPs identified. MS4 Permittees shall include these BMPs in the Orange County Stormwater Program Construction Runoff Guidance Manual and the Caltrans Storm Water Management Plan (SWMP). Implementation of these MS4 permittee requirements shall commence upon issuance of appropriate Water Code Section 13267 letters or renewal of the MS4 permits, whichever occurs first. The Section 13267 letters/revised permits shall require the permittees to: (a) submit a proposed plan and schedule for studies to evaluate appropriate BMPs, as described above, within three months of issuance of the 13267 letter or permit revision; (b) implement the plan and schedule upon approval by the Regional Board's Executive Officer; (c) submit a report of the BMP investigations within 6 months of approval of the study plan, provided that sufficient storms, as defined in the study plan, have occurred within that period. If the number of storms does not conform to the study plan, then the report shall be submitted in accordance with a schedule approved by the Executive Officer once the requisite number of storms has occurred. The report shall include a proposed plan and schedule for implementation of the BMPs, as appropriate, and inclusion of the BMPs in the Orange County Guidance Manual and in the Caltrans SWMP and related guidance documents; (d) implement the BMP plan upon approval by the Executive Officer.

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The MS4 permittees may address these SWPPP and construction site BMP-related requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

Task 5: Evaluate Sources of OCs to San Diego Creek and Newport Bay; Identify and Implement Effective BMPs to Reduce/Eliminate Sources

Based on the regional monitoring program being implemented by the Orange County MS4 permittees and/or on the results of other monitoring and investigations, all MS4 permittees shall conduct source analyses in areas tributary to the MS4 system demonstrating elevated concentrations of OCs. Based on mass emissions monitoring (described below) and source analysis, the permittees shall implement additional/enhanced BMPs as necessary to ensure that organochlorine discharges from significant land use sources to surface waters are reduced or eliminated. As part of the investigation task, if the results indicate that additional OCs soil remediation is necessary on MCAS Tustin and MCAS El Toro, the responsible parties for such remediation will be identified. The responsible party will be tasked to implement those portions of the BMP plan identified for the responsible party for MCAS Tustin and MCAS El Toro.

The permittees shall develop and implement a collection program for all banned OC pesticides and PCBs. This type of program has had demonstrated success in other geographic areas in collecting and disposing of banned pesticides. Residents and businesses in the watershed may have stored legacy pesticides that could be collected through such a program; if this is the case, this task would prevent future use and improper disposal of these banned pesticides.

Implementation of these requirements shall commence upon issuance of appropriate Water Code Section 13267 letters or approval of an appropriately revised MS4 permits, whichever occurs first. Revisions to the Orange County MS4 permit and Caltrans SWMP shall implement requirements specified in applicable Section 13267 letters, if used to implement TMDL-related requirements. The 13267 letters/revised permit shall specify require the permittees to: (a) submit a proposed plan and schedule for source analyses of MS4 tributary areas with elevated OCs concentrations within 3 months of issuance of the 13267 letters or permit revision: (b) implement the proposed plan upon approval by the Regional Board's Executive Officer; (c) submit a report within 6 months of completion of the approved study plan. The report shall provide the study results and include a proposed plan and schedule for prioritized implementation of BMPs in OCs source areas; (d) implement the BMP plan upon Executive Officer approval.

The permittees may address these requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (Task 7).

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Task 6: Evaluate Feasibility and Mechanisms to Fund Future Dredging Operations

Because large-scale erosion and sedimentation primarily occurs during large storm events, traditional BMPs may have limited success in reducing/eliminating the discharge of potentially-contaminated sediments to receiving waters during wet weather. In such cases, dredging within Newport Bay and/or San Diego Creek may be the most feasible and appropriate method of reducing OCs loads in these waters. However, the feasibility and effectiveness of dredging projects in removing OCs would require careful consideration, since dredging may or may not expose sediments with higher concentrations of OCs. Financing of such projects is also a significant consideration.

Entities discharging potentially contaminated sediment in the watershed shall analyze the feasibility of dredging to achieve water quality standards, and shall identify funding mechanisms for ensuring that future dredging operations can be performed, as necessary, within San Diego Creek, Upper and Lower Newport Bay. A report that presents the results of this effort shall be submitted no later than (*three years from the date of OAL approval of this BPA).* It is recognized that dredging activities are likely to be an integral part of efforts to comply with other established TMDLs, particularly the sediment TMDL. Ideally, dredging feasibility and funding investigations would be integrated with implementation and review of the sediment TMDL through the comprehensive Work Plan (Task 7). The responsible parties may address this Task requirement through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan.

Task 7: Develop a Comprehensive Work Plan to Meet TMDL Implementation Requirements, Consistent with the Adaptive Management Approach

During the development of these organochlorine compounds TMDLs, regulated stakeholders in the Newport Bay watershed expressed concerns that the numeric targets used to develop the TMDLs, wasteload allocations and load allocations were flawed and that scientific review by an independent panel of experts was necessary. Further, these stakeholders suggested that pollutants other than the organochlorine compounds, such as metals, pyrethrins or other, emerging pollutants may pose the more real or significant threat to beneficial uses in the watershed. Finally, it was recommended that an integrated approach to TMDL implementation, and to the development of pending TMDLs and refinement of established TMDLs, would be a more effective and efficient approach.

Substantial efforts are already being made by many stakeholders in the watershed to address established permit and/or TMDL requirements for BMP implementation and monitoring and to conduct special investigations to understand and improve water quality conditions in the watershed. Thus, the framework exists to develop a

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comprehensive watershed plan for addressing water quality, not only as it relates to the organochlorine compounds, but on a larger scale that encompasses all sources of water quality impairment.

This implementation plan provides the opportunity for regulated stakeholders to form a Working Group and to participate in the development and implementation of a comprehensive Work Plan to evaluate the scientific basis of these organochlorine TMDLs, to prioritize TMDL implementation tasks, to integrate implementation with other TMDL and/or permit requirements, and to investigate unknown sources of toxicity in the watershed. As noted in the previous Task descriptions, participation by responsible parties in the Working Group and the development and implementation of a Regional Board Work Plan would address the responsible parties' obligations pursuant to the Tasks in Table NB-OCs-13. Dischargers who elect not to participate in the Working Group/Work Plan will be required to implement these Tasks, as described above.

Dischargers interested in participating in a Working Group to develop and implement a comprehensive Work Plan must commit to do so by (*within one month of OAL approval of the BPA*). Submittal of a draft Work Plan is required no later than (*three months of OAL approval of the BPA*). The schedules for implementation of the tasks identified in the Work Plan must reflect the shortest practicable time necessary to complete the tasks. Implementation of the Work Plan will commence upon approval of the Work Plan by the Regional Board at a properly noticed public hearing. Execution of the Work Plan must be complete within five years of Regional Board approval. Substantive changes to the tasks and schedules included in the approved Work Plan are contingent on Regional Board approval at a subsequent, properly noticed public hearing(s). However, the Regional Board's Executive Officer is authorized to revise the approved tasks and schedules if no significant comments are received during the public notice period.

At a minimum, the expected result of the execution of the Work Plan is a comprehensive, watershed plan for BMP implementation, monitoring, special investigations and other actions that will assure compliance with the OCs TMDLs, as they may be amended, as soon as possible after completion of execution of the Work Plan but no later than *(seven years from the date of OAL approval of this BPA)*[3].

The specific detailed Work Plan tasks and schedules will be determined as the Work Plan is developed. Regional Board staff will work with the Working Group to identify a suitable Work Plan. Key initial tasks are expected to include the following:

1. Convene an Independent Advisory Panel (IAP) of experts with relevant expertise. To avoid questions of objectivity, the panel shall be convened by a neutral third party organization such as the National Water Research Institute. The Working Group and Regional Board staff will work together to define the

[3] This compliance date is subject to change through the Basin Planning process.

desired qualifications needed for IAP participants, define the scope and authority of the IAP, and identify and describe the primary issues that will require guidance, recommendations, or specific actions from the IAP.

2. Re-evaluate OCs TMDLs Numeric Targets and Loads

With input and recommendations from the IAP, and using data being generated through ongoing scientific investigations in the watershed, the Work Plan should assess the current OCs TMDLs numeric targets, evaluate potential alternative numeric targets, and determine if the current targets should be revised, or whether targets based on site-specific data can be developed. If site-specific targets can be developed, the process or methods that will be used to develop targets should be determined, such as risk assessments or re-calculation of targets using accepted, peer-reviewed scientific methodologies.

It is recognized that there is a need for flexibility to respond to unanticipated findings and events, and to changes that may be recommended by the Independent Advisory Panel (see below). However, at a minimum, each of the Tasks identified in Table NB-OCs-13 (except Task 1, which requires action by the Regional Board, and Task 4, which requires action by the Regional Board and the MS4 permittees based on established MS4 permit requirements) must be considered in Work Plan development and implementation. If one or more of these tasks is not proposed for inclusion in the Work Plan, or where modifications of these tasks/schedules are recommended, a written description and justification must be provided with the draft Work Plan submittal. In addition, consideration shall be given to the following:

Develop conceptual models

Data interpretation and monitoring must be organized around a systematic conceptual view of the sources of the different organochlorine compounds and their distribution and behavior in the watershed. Development of conceptual models for these compounds would significantly enhance our understanding of their sources and impacts and would help to structure hypothesis development, monitoring design, and data interpretation. Development of the conceptual models should be based on a review of available data and information about the OCs in the watershed, and the models should be updated as new information accumulates. Characterization of sources and of habitats at risk should be based on a review of available data, framed in terms of the conceptual models and supported with the collection of new data as needed. It is expected that the IAP would provide critical review and recommendations in this process.

Develop Information Management System

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Different types of data – water column, sediment, fish or bird egg tissue, infaunal surveys, hydrology, etc. – are being or will be collected throughout the Newport Bay watershed through a variety of studies, monitoring programs, or other projects. Since these data are often collected for different purposes (e.g., in response to various TMDLs and/or permits), at different times and in different areas, much of the data may be in non-comparable formats, redundant, or not spatially or temporally compatible. In order to determine what data are useful or significant, where data gaps may still occur, or where current data needs are sufficient, a comprehensive information management system should be developed that (1) establishes clear procedures for assessing data quality for data acquisition and transfer and for control of evolving versions of datasets; (2) is a relational database that can manage the variety of data types and has appropriate mechanisms for ensuring and maintaining data quality; (3) can conduct quality control checks and needed reformatting to ensure needed consistency across all data types and sources as data from other sources are obtained; (4) provides for straightforward query and data sub-setting routines to streamline access to the data; and (5) ensures that GIS capability is available for analysis, modeling, and presentation purposes. Development of a comprehensive information management system will allow for the identification of significant data gaps that need to be addressed and will provide a vehicle for establishing monitoring guidelines and preventing redundant or superfluous data collection.

To the extent that there are any conflicts between the individual tasks and schedules identified in Table NB-OCs-13, and the prioritized plan and schedule identified in the Work Plan, the Work Plan would govern implementation activities with respect to the stakeholders responsible for Work Plan development and implementation as part of the Working Group.

Task 8: Revise Regional Monitoring Program

The County of Orange, as Principal Permittee under the County's MS4 permit, oversees the countywide monitoring program. Implementation of the monitoring program is supported by funds shared proportionally by each of the Permittees named in the Orange County MS4 permit. Some monitoring requirements identified in this implementation plan are already reflected in the current program.

By (*3 months from OAL approval of BPA),* the Orange County MS4 permittees shall: (1) document each of the current monitoring program elements that addresses the monitoring requirements identified in the preceding tasks; and, (2) revise the monitoring program as necessary to assure compliance with these monitoring requirements.

Review of/revisions to the monitoring program shall address:

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(1) Estimation of mass emissions of chlordane, DDT, PCBs and toxaphene.
(2) Determination of compliance with MS4 wasteload allocations for Upper and Lower Newport Bay, and of status of achievement with the informational wasteload allocations for San Diego Creek for chlordane and PCBs.
(3) Assessment of temporal and spatial trends in organochlorine compound concentrations in water, sediment and tissue samples.
(4) Semi-annual sediment monitoring in San Diego Creek and Newport Bay. Measurements of sediment chemistry in these waters should be evaluated with respect to evidence of biological effects, such as toxicity and benthic community degradation.
(5) Evaluation of organochlorine bioaccumulation and food web biomagnification
(6) Assessment of the degree to which natural attenuation is occurring in the watershed.

Accurately quantifying the very small mass loads that are allowable under these TMDLs will be very challenging; analytical strategies for quantifying loads of the organochlorine compounds must be carefully explored.

Revisions to the monitoring program shall take into consideration the following recommendations provided by members of the Organochlorine Compounds TMDL Technical Advisory Committee (TAC):

(1) The analytical parameters measured need to be established for each matrix of interest (e.g., sediment, tissue, ambient water). The representative list of compounds to be measured needs to be identified (e.g., what chlordane compounds will be measured and summed to represent “total chlordane;” will PCB congeners be measured and summed or will Aroclors?).
(2) Data quality will need to be consistent with the State’s Surface Water Ambient Monitoring Program (SWAMP). Detection limits, accuracy and precision of analytical methods should be adequate to assure the goals of the monitoring efforts can be achieved.
(3) Bioaccumulation/biomagnification in high trophic level predators may not immediately respond to load reductions; appropriate time scales and schedules for monitoring that are supported by empirical data and/or modeling should be established.
(4) Sentinel fish and wildlife species should be selected for monitoring based on home range, life history, size and age.

MS4 permittees may address the requirements specified herein by participation in the Working Group and development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

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Task 9: Conduct Special Studies

The following special studies should be conducted, in addition to the studies already underway in the watershed. This list is based, in part, on recommendations of the technical advisory committee for the organochlorine compounds TMDLs. These studies will be implemented as resources become available, and the results will be used to review and revise these TMDLs. Stakeholder contributions to these investigations are encouraged and would facilitate review of the TMDLs.

(1) Evaluation of sediment toxicity in San Diego Creek and tributaries, and Upper and Lower Newport Bay.

Previous studies have included Toxicity Identification Evaluations (TIEs) that have yielded inconclusive results as to the cause of toxicity in Newport Bay. Sediment toxicity within San Diego Creek is not well-documented or well-understood. There is evidence that pyrethroid compounds may be a significant contributor. In determining the extent to which nonpolar organic compounds are causing or contributing to sediment toxicity, the differential contribution of both the organochlorine compounds and pyrethroids should be determined to assure that control actions are properly identified and implemented. Monitoring should be performed year-round at multiple locations within San Diego Creek and Newport Bay (to encompass spatial and temporal variability), and should include various land use types in order to quantify the relative contributions from various sources.

(2) Refinement of sediment and tissue targets.

A study is being conducted by the San Francisco Estuary Institute to develop indicators and a framework for assessing the indirect effects of sediment contaminants. The objective is to provide methodology that will assist in evaluating indirect adverse biological effects for bioaccumulative pollutants (e.g. due to food web biomagnification), as part of the overall goal of developing statewide sediment quality objectives. Newport Bay is being used as a case study to show how the proposed methodology could be implemented on a screening level. Multiple lines of evidence will be evaluated to determine impacts of organochlorine pesticides and PCBs to humans and wildlife. A conceptual foodweb model will be developed, and sensitive wildlife receptors will be identified. Empirical field data and a steady-state food web model will be used to calculate bioaccumulation factors for the organochlorine compounds. The bioaccumulation factors will be combined with effects thresholds to identify sediment concentrations that are protective of target wildlife and humans.

Once completed by SFEI, a thorough evaluation of the Newport Bay case study needs to be initiated, and any additional analyses required for a more in-depth risk analysis should be identified and completed. Protective sediment and tissue targets

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for indirect effects to humans and wildlife should be developed by the time the TMDLs are re-opened. Furthermore, once TIEs have identified the likely toxicant(s) responsible for sediment toxicity in San Diego Creek and Newport Bay (direct effects), field and laboratory studies should be conducted in order to determine bioavailability and the dose-response relationship between sediment concentrations and biologic effects.

(3) Evaluation of regional BMPs (e.g., constructed wetlands and sediment detention basins) for mitigating potential adverse water quality impacts of sediment-associated pollutants (e.g., OCs, pyrethroids).

Large-scale, centralized BMPs such as constructed wetlands and storm water retention basins may be more effective than project-level BMPs in reducing adverse environmental impacts of sediment-borne pollutants. Regional BMPs are either being planned or are in place within the watershed (e.g., IRWD NTS). Their potential effectiveness for capturing the organochlorine compounds and mitigating impacts needs to be evaluated.

(4) Improvement in linkage between toxaphene measured in fish tissue and toxaphene in bed sediments.

The toxaphene impairment listing for San Diego Creek is based on fish tissue exceedances that have no measured linkage with toxaphene in sediments. While sediment is the primary TMDL target for these TMDLs, toxaphene is usually not detected in sediment. Because of its chemical complexity, there is a large degree of analytical uncertainty with measurements of toxaphene in environmental samples that use standard methods (e.g., EPA Method 8081a), especially at low levels. Confirmations of toxaphene in fish and sediment samples in San Diego Creek (and possibly Newport Bay) using other techniques (e.g., GC-ECNI-MS or MS/MS) is recommended.

(5) Evaluation of relative importance of continuing OCs discharges to receiving waters through erosion and sedimentation processes, versus recirculation of existing contaminated bed sediments, in causing beneficial use impairment in San Diego Creek and Newport Bay.

This study should allow for determination of the most effective implementation strategies to reduce organochlorine compounds in the MS4 and other receiving waters.

Phase II Implementation

Task 10: TMDL Reopener

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These TMDLs will be reopened no later than (*five (5) years following OAL approval of this BPA*) in order to evaluate the effectiveness of Phase I implementation. At that time, all new data will be evaluated and used to reassess impairment, BMP effectiveness, and whether modifications to the TMDLs are warranted. If BMPs implemented during Phase I have been shown to be ineffective in reducing levels of organochlorine compounds, then more stringent BMPs may be necessary during Phase II implementation.

Implementation of these TMDLs and the schedule for implementation are very closely tied with other TMDLs that are currently being implemented in the watershed. The sediment TMDL allowable load for San Diego Creek was the basis for calculating organochlorine compound loading capacities. The sediment TMDL is scheduled for revision in 2007; changes to the sediment TMDLs will likely necessitate changes to these organochlorine compounds TMDLs as well.

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