

**CENTRAL OC WMA IRWMP
RANKED PROJECT LIST
UPDATED NOVEMBER 2012**

CENTRAL ORANGE COUNTY PRIORITIZATION LIST 2010



UPDATED NOVEMBER 2012

ID #	PROJECT TITLE	LEAD AGENCY (if not submitting)	COLLABORATING STAKEHOLDERS	COST	DESCRIPTION	REGULATORY COMPLIANCE Total	STATE OBJECTIVES Total	REGIONAL / LOCAL OBJECTIVES Total	PROJECT FACTORS Total	OVERALL TOTAL	RANK
62	ID_62 Buck Gully Restoration	Newport Beach, City of	City of Newport Beach	\$1,500,000	Reduce sediment loads, Erosion Control and Bank Stabilization, Riparian Corridor Restoration Construction of Natural Treatment System at Poppy Lane and Buck Gully to reduce nutrient sediment and bacterial loads entering SWQPA # 32	0.2324	0.0342	0.2681	0.2100	0.7447	1
13	ID_13 Serrano Creek Reaches 2,3, and 4	TBD	Lake Forest,County	\$24,000,000	Construct measures to alleviate bank erosion and flooding and excessive sediment transport to Newport Bay and protect property and lives.	0.2800	0.0486	0.2452	0.1633	0.7371	2
0	Big Canyon Creek Over-Irrigation Reduction Program	Newport Beach, City of		\$250,000	High selenium concentrations found in the water column, sediment and plant & animal tissue may be due to over-irrigation practices that are mobilizing selenium that naturally occur in the Monterey formation. This public outreach and incentives program would target the Big Canyon Creek tributary watershed to encourage property owners to fix leaking irrigation systems, use multipoint irrigation heads and convert to Smartimer controllers. Potential benefits include reduced concentration of selenium delivered to Big Canyon Creek via	0.2240	0.0828	0.2083	0.2100	0.7251	4
0	UNB Delhi Channel Water Quality Improvement Project	NBNF	Orange County, Cities of Costa Mesa, Newport Beach, and Santa Ana, NBNF and others	\$5,000,000	This is a project to define in detail all of the water quality issues, flood control and other issues, suggest a holistic program and project solutions that are feasible from a technical, regulatory, political and financial standpoint, develop an overall Conceptual Design for a multi-phase course of action, and to complete a project that addresses issues in the Santa Ana Delhi Channel upstream, instead of at its point of entry into Newport Bay.	0.2632	0.0702	0.2240	0.1050	0.6624	5
0	Natural Treatment System Site 67	IRWD	County of Orange, City of Irvine	\$19,800,000		0.2324	0.0261	0.1711	0.1983	0.6279	6
0	Tustin Legacy Detention Basin	Tustin, City of	City of Tustin	\$2,000,000	Design and construction of an 85 acre ft detention basin to collect storm run off near the intersection of Barranca Parkway/Red Hill Avenue from on site and off site catch basins and streets upstream within the watershed.	0.1064	0.0846	0.2244	0.2100	0.6254	7
188	ID_188 Irvine Boulevard Improvements	Tustin, City of	City of Tustin	\$400,000	Irvine Boulevard is subject to flooding and the City will be adding several storm drains to eliminate this nuisance. The City proposes to install 4 CDS units to capture the trash and debris that enters the storm drain system.	0.2324	0.0441	0.1023	0.1983	0.5771	9
0	UNB Galaxy Habitat Restoration	NBNF	OC Parks, Calif. Dept. of Fish and Game, City of Newport Beach, NBNF and others	\$500,000	This project in the northern half of the area between Dover Shores and the West Bay will focus on restoring/creating coastal sage scrub and grass habitat (particularly cactus wren habitat) to help ameliorate the loss of this habitat in the wildfires in the foothills of the Newport Bay Watershed in the fall of 2007. Project objectives will include slope stabilization, sediment, pesticide and nutrient reduction, invasive species	0.0812	0.0486	0.3155	0.1050	0.5503	10
0	UNB Shellmaker Island Restoration/Education Projects	NBNF	OC Parks, Calif. Dept. of Fish and Game, City of Newport Beach, NBNF and others	\$250,000	Shellmaker Island is part of the DFG Ecological Reserve and home to the Back Bay Science Center. The projects provide multiple benefits including endangered species protection, habitat restoration, ADA trail installation and interpretive station construction, as well as dock and pile wall replacement.	0.0812	0.0657	0.1739	0.2100	0.5308	11
0	Borrego Canyon Wash Stabilization and Restoration (Irvine Blvd)	TBD	Lake Forest,County	\$16,000,000	Borrego Canyon Wash north of Irvine Blvd has experienced substantial stream incision and bank erosion and has been identified as the source of approximately one-half of the sediment discharged to Newport Bay during very wet years. This project will provide stabilization and restoration of the natural alluvial channel system to eliminate future erosion of the streambed and streambank to assist in reducing Borrego Wash as a	0.1260	0.0495	0.2171	0.1167	0.5093	12
0	City of Tustin Well Rehabilitation Program	Tustin, City of	City of Tustin	\$1,600,000	Rehabilitate various City wells (Vandenberg, Columbus-Tustin, 17th Street #4, Main Street #3, Main Street #4, Newport, Prospect and Beneta) to improve production, efficiency, and reliability.						

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						0.0840	0.1422	0.1372	0.1400	0.5034	13
0	Citywide installation of catch basin inserts and purchase of vactor truck	Tustin, City of	City of Tustin	\$2,410,000	Installation of citywide catchbasin inserts and debris screens at remaining locations without those facilities and the purchase of a vactor truck for removal of debris from catch basins and storm drain facilities.	0.1064	0.0432	0.1426	0.2100	0.5022	14
82	ID_82 City of Tustin Main Street RO/IX Facility Improvements	Tustin, City of	City of Tustin	\$150,000	Feasibility study to determine cost effective options for upgrading groundwater treatment process at the City's Main Street Plant which removes nitrates from the ground water.	0.0840	0.0891	0.2183	0.1050	0.4964	16
0	UNB Big Canyon Habitat Restoration	NBNF	OC Parks, Calif. Dept. of Fish and Game, City of Newport Beach, NBNF and others	\$6,500,000	NBNF is currently working with the City and DFG to see if the project permit conditions can be met. If it is agreed that it is impractical to proceed with the project as designed or with minor modifications NBNF will take the lead in exploring less costly options that will address the main flood, water quality, habitat and wildlife issues without relocating the existing freshwater pond or Back Bay Drive. Cost is for Tidal Wetlands.	0.0812	0.0630	0.1739	0.1750	0.4931	17
0	Capacity Enhancements of the Santa Ana-Santa Fe Channel (F10)	Tustin, City of	County of Orange	\$8,000,000	Capacity enhancement and realignment of the Santa Ana-Santa Fe Channel between 500 feet west of and 1,200 feet east of the centerline of FUTURE Newport Avenue.	0.0420	0.0945	0.1928	0.1517	0.4810	18
0	Pomona Street Water Quality and Storm Drain Improvement Project	Costa Mesa, City of	City of Newport Beach, County of Orange	\$3,000,000	Installation of upgraded stormdrain to include treatment and upgrade of bioswale from Pomona Ave to Newport Blvd in the cities of Costa Mesa and Newport Beach.	0.1512	0.0441	0.1534	0.1167	0.4653	20
0	Gowdy Avenue	Lake Forest	0	\$62,740	BMP retrofit improvement project for the street median and parkways including removal of high-water use turf grass, replacement with drought tolerant plant palette, replace irrigation controllers with ET controllers and retrofit irrigation distribution system to provide setbacks and low water emitting/high efficiency heads.	0.1820	0.0513	0.0965	0.1283	0.4581	21
0	Centralized Expansion of Irrigation Control System Civic Center & Parks	Santa Ana, City of	Santa Ana, City of - MWD	\$750,000	Expansion of the City's Smart controller system and tying the irrigation network within the Civic Center and park system to one centrally controlled location	0.1820	0.0234	0.0388	0.2100	0.4542	22
0	Ridge Route Drive	Lake Forest	0	\$845,600	BMP retrofit improvement project for the street median and parkways including removal of high-water use turf grass, replacement with drought tolerant plant palette, replace irrigation controllers with ET controllers and retrofit irrigation distribution system to provide setbacks and low water emitting/high efficiency heads.	0.1820	0.0558	0.0680	0.1283	0.4342	23
0	UNB Comprehensive Risk Management Program Implementation	NBNF	OC Parks, CDFG, CoNB, NBNF, etc.	\$500,000	The CRMP will define specific objectives for the long-term protection of native habitat and wildlife and compatible public use, and specify how best to achieve the objectives, how to monitor progress in achieving those objectives, and how to adapt the objectives or methods to take account of changing conditions and circumstances. This IRWMP Project seeks funding for five years of ongoing CRMP coordination and habitat/wildlife inventory updates at an average annual cost of \$100,000. The ongoing monitoring will be	0.0420	0.0522	0.1519	0.1750	0.4211	24
0	UNB Bayview Habitat Restoration	NBNF	OC Parks, Calif. Dept. of Fish and Game, City of Newport Beach, NBNF and others	\$500,000	A master project to address erosion, sediment, habitat degradation, nesting disturbance, pathogen runoff and other problems resulting from local storm drains, illegal trails and other inappropriate public uses will be initiated through the Comprehensive Resource Management Program for the entire Bay. This project will establish an ecologically-sound system of public access for compatible recreational use. This project will be to complete the master project for the Bayview Project Area, which stretches from the Delhi Channel to Jamboree and includes nearly 30 acres of upper saltmarsh, fresh water marsh, riparian, coastal sage scrub and grassland habitat within the Upper Newport Bay Ecological Reserve and Nature Preserve.	0.0812	0.0540	0.1739	0.1050	0.4141	25
0	UNB Watershed Data Catalog	NBNF	OC Parks, Calif. Dept. of Fish and Game, City of Newport Beach, NBNF and others	\$250,000	A single Comprehensive Resource Management Program (CRMP) is being developed to achieve the holistic adaptive management of Upper Newport Bay and surroundings. Over 1000 studies, reports, etc. containing relevant scientific and other data have been cataloged, and gaps identified that will be filled as part of the development of the CRMP. The Watershed Data Catalog will provide a vital tool for the cities and other entities in the Newport Bay Watershed to use to help accomplish a more cost-effective approach to all natural resource and water quality projects in watershed.	0.0420	0.0522	0.1403	0.1750	0.4095	26

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0	UNB San Joaquin Hills Road Habitat Restoration	NBNF	OC Parks, Calif. Dept. of Fish and Game, City of Newport Beach, NBNF and others	\$750,000	A master project to address erosion, sediment, habitat degradation, nesting disturbance, pathogen runoff and other problems resulting from local storm drains, illegal trails and other inappropriate public uses will be initiated through the Comprehensive Resource Management Program for the entire Bay. This project will establish an ecologically-sound system of public access for compatible recreational use. This project will be to complete the master project for the San Joaquin Hills Road Project Area, which stretches from Big Canyon to the Hyatt and includes over 50 acres of upper saltmarsh, fresh water marsh, riparian, coastal sage scrub and grassland habitat within the Upper Newport Bay Ecological Reserve and Nature Preserve and adjacent city and private land.	0.0812	0.0486	0.1739	0.1050	0.4087	27
67	ID_67 County-Wide Pharmaceutical No Drugs Down Drain	Orange County Sanitation District	Orange County Sanitation District	\$100,000	Implementation of collection sites for unused pharmaceuticals/Education Program to Reduce of Pharmaceuticals disposed by general public into the sewer system	0.0000	0.0522	0.1928	0.1633	0.4083	28
0	UNB Eastbluff Habitat Restoration	NBNF	OC Parks, Calif. Dept. of Fish and Game, City of Newport Beach, NBNF and others	\$750,000	A master project to address erosion, sediment, habitat degradation, nesting disturbance, pathogen runoff and other problems resulting from local storm drains, illegal trails and other inappropriate public uses will be initiated through the Comprehensive Resource Management Program for the entire Bay. This project will establish an ecologically-sound system of public access for compatible recreational use. This project will be to complete the master project for the Eastbluff Project Area, which stretches from Lombard to Big Canyon.	0.0840	0.0405	0.1739	0.1050	0.4034	29
30	ID_30 Irvine Wildlife Corridor	Great Park	Great Park	\$46,000,000	Provide a dedicated open space for wildlife migration between natural habitats located within and adjacent to the City of Irvine	0.1092	0.0513	0.1001	0.1400	0.4006	30

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0	UNB Newport Aquatic Center Habitat	NBNF	OC Parks, Calif. Dept. of Fish and Game, City of Newport Beach, NBNF and others	\$500,000	The Newport Aquatic Center is part of the UNB Dover Shores Project Area which is located at the southwest corner of the Upper Newport Bay Ecological Reserve. This project will restore about 5 acres of land and provides multiple benefits including endangered species protection, mudflat creation, oyster bed installation,	0.0812	0.0252	0.1739	0.1167	0.3970	31
60	ID_60 Study of Nutrient Load in Bay and Algae Blooms	Newport Beach, City of	City of Newport Beach	\$450,000	Assess cause of algae blooms and correlation to high nutrients load into the Bay Conduct Cross Contamination Model to evaluate migration of nutrient to SWQPA Jetty modification study Fertilizer management program	0.1932	0.0405	0.1117	0.0467	0.3920	32
0	UNB West Bay Habitat Restoration	NBNF	OC Parks, Calif. Dept. of Fish and Game, City of Newport Beach, NBNF and others	\$5,000,000	A master project to address erosion, sediment, habitat degradation, nesting disturbance, pathogen runoff and other problems resulting from local storm drains, illegal trails and other inappropriate public uses will be initiated through the Comprehensive Resource Management Program for the entire Bay. This project will establish an ecologically-sound system of public access for compatible recreational use. This project will be	0.0812	0.0252	0.1739	0.1050	0.3853	33
0	F06 Peters Canyon Channel - San Diego Creek Channel (F05) Confluence to Barranca Pkwy	OCFCD	0	\$9,800,000	To design and construct the existing deficient channel to convey the 100-year storm event.	0.0812	0.0180	0.1410	0.1400	0.3802	34
0	F06 Peters Canyon Channel - Barranca Pkwy to Warner Ave Phase 1	OCFCD	0	\$8,400,000	To design and construct the existing deficient channel to convey the 100-year storm event.	0.0812	0.0180	0.1269	0.1400	0.3661	35
61	ID_61 Copper Elimination	Newport Beach, City of	City of Newport Beach	\$150,000	Implement boat paint management program to reduce presence of toxic paints in CCA #69, SWQPA #33 and SWQPA #32.	0.1484	0.0405	0.1117	0.0467	0.3472	36
0	F06 Peters Canyon Channel - from Barranca Pkwy to Warner Ave	OCFCD	0	\$8,400,000	To design and construct the existing deficient channel to convey the 100-year storm event.	0.0420	0.0180	0.1410	0.1400	0.3410	37
0	Destruction of Livingston and Pankey Wells	Tustin, City of	City of Tustin	\$75,000	Demolish two abandoned City wells and eliminate potential for contaminating local groundwater basin.	0.0000	0.0189	0.0836	0.2100	0.3125	38
0	Wells 21 and 22	IRWD	0	\$39,768,000		0.0168	0.0162	0.0612	0.2100	0.3042	39
0	South Basin Groundwater Protection Project Interim	OCWD	0	\$2,800,000	Construct interim remediation system, including wells and treatment facilities, to remove contaminated groundwater and contain migration of contaminated groundwater; contaminants in groundwater include	0.0000	0.0225	0.0709	0.2100	0.3034	40
0	Strand Ranch Recovery	IRWD	0	\$7,353,000		0.0000	0.0189	0.0612	0.2100	0.2901	41
0	Colored Water Treatment Facility Technology and Expansion	MCWD	0	\$24,000,000	Replace existing ozone, biologically active filtration process with nanofiltration process and increase capacity from 4,000 gpm to 6,000 gpm to treat colored groundwater	0.0168	0.0432	0.0181	0.2100	0.2881	42
0	F10 Santa Ana-Santa Fe Channel - from Redhill to Confluence with F06	OCFCD	0	\$21,000,000	This channel is currently in a FEMA Special Flood Hazard Area Zone A, AE, and AH. Design and construct channel to convey the 100-year storm event and reduce/contain the 100-year storm event within the channel.	0.0812	0.0090	0.0522	0.1400	0.2824	43
0	F01 Santa Ana-Delhi Channel - from d/s Mesa	OCFCD	0	\$12,350,000	This channel is currently in a FEMA Special Flood Hazard Area Zone A. Design and construct channel to convey the 100-year storm event and reduce/contain the 100-year storm event within the channel.	0.0420	0.0261	0.0730	0.1400	0.2811	44

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0	Dr to Back Bay Syphon Reservoir Integration Project	IRWD	0	\$6,900,000		0.0476	0.0099	0.0939	0.1283	0.2797	45
0	F08 Lane Channel - from Confluence with F05 to downstream Redhill Ave	OCFCD	0	\$15,500,000	This channel is currently in a FEMA Special Flood Hazard Area, Zone A Contained in Channel, and has eroded beyond general maintenance. Repairs of channel improvement magnitude are necessary to bring this channel back to properly conveying the 100-year flood event.	0.0812	0.0090	0.0649	0.1167	0.2718	46
84	ID_84 San Joaquin NTS	IRWD	IRWD	\$2,300,000	Construct a new 10-acre wetland for urban runoff treatment serving the entire San Diego Creek watershed in Central Orange County	0.1512	0.0432	0.0765	0.0000	0.2709	47
0	F02 Santa Ana Gardens Channel - from Alton	OCFCD	0	\$11,200,000	To design and construct this existing deficient channel to convey the 100-year storm event.	0.0812	0.0090	0.0522	0.1167	0.2591	48
282	ID_282 Tustin Avenue Well	Tustin, City of	Tustin	\$4,000,000	Demolition and development of new well. Planned to help city reduce dependence on imported water, increase capacity, and improve reliability	0.0000	0.0351	0.0723	0.1400	0.2474	49
0	D03S03 Gisler Storm Channel - Fairview Street	OCFCD	0	\$7,000,000	To design and construct this existing segment of a deficient channel to convey the 100-year storm event. The upstream and downstream segment have been constructed to convey the ultimate conditions.	0.0000	0.0090	0.0841	0.1400	0.2331	50
0	Syphon Reservoir Expansion Project	IRWD	0	\$70,000,000		0.0476	0.0099	0.0939	0.0467	0.1980	51
29	ID_29 Cienega Filtration Project	IRWD	IRWD	\$25,000,000	Construct a biofilter designed to remove selenium from surface water in the Peters Canyon Channel tributary of San Diego Creek	0.0840	0.0225	0.0545	0.0000	0.1610	52
0	Joint Anaheim/IRWD Well Field	IRWD	City of Anaheim	\$40,000		0.0168	0.0162	0.0612	0.0583	0.1525	53
78	ID_78 District-Wide Recycled Water Expansion Project	IRWD	IRWD	\$6,820,000	Design And Construction Of Expanded Recycled Water Distribution System	0.0000	0.0234	0.0356	0.0000	0.0590	54
81	ID_81 Lake Forest Recycled Water Expansion Project	IRWD	IRWD	\$6,820,000	Expansion of IRWD Recycled Water System into Lake Forest	0.0000	0.0234	0.0356	0.0000	0.0590	55
43	ID_43 Michelson Water Reclamation Plant Flood Wall	IRWD	IRWD	\$7,623,000	Construct flood wall to prevent inundation of MWRP from 200-year flooding from San Diego Creek	0.0000	0.0090	0.0160	0.0000	0.0250	56
48	ID_48 San Diego Creek Levee System FEMA	IRWD	IRWD	\$145,000	Geotechnical Investigation, identification of design, Construction, and maintenance of levees, and certification of levee system. The levees are vital for the protection of the Michelson Water Reclamation Plant	0.0000	0.0090	0.0160	0.0000	0.0250	57
76	ID_76 Baker Pipeline Regional Water Treatment Plant	IRWD	IRWD	\$48,700,000	Construction Of A 25 MGD Microfiltration Plant To Treat Raw Water From Santiago Lateral And/Or Irvine Lake	0.0000	0.0099	0.0000	0.0000	0.0099	58
190	ID_190 County Trash Reduction	Coastkeeper	Santa Ana, Tustin, County	\$355,408	Reduce huge amounts of trash deposited in Delhi Channel, Peters Canyon Wash and tributary channels washed downstream into Newport Bay. Trash problems include degrading water quality, habitat, and recreation opportunities in channels and Newport Bay. Trash collection/disposal imposes significant costs to	0.0000	0.0000	0.0000	0.0000	0.0000	
192	ID_192 Rhine Channel Remediation Project	Coastkeeper	City of Newport Beach, County of Orange		Currently the Rhine Channel is listed on the state impaired waterbodies list for metals and pesticides and has been designated a toxic hot spot by the Santa Ana Regional Water Board. Habitat in the channel is degraded due to sediment contamination and the channel is a source of contaminants found in fish and birds						

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	(Phase 1)			\$4,000,000	throughout the harbor. A TMDL for the Rhine Channel is currently in the development stage. The project will be the first step in solving the problem of highly contaminated sediment in the Rhine Channel by developing the required dredge plans, environmental documents and obtaining the necessary permits for dredging. We will identify the areas of the channel with the highest concentrations of contaminants using the extensive recent data that has been generated by the Rhine Channel Remediation Alternatives Study and by conducting additional sediment monitoring as necessary. This project will provide direct water and sediment quality improvements to the Rhine Channel and help restore the marine habitat beneficial use in the channel and throughout the bay due to healthier fish stocks and reduced transfer of contaminants out of the	0.0000	0.0000	0.0000	0.0000	0.0000	
193	ID_193 Newport Bay Watershed Foothills Infiltration BMP Project	Coastkeeper	Coastkeeper	\$420,481	Newport Bay Watershed has undergone a rapid transformation over the last 20 years from largely agricultural uses to a developed urban area. With development, open land for water to infiltrate has decreased and amount of polluted runoff from homes and industry has increased. Now Borrego Wash, Serrano Creek, San Diego Creek and Newport Bay are in poor condition. Problems include severe downstream channel erosion, riparian habitat degradation, property damage, sediment discharge into Newport Bay, and groundwater recharge. Actions to reduce runoff and pollutants are needed to restore beneficial uses to the creeks and bay. The project goals are to restore the creeks and bay by reducing runoff and pollution, providing benefits to water quality, habitat and dependent species. W/o implementation of project or similar measures, water quality will degrade resulting in the loss of habitat, biota and property. Project will address problems from increased stormwater runoff from urban development in the foothill areas.	0.0000	0.0000	0.0000	0.0000	0.0000	

**CENTRAL OC WMA IRWMP
2012 UNRANKED PROJECT LIST**

2012 Central OC WMA IRWMP
PROJECTS

PROJECT TITLE	SUBMITTING ENTITY	COST	DESCRIPTION	LEAD AGENCY (if not submitting)	COLLABORATING STAKEHOLDERS
Williams Street Storm Drain	City of Tustin	\$ 450,000.00	Installation of a new storm drain and catch basins on Williams Street and the installation of a modular wetland Filterra system		N/A
San Juan Street Storm Drain	City of Tustin	\$ 75,000.00	Develop plans including hydrology and hydraulics analysis to address drainage concerns		N/A
Tustin Village Way Drainage Improvements	City of Tustin	\$ 75,000.00	Develop plans to alleviate drainage concerns including hydrology and hydraulics analysis.		N/A
Yorba Street Storm Drain	City of Tustin	\$ 75,000.00	Installation of storm drain pipe, catch basin, and junction structures and the installation of a modular wetland or Filterra system		N/A
Newport Avenue Extension	City of Tustin	\$ 50,600,000.00	Extension of Newport Avenue and the realignment of the flood control channel. Construction of Newport Avenue from Edinger Avenue to Sycamore Avenue to include 3 lanes each direction using EPA green street manual.		N/A
Santa Ana Delhi Channel Diversion	City of Santa Ana	\$ 4,288,125.00	The proposed project is intended to capture and divert Urban Discharge Low-Flow into the sanitary sewer system.		N/A

**CITY OF NEWPORT BEACH PHASE 2
PROJECT LIST**

CITY OF NEWPORT BEACH
PHASE 2 IRWMP
PROJECT LIST

ID #	Rank	Project Title	Draft Score	PIF?	Lead Agency	Project Category	Cost	Project Type				Description
								Hydrology	Water Quality	Water Supply	Habitat	
277	1	ID_277 Newport Bay Upland Restoration Program (17 Projects)	322	NO	County of Orange and Newport Beach City of Newport Beach	3			X	X	X	combination of projects
62	3	ID_62 Buck Gully Restoration	238	Yes	City of Newport Beach	3	\$ 2,600,000		x		x	Reduce sediment loads, Erosion Control and Bank Stabilization, Riparian Corridor Restoration Construction of
57	8	ID_57 Santa Ana Delhi Channel Repair	207	NO	County, Newport Beach	3	\$ 3,000,000	x	x		x	Stabilize channel banks, introduce native habitat, and create brackish water wetlands
68	13	ID_68 Newport Coast Runoff Reduction Project	186	NO	City of Newport Beach	3	\$ 875,000		x	x	x	Implementation of a Pilot BMP for Dry weather and low wet weather flows that will consist of a treatment train approach. BMP will first remove gross solids and then separate the coarse and fine fractions from the flow using coarse fraction sediment
55	14	ID_55 Santa Ana Delhi Estuarine Wetland Restoration	185	NO	County, Newport Beach, CDFG	3	\$ -		x		x	Phase I (47) is sequenced after Phase II (23)
192	19	ID_192 Rhine Channel Remediation Project (Phase 1)	163	Yes	City of Newport Beach	3	\$ 2,000,000		x			Habitat restoration
258	22	ID_258 Dover Shore Source Control	162	NO	City of Newport beach	3			x			0
191	27	ID_191 Newport Bay Copper Reduction Project	153	Yes	City of Newport Beach	2	\$ 560,000		x		x	Streambed down cutting and canyon bank erosion in Serrano Creek threatens to undermine houses and damage sewer and electrical facilities. The County and other stakeholders are spearheading efforts to stabilize stream banks using eco friendly materials
238	33	ID_238 San Diego Creek-Michelson Fresh Water Marsh	152	NO	City of Newport Beach	3			x		x	The flood management system is a function of the hydrology of the region. When stormwater is directed off of the land into nearby streams, stream flood risk increases, thus increasing the need to reinforce the banks and replace riparian habitat with drain
94	51	ID_94 Big Canyon Creek	137	NO	City of Newport Beach and DFG	3	\$ 4,000,000		x		x	Natural treatment system
58	74	ID_58 Restoration of SWQPA #32 and Ecosystem Impact Metric	111	NO	City of Newport Beach	3	\$ 400,000		x			Removal of Invasive Brown Algae in Rocky Inter-tidal to enhance re-establishment of native algae, Eelgrass restoration, Assessment of Success of ongoing restoration activities and invasive removal program SWQPA Impact Metric Assessment of Potential Impact
73	75	ID_73 Economic value for ecosystem restoration for Big	111	NO	City of Newport Beach	3					x	Conduct a study to Identify Economic value for ecosystem restoration. (Talk to UCI contact for more information)
237	77	ID_237 San Joaquin Hills Habitat Restoration Area	111	Yes	City of Newport Beach	3	\$ 2,000,000		x			Widening of Irvine Avenue where crosses Santa Ana Delhi Channel.
179	80	ID_179 Vista Point Project	110	Yes	City of Newport Beach	3	\$ 70,000				x	0
60	82	ID_60 Study of Nutrient Load in Bay and Algae Blooms	105	Yes	City of Newport Beach	3	\$ 450,000		x		x	Assess cause of algae blooms and correlation to high nutrients load into the Bay Conduct Cross Contamination Model to evaluate migration of nutrient to SWQPA Jetty modification study Fertilizer management program
53	89	ID_53 Bonita Canyon Habitat Linkage	100	NO	Newport Beach, County	3	\$ 1,000,000				x	ET Controllers Programs
249	90	ID_249 Beach Replenishment Project	100	NO	City of Newport Beach	3		x			x	ET Controllers Programs

CITY OF NEWPORT BEACH
PHASE 2 IRWMP
PROJECT LIST

ID #	Rank	Project Title	Draft Score	PIF?	Lead Agency	Project Category	Cost	Project Type				Description
								Hydrology	Water Quality	Water Supply	Habitat	
170	91	ID_170 Santa Isabella Wetland	93	Yes	County of Orange, City of Newport Beach and DFG	3						Planning and education
162	92	ID_162 Aquatic Center Renovation	75	NO	County of Orange and City of Newport Beach	3						
278	96	ID_278 Buck Gully Resource Management Plan	70	NO	City of Newport Beach	1	\$ 200,000	X	X	X	X	
61	97	ID_61 Copper Elimination	65	Yes	City of Newport Beach	3	\$ 1,140,000		X			Implement boat paint management program to reduce presence of toxic paints in CCA #69, SWQPA #33 and SWQPA #32.
66	116	ID_66 Newport Coast Runoff Reduction Project for SWQPA #33	60	NO	IRWD/ City of Newport Beach	3	\$ 2,070,000					Landscape certification
185	126	ID_185 Cherry Lake Section Upgrade Project	51	Yes	City of Newport Beach, Costa Mesa and County of Orange	2						
184	131	ID_184 Santiago Bio Swale Project	42	NO	County of Orange, City of Newport Beach and DFG	3						Habitat restoration low-impact design elements such as bioswales.
281	132	ID_281 Rocky Intertidal Protection Program	41	NO	City of Newport Beach	3	\$ 125,000				X	Habitat rehabilitation by reducing public impacts to the rocky intertidal areas
247	137	ID_247 AP Environmental Sciences Class	22	NO	City of Newport Beach	1		X	X	X	X	
51	138	ID_51 San Diego Creek Watershed-Scale Pesticide Runoff Mitigation	21	NO	City of Newport Beach	1	\$ 400,000					This project will reduce stormwater toxicity in Newport Bay by surveying pesticide use at all large land parcels (parks, shopping centers, golf courses, municipal facilities, educational facilities, etc) and designing & implementing VOLUNTARY BMPs to redu
173	144	ID_173 Horse Arena Project	12	Yes	County of Orange and City of Newport Beach City of Newport Beach	1	\$ 150,000					Water quality

**LINKING EPA'S NINE ELEMENTS TO
CENTRAL WMA IRWMP**

Linking the Central OC Watershed Management Area IRWMP to EPA's nine elements

EPA ELEMENT	Central OC WMA IRWMP Sections
1. Identification of causes of impairment and pollutant sources or groups of similar sources that need to be controlled to achieve needed load reductions, and any other goals identified in the watershed plan. Sources that need to be controlled should be identified at the significant subcategory level along with estimates of the extent to which they are present in the watershed.	Section 3 pages 3-48 through 3-64 in addition to information below
2. An estimate of the load reductions expected from management measures	Section 3 in addition to information below
3. A description of the nonpoint source management measures that will need to be implemented to achieve load reductions in paragraph 2, and a description of the critical areas in which those measures will be needed to implement this plan.	Section 5 Resource Management Strategies
4. Estimate of the amounts of technical and financial assistance needed associated costs, and/or the sources and authorities that will be relied upon to implement this plan.	See information below in addition to Section 8 Finance and Section 9 Technical Analysis
5. An information and education component used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the nonpoint source management measures that will be implemented.	Section 11 Stakeholder involvement in addition to information below.
6. Schedule for implementing the nonpoint source management measures identified in this plan that is reasonably expeditious.	See information below
7. A description of interim measurable milestones for determining whether nonpoint source management measures or other control actions are being implemented.	
8. A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards.	
9. A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item h immediately above.	See information below.

EPA's NINE ELEMENTS for Central IRWMP

A Identification of causes of impairment and pollutant sources or groups of similar sources that need to be controlled to achieve needed load reductions, and any other goals identified in the watershed plan. Sources that need to be controlled should be identified at the significant subcategory level along with estimates of the extent to which they are present in the watershed.

B an estimate of the load reductions expected from management measures

THE INFORMATION BELOW COVERS ELEMENTS A AND B

Several water bodies in the COCWMA are listed on the Clean Water Act 303(d) list of impaired waters for violations of water quality standards. Listed water bodies, causes of impairment, and source categories or subcategories are shown in Table X-1. Because of the size of the watershed, patchy spatial distribution of impairments, and attending complexity of water quality issues, impairments, potential sources, and load reductions will be discussed broadly by pollutant type. See Section 3.6 for additional information on regional surface water quality, beneficial uses, and impairments. A broader discussion of watershed goals is in Chapter 5.

Table X-1: Central Orange County 303(d) listed water bodies, with impairments and potential sources.

303 (d) Listed Water Body	2010 Impairments	Sources
Balboa Beach	DDT	Historical crop production
	Diieldrin	Historical crop production
	PCBs (Polychlorinated biphenyls)	Urban runoff, hazardous wastes
Borrego Creek (Irvine Blvd to San Diego Creek Reach 2)	Ammonia (unionized)	Historical and current crop production
	Indicator Bacteria	Natural sources (wildlife & vegetation), urban runoff
Buck Gully	Fecal Coliform	Natural sources (wildlife & vegetation), urban runoff
	Total Coliform	Natural sources (wildlife & vegetation), urban runoff
Los Trancos Creek (Crystal Cove Creek)	Fecal Coliform	Natural sources (wildlife & vegetation), urban runoff
	Total Coliform	Natural sources (wildlife & vegetation), urban runoff
Morning Canyon Creek	Indicator Bacteria	Natural sources (wildlife & vegetation), urban runoff
Newport Bay, Lower	Chlordane	Historical crop production
	Copper	Atmospheric deposition, architecture, brake pad dust, marinas
	DDT	Historical crop production
	Nutrients	Historical and current crop production, drainage of wetlands, groundwater
	Indicator Bacteria	Natural sources (wildlife & vegetation), urban runoff
	PCBs (Polychlorinated biphenyls)	Urban runoff, hazardous wastes
	Pesticides	Historical crop production

303 (d) Listed Water Body	2010 Impairments	Sources
	Sediment Toxicity	Unknown
Newport Bay, Upper (Ecological Reserve)	Chlordane	Historical crop production
	Copper	Atmospheric deposition, architecture, brake pad dust, marinas
	DDT	Historical crop production
	Metals	Atmospheric deposition, architecture, brake pad dust, marinas
	Nutrients	Historical and current crop production, drainage of wetlands, groundwater
	Indicator Bacteria	Natural sources (wildlife & vegetation), urban runoff
	PCBs (Polychlorinated biphenyls)	Urban runoff, hazardous wastes
	Pesticides	Historical crop production
	Sediment Toxicity	Unknown
	Sedimentation/Siltation	Crop production, channelization, streambank modification, development
Peters Canyon Channel	DDT	Historical crop production
	Toxaphene	Historical crop production
	Indicator Bacteria	Natural sources (wildlife & vegetation), urban runoff
	pH	Natural geology, historical and current crop production
Rhine Channel	Copper	Atmospheric deposition, architecture, brake pad dust, marinas
	Lead	Urban runoff, hazardous wastes, natural geology
	Mercury	Urban runoff, hazardous wastes, natural geology
	PCBs (Polychlorinated biphenyls)	Urban runoff, hazardous wastes, natural geology
	Sediment Toxicity	Unknown
	Zinc	Atmospheric deposition, urban runoff
San Diego Creek Reach 1	Fecal Coliform	Natural sources (wildlife & vegetation), urban runoff
	Nutrients	Historical and current crop production, drainage of wetlands, groundwater
	Pesticides	Historical crop production
	Sedimentation/Siltation	Crop production, channelization, streambank modification, development
	Selenium	Historical crop production, groundwater, natural geology
	Toxaphene	Historical crop production
San Diego Creek Reach 2	Nutrients	Historical and current crop production, drainage of wetlands, groundwater
	Sedimentation/Siltation	Crop production, channelization, streambank modification, development

303 (d) Listed Water Body	2010 Impairments	Sources
	Unknown Toxicity	Unknown
	Indicator Bacteria	Natural sources (wildlife & vegetation), urban runoff
Seal Beach	Enterococcus	Natural sources (wildlife & vegetation), urban runoff
	PCBs (Polychlorinated biphenyls)	Urban runoff
Serrano Creek	Ammonia (unionized)	Historical and current crop production
	Indicator Bacteria	Natural sources (wildlife & vegetation), urban runoff
	pH	Natural geology, historical and current crop production
Silverado Creek	Pathogens	Natural sources (wildlife & vegetation), urban runoff
	Salinity/TDS/Chlorides	Natural sources, including groundwater

Indicator Bacteria (Including Total and Fecal Coliforms, Pathogens, and Enterococcus)

Indicator bacteria are broad classes of bacteria that are intended to indicate the possible presence of bacteria that are pathogenic to humans. Indicator bacteria can come from a wide array of sources. Controllable sources include septic systems and pet waste. However, much of the observed bacteria may come from natural, largely uncontrollable sources, including wildlife and stream or riparian vegetation, as well as regrowth of bacteria in water bodies.

Newport Bay was 303(d) listed for exceedances of REC-1 water quality objectives, resulting in adoption of the Newport Bay Fecal Coliform Total Maximum Daily Load (FC TMDL) in April 1999. Most sampling sites in Newport Bay attained water quality objectives in at least 75% of samples for the last decade of data collection, particularly in Lower Newport Bay (County of Orange 2012a). In 2011-2012, the highest annual geometric mean concentration of fecal coliforms at any site in Upper Newport Bay was only 44 CFU/100 mL, though the highest single concentration was 6,800 CFU/100 mL, as compared to the fecal coliform single sample maximum of 400 CFU/100 mL. Additional information on bacterial water quality in the watershed can be found on page 3-49 and in the series of FC TMDL annual reports (e.g. County of Orange 2012a).

The FC TMDL required analysis of collected data to inform possible TMDL revisions. A report recommending TMDL revisions is being finalized and should be submitted to the Regional Board by the end of 2012. Among the recommendations are a change from a fecal coliform standard to an *Enterococcus* standard, which is believed to track more closely with human illness, and additional studies to evaluate uncontrollable natural sources which can be used to help determine new water quality objectives.

San Diego Creek Reach 1 was listed for exceedances of REC-1 water quality objectives, although REC-1 full body contact recreation is prohibited in San Diego Creek by the County of Orange. The 2011-2012 annual geometric mean concentration of fecal coliforms in San Diego Creek Reach 1 was 141 CFU/100 mL. However, about half of samples from San Diego Creek exceeded the single sample maximum of 400 CFU/100 mL, with the highest concentration being 54,000 CFU/100 mL. An effort is underway to revise basin plan recreational water quality objectives through the Stormwater Standards Task Force, comprised of local public agencies, the Regional Board, and EPA. One of the expected

recommendations will be to base standards on *Escherichia coli* instead of fecal coliform, which will require development of new water quality objectives.

REC-1 and REC-2 uses apply intermittently to upstream tributaries (SARWQCB 2008). Thus, fecal coliform objectives also currently apply to these tributaries. Streams listed for indicator bacteria or pathogens are tributaries Borrego Creek, Peters Canyon Wash, San Diego Creek Reach 2, Santa Ana-Delhi Channel, and Serrano Creek, as well as three small coastal streams, Buck Gully Creek, Los Trancos Creek, and Morning Canyon Creek. Current bacterial data are limited for these streams, but all of these listings will also likely be affected by efforts of the Stormwater Standards Task Force mentioned above.

Sediment

Excess sedimentation and siltation was one of the earliest water quality impairments recognized in the Newport Bay watershed. Upper Newport Bay and San Diego Creek Reaches 1 and 2 are listed for sediment exceedances. These listings resulted in adoption of the Newport Bay Sediment TMDL (SARWQCB 1999). Sediment sources included agriculture, construction zones, and in-channel scour during storm events. The TMDL required annual average sediment loads to be reduced from 250,000 tons to 125,000 tons, as well as certain minimum capacity requirements in in-channel and in-bay sediment basins. Although the annual sediment load during the 2010-2011 monitoring year was 138,966 tons, the average annual load from 2001-2011 was only 51,056 tons, far below the TMDL target. TMDL monitoring is on-going, but additional control measures are not expected to be implemented at present. Additional information regarding sediment impairment in the Newport Bay watershed can be found on page 3-51 and in the series of Sediment TMDL annual reports (e.g. County of Orange 2012b).

Nutrients

In the context of water quality, nutrients primarily refer to nitrogen and phosphorus and their various chemical forms. While both are essential for healthy ecological functions, excess nutrients can result in eutrophication, a condition in which excessive plant growth impairs ecological health. In Newport Bay, this was observed as excessive algal growth, which in turn resulted in periodically low dissolved oxygen. Watershed nutrient sources included crop production including nurseries, urban runoff from residential and commercial landscaping, and several natural, largely uncontrollable sources such as surfacing groundwater and waste from wildlife and riparian vegetation.

Nutrient water quality objective exceedances resulted in adoption of the Nutrient TMDL (SARWQCB 1998). The TMDL required annual nutrient loads to be reduced by 50% relative to a 1990-1997 baseline period, resulting in annual targets of 298,225 lbs of nitrogen and 62,080 lbs of phosphorus. In the most recent year with finalized data, the nitrogen load was 113,939 lbs, while the average annual load for the previous 5 years was 136,798 lbs, both below the target for nitrogen. The phosphorus load was 65,971 lbs, which was slightly above the target, while the average annual load in the previous 5 years was 40,106 lbs. In the last five years, the nitrogen target has never been exceeded and the phosphorus target was exceeded once.

While the watershed is generally in compliance with TMDL requirements, TMDL monitoring and efforts to improve water quality are on-going. County staff continues public outreach efforts, including working with local schools to deliver lessons on water quality protection and to provide field experiences, and working with agricultural interests to implement appropriate BMPs. Development in the watershed continues, which will reduce agricultural runoff. There are no longer any nurseries in the watershed. At present, agriculture represents less than 1% of the watershed.

Additional information on nutrient related water quality can be found on page 3-55 and in the series of Nutrient TMDL data reports (e.g. County of Orange 2012c).

Selenium

As a water quality issue in the watershed, selenium is linked to nitrogen. Only San Diego Creek Reach 1 is listed for selenium. The area around San Diego Creek historically was a swamp that collected regional stream flows over millennia, and the nitrogen and selenium they contained. This was exacerbated by drainage of the swamp and conversion to agriculture. Channelization of San Diego Creek and establishment of a permanent stream gave rise to both excessive nitrogen and selenium in the creek, leaching both from the soils in which they had been sequestered. While nitrogen loads have been largely controlled in the last decade, selenium has not.

Dry weather selenium concentrations in San Diego Creek Reach 1 average 17 ppb, ranging from 15-22 ppb. The chronic criterion in the California Toxics Rule (CTR) is 5 ppb (EPA 2000). Therefore, concentrations would need to be reduced by nearly 70% to meet current standards.

A comprehensive effort has been underway since 2005 to study the selenium issue. The Nitrogen and Selenium Management Program (NSMP) has been, among other things, evaluating selenium toxicity, identifying watershed sources, studying its dynamic movement through the watershed, and studying and identifying potential BMPs for implementation. NSMP has also evaluated the CTR objective and has proposed development of a site-specific selenium objective for San Diego Creek. This effort requires additional sampling of bird and fish tissues in the watershed to help determine selenium toxicity, from which an objective can be calculated. Depending upon the outcome of these efforts, required load reductions could change.

For additional information on selenium issues in the watershed, see page 3-60 and <http://www.ocnsmp.com>.

Pesticides (including DDT, toxaphene, chlordane, and dieldrin) & PCBs

Though some pesticide listings in the COCWMA are unspecified, identified listings are primarily for organochlorines. These include DDTs, chlordane, and PCBs in Newport Bay, toxaphene in San Diego Creek Reach 1, DDTs and toxaphene in Peters Canyon Wash, PCBs in Rhine Channel and Balboa Beach, and dieldrin on Balboa Beach. These were primarily the result of historical data showing elevated concentrations of these compounds in routine water quality monitoring, resulting in development of the San Diego Creek/Newport Bay Organochlorine Compounds TMDLs, which were recently adopted by the State Water Resources Control Board (SARWQCB 2007).

None of these compounds is in current use. Historically, organochlorine pesticides were favored in crop production due to their resistance to degradation. However, because of their persistence and the harm they caused over long periods to the environment, uses were cancelled for DDT in 1972, toxaphene in 1982, dieldrin in 1987, and chlordane in 1988. The manufacture of PCBs was banned in 1977. Although aquatic concentrations of these chemicals have declined over time, small amounts are still detectable at times (e.g. Goong 2008). The decline of agricultural land uses in the watershed has also helped reduce the prevalence of organochlorines in water samples.

During the course of TMDL development, numerous technical issues were raised regarding the scientific basis for the TMDLs, including evidence for toxicity of these chemicals and the age of scientific reports used to derive some targets. In addition, TMDL targets were set very low. For example, annual targets for DDT and toxaphene in San Diego Creek are 396 g and 6 g, respectively. From 2006-2008, three

relatively large storms were monitored for organochlorines. The average DDT load per storm was 287 g, while the average chlordane load was 24 g. The largest single storm load for DDT was 476 g, while the largest single storm load of chlordane was 31 g. From these data, even a single storm in any given year could be sufficient to exceed TMDL targets. Finally, the State's new Sediment Quality Objectives, evaluating both direct effects to the benthic community and indirect effects transmitted through the food web, will affect the manner in which sediments and sediment-bound pollutants, such as organochlorines, will be evaluated.

For these and other reasons, TMDL implementation will include a work plan to guide additional studies to examine organochlorine toxicity and determine if TMDL targets require revision. Therefore, it is not possible at present to determine required load reductions. However, these compounds continue to degrade in the environment, albeit slowly, and as noted above, continued watershed development will decrease the already small presence of agricultural land uses and, therefore, organochlorine sources. The natural attenuation of these compounds could render them undetectable in future monitoring efforts.

For additional information on toxic pollutants in the watershed, see page 3-57.

Copper & Other Metals

A copper listing is in effect for Upper and Lower Newport Bay, with a separate metals listing for Upper Bay only, and copper, lead, mercury, and zinc listings specifically for Rhine Channel, a closed-ended reach of Lower Newport Bay. Rhine Channel listings will be discussed separately below.

In the 2010-2011 monitoring year, 4 of 20 water samples from Lower Bay and 11 of 40 from Upper Bay exceeded the CTR saltwater acute criterion for dissolved copper of 4.8 µg/L (County of Orange 2011). Exceedances had a mean concentration of 6.4 µg/L, while the mean of all samples was 4.1 µg/L.

While sources of copper and metals in Newport Bay have not been comprehensively studied, potential sources include architectural copper, atmospheric deposition, anti-fouling agents in marine paints, and pesticide/herbicide use (EPA 2002). Marine paints in particular may be a primary copper source and efforts are underway to examine this link (e.g. Schiff et al. 2006; OCC 2007).

Rhine Channel was historically home to a number of heavy industries which may have contributed to observed loads, including canneries, metal plating, and boatyards (Anchor 2005). These industries are thought to have contributed significant loads of metals which contaminated sediments, which in turn continue to be a source of dissolved metals to the water column. Dredging of the Rhine Channel was completed in 2011, and ongoing monitoring will track post-dredging water quality.

THE INFORMATION BELOW COVERS ELEMENT C

Estimate the amounts of technical and financial assistance needed associated costs, and/or the sources and authorities that will be relied upon to implement this plan.

Newport Bay TMDL Funding Partners, which include all watershed cities and Irvine Ranch Water District, Irvine Company, and Lennar, collaboratively develop annual TMDL budgets and 5-yr forecasts for Newport Bay TMDL Programs (excluding Sediment TMDL) and Newport Bay Sediment TMDL Program, as shown below:

Fiscal Year	2012-13	2013-14	2014-15	2015-16	2016-17	Grand Total
All TMDLs (excluding Sediment TMDL)	\$1,423,726	\$1,949,426	\$1,869,426	\$1,215,621	\$1,215,621	\$7,673,820
Sediment TMDL	\$648,000	\$618,100	\$1,111,344	\$1,191,304	\$1,111,191	\$4,679,939
Subtotal	\$2,071,726	\$2,567,526	\$2,980,770	\$2,406,925	\$2,326,812	\$12,353,759

At the end of each fish year, the budgets for the TMDL programs are approved to fund the implementation activities. For each funding partner, its shared cost will be the total annual budget multiplied by its percentage of funding share as stipulated in the cooperative agreement (approved separately; currently the agreement in effect is D11-066). At the same time, new 5-year budget forecast is shared on a rolling basis each year. The budget forecast is nonbinding and aims to facilitate each funding partner to plan future implementation activities and estimate future expenditures.

In addition to the above budgeting and near-term and forecasting effort, County is developing a strategy to ensure a long-term, sustainable source of funding for water quality improvement and regulatory compliance for the County and cities, including Central IRWMP area. The proposed tasks include the following:

1. Develop an estimate of funding needs over the next 20 years to ensure regulatory compliance and achieve water quality improvements. The estimate will be to a “concept” level of accuracy which is more accurate than “order-of-magnitude” but not as precise as a preliminary engineering estimate.
2. Identification of viable long-term funding options
 - a. Review the Long Term Financing Study for the Orange County Stormwater Program and subsequent updates;
 - b. Review other data sources including new applicable legislation, other recent successful or viable stormwater funding programs implemented by other agencies, and other financing options for areas similar to Orange County.
 - c. Recommend two or three viable financing options appropriate for the County
3. Funding Options Implementation Planning
 - a. Develop a detailed list of implementation tasks and activities including policy / legal analysis and public outreach, along with key milestones and associated costs for each approved option
 - b. Provide a quantitative analysis for what type of fee would be required to implement each option
 - c. Provide recommendations for how collected fees/taxes would be allocated to local agencies.

THE INFORMATION BELOW COVERS ELEMENT D

An information and education component used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the nonpoint source management measures that will be implemented.

Section 11 of the Central IRWMP and Section 5 describe in detail the stakeholder process involved in developing the goals and strategies as well as the public outreach work done. Engaging the public and stakeholders is key to a successful watershed management plan. In the Central WMA a formal organizational structure for stakeholder involvement has been in place for over a decade with active participation on regional watershed programs. This comprehensive effort involves local and regional public agencies, environmental organizations, academic institutions, members of the public, and state and federal agencies. Strong collaborative stakeholder relationships enhance the level of involvement and public understanding.

THE INFORMATION BELOW COVERS ELEMENT I

A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item h immediately above.

A variety of monitoring components are used in the Central OC WMA to evaluate the effectiveness of implementation efforts in these watersheds. The table below describes the monitoring component:

Mass emissions monitoring:	Using measurements of a range of urban contaminants, loads, as well as exceedances of relevant water quality criteria, evaluate trends over time.
Estuary / wetlands monitoring:	Using measurements of key pollutants, loads, and biological community parameters, describe impacts on estuarine and wetlands ecosystems and the relationship of any impacts to runoff, based on theoretical and empirical expectations about the structure and function of healthy communities.
Bacteriological / pathogen monitoring:	Using measurements of a suite of bacterial indicators, identify spatial and temporal patterns of elevated level in order to prioritize problem areas.
Bioassessment:	Using multiple lines of evidence (bioassessment, physical habitat, chemistry, toxicity), describe impacts on stream communities and the relationship of any impacts to runoff, based on comparisons with reference locations and a regional Index of Biotic Integrity (IBI) on a year-to-year timeframe.
Dry Weather Reconnaissance:	Using measurements of key pollutants identify potential illegal discharges and illicit connections, based on comparison with historical data and available estimates of background levels.
Land use correlations:	Using an experimental, “before-after,” design, identify changes in runoff associated with the urbanization of previously agricultural land.
TMDL/303(d) listed water body monitoring – nutrient TMDL	Using measurements of nutrients, track progress of nutrient control measures over time, based on comparison with TMDL targets.
TMDL/303(d) listed water body monitoring - toxics TMDL	Using measurements of key pollutants identify potential sources and pathways of toxic compounds and track progress of control measures over time, based on comparison with TMDL targets.

ELEMENT E *Schedule for implementing the nonpoint source management measures identified in this plan that is reasonably expeditious.*

A schedule will be developed for each project as it is implemented.