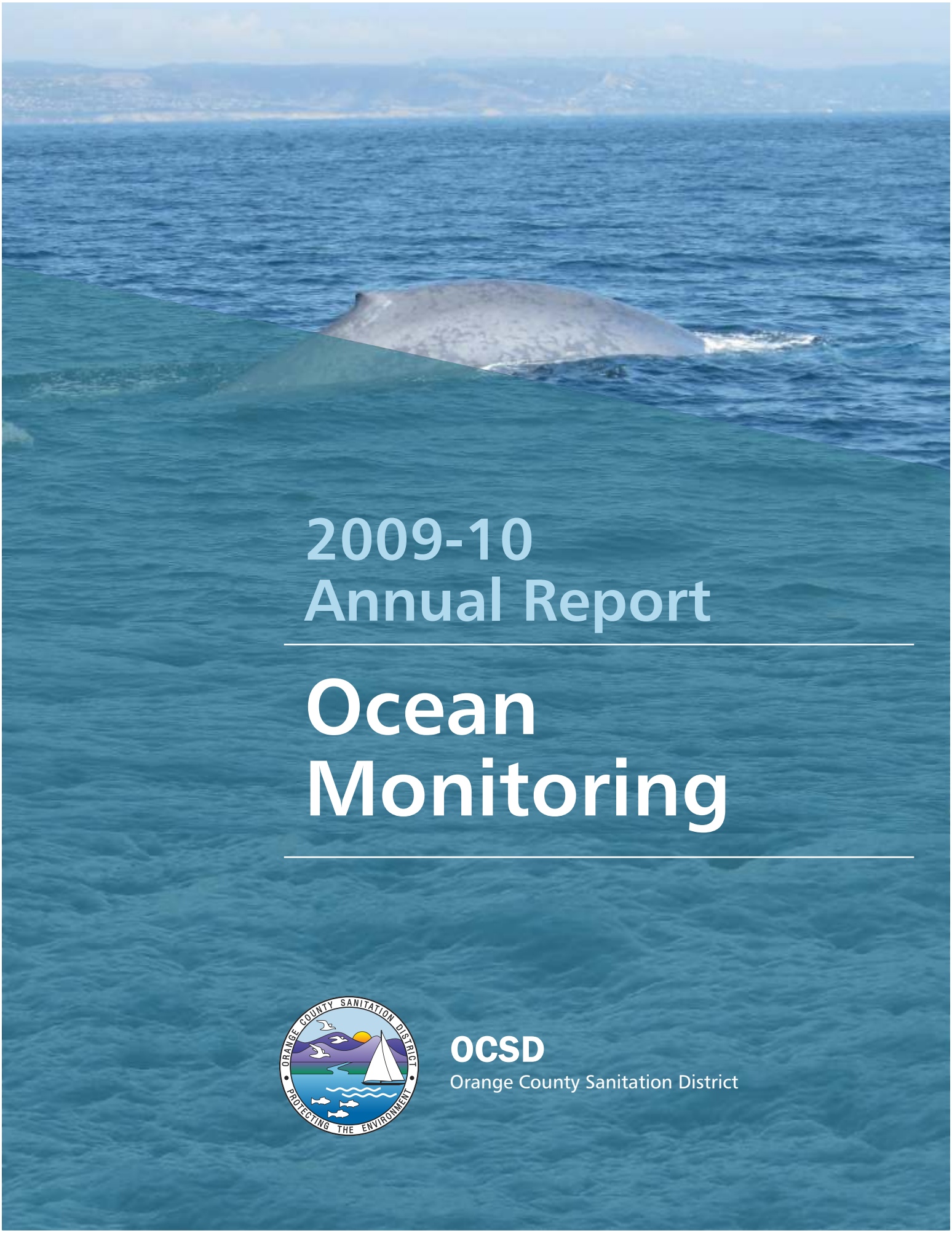

2009-10 Annual Report

Ocean Monitoring

OCSD
Orange County Sanitation District

ORANGE COUNTY SANITATION DISTRICT

We protect public health and the environment by providing effective wastewater collection, treatment, and recycling.

February 28, 2011

Kurt V. Berchtold, Executive Officer
California Regional Water Quality Control Board
Santa Ana Region 8
3737 Main Street, Suite 500
Riverside, CA 92501-3339

SUBJECT: Board Order No. R8-2004-0062, NPDES Permit No. CA0110604
2009-10 Marine Monitoring Annual Report

Enclosed is the Orange County Sanitation District's 2009-10 Marine Monitoring Report. This report focuses on the findings and conclusions for the period July 1, 2009 to June 30, 2010. Overall, the conclusions are consistent with prior reports that document that the disposal of our treated and disinfected effluent into coastal marine waters continues to protect the environment and human health. What is different from previous years is the decline in several measures of the infauna biologic community in and adjacent to the zone of initial dilution (ZID).

The results of the 2009-10 monitoring effort showed minor to moderate impacts measured in the benthic infauna community near the outfall this year, such as increased abundances of opportunistic pollution tolerant species. However, no station outside the ZID was classified as degraded and diverse biological communities persist in the monitoring area beyond the ZID. There were limited and minimal changes in the receiving water or sediment conditions. Plume-related changes in temperature, salinity, dissolved oxygen, pH, and transmissivity beyond the ZID were well within the range of natural variability, and compliance with numeric receiving water criteria was achieved over 95% of the time. Sediment contaminants remained at or near background levels. The low levels of contaminants in fish tissues and the low incidents of external abnormalities and diseases in fish populations demonstrated that the outfall was not an epicenter of disease. Consequently, our ocean monitoring program continues to demonstrate that the coastal receiving water environment outside the ZID has not been degraded by the District's wastewater discharge. Finally, the low concentrations of bacteria in water contact zones, together with the limited distributions of ammonia, suggest that the wastewater discharge has had no discernable impact on the human health and recreational use.

As requested at our recent Quarterly Regulatory meeting (January 10, 2011), we will schedule a meeting with RWQCB and USEPA staff to discuss these results and future studies to investigate the potential extent and cause(s) of the observed changes on the benthic community. Should you have questions regarding the information provided in this report, or wish to meet with District's staff to discuss any aspect of our ocean monitoring program, please feel free to contact me at (714) 593-7080. However, you may also contact Dean Pasko, the supervisor of our ocean monitoring program, who may be reached at (714) 593-7535 or at dpasko@ocsd.com.

Edward M. Torres, P.E.
Director of Operations and Maintenance

ET:GLR:plj
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Enclosure

c: Wayne Nastri, U.S. EPA, Region IX

ORANGE COUNTY SANITATION DISTRICT

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February 28, 2011

Certification Statement

The following certification satisfies Section A.10 and A.15 of the Orange County Sanitation District's Monitoring and Reporting Program No. R8-2004-0062, NPDES No. CA0110604, for the submittal of the attached OCSD Annual Report 2010 – Marine Monitoring.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for known violations.

Edward M. Torres, P.E.
Director of Operations and Maintenance

2-24-11
Date

GLR:plj
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ANNUAL REPORT 2010

MARINE MONITORING

Orange County Sanitation District
10844 Ellis Avenue
Fountain Valley, CA 92728-8127
(714) 962-2411

CONTENTS

page

page

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page

Chapter 1 - THE OCEAN MONITORING PROGRAM

No Tables.

Chapter 2 - COMPLIANCE DETERMINATIONS

Chapter 3 - COASTAL OCEANOGRAPHY AND WATER QUALITY

Chapter 4 - SEDIMENT GEOCHEMISTRY

Chapter 5 - MACROBENTHIC INVERTEBRATE COMMUNITIES

page

Chapter 6 - TRAWL COMMUNITIES AND ORGANISM HEALTH

Appendix A – DETAILED METHODS

page

Appendix B - SUPPORTING DATA

Appendix C - QUALITY ASSURANCE/ QUALITY CONTROL

page

page

Chapter 1 - THE OCEAN MONITORING PROGRAM

Chapter 2 - COMPLIANCE DETERMINATIONS

Chapter 3 - COASTAL OCEANOGRAPHY AND WATER QUALITY

page

Chapter 4 - SEDIMENT GEOCHEMISTRY

Chapter 5 - MACROBENTHIC INVERTEBRATE COMMUNITIES

Chapter 6 - TRAWL COMMUNITIES AND ORGANISM HEALTH

page

Appendix A – DETAILED METHODS

Appendix B - SUPPORTING DATA

page

Appendix C - QUALITY ASSURANCE/ QUALITY CONTROL

The following is a list of abbreviations and acronyms used in the Marine Monitoring Volume. A table of metric equivalents is included to allow conversions from metric to U.S. units.

acidity/alkalinity	pH
acoustic Doppler current profiler	ADCP
aluminum	Al
ammonium	NH_4^+
analysis of variance	ANOVA
antimony	Sb
arsenic	As
accelerated solvent extractor	ASE
balanced indigenous population	BIP
base/neutral/acid	BNA
Benthic Response Index	BRI
beryllium	Be
biochemical oxygen demand	BOD
cadmium	Cd
California Department of Health Services	CDHS
catch per unit effort	CPUE
centimeter	cm
chlorophyll-*a*	Chl-*a*
chromium	Cr
Clean Water Act	CWA
conductivity/temperature/depth	CTD
copper	Cu
cubic centimeter	cm^3
cubic meter	m^3
degree Celsius	^oC
differential Global Positioning System	dGPS
dissolved oxygen	DO
dry weight	dry wt
effects range low	ERL
effects range medium	ERM
Environmental Laboratory and Ocean Monitoring	ELOM
Environmental Protection Agency	EPA
Environmental Sciences Laboratory	ESL
epibenthic macroinvertebrates	EMI
Effects Range-Low	ER-L
Effects Range-Medium	ER-M
flow injection mercury system	FIMS
foot	ft
Food and Drug Administration	FDA
gallon	gal
gallons per day	gpd
gas chromatograph with dual electron capture detector	GC/ECD/ECD
gas chromatograph with tandem mass spectrometer	GC/MS/MS
gas chromatography/mass spectrometry	GC/MS
Global Positioning System	GPS
gram	g
greater than	>
greater than or equal to	$\geq$
high-density polyethylene	HDPE
inductively coupled emission spectroscopy	ICPES
inductively coupled mass spectroscopy	ICPMS
inch	in

Infaunal Trophic Index	ITI
iron	Fe
Joint Water Pollution Control Plant	JWPCP
kilogram	kg
kilometer	km
lead	Pb
less than	<
less than or equal to	≤
linear alkyl benzenes	LAB
liter	L
liters/day	L/day
magnesium sulfate	$MgSO_4$
Margalef Species Richness	SR
mass emission rate	MER
mean	$\bar{x}$
mercury	Hg
meter	m
method detection limit	MDL
metric tons per day	MT/day
metric tons per year	MT/yr
microgram	µg
micrograms per gram	µg/g
micrograms per kilogram	µg/kg
micrograms per liter	µg/L
mile	mi
milligram	mg
milligrams per kilogram	mg/kg
milligrams per liter	mg/L
milliliter	mL
millimeter	mm
million gallons per day	MGD
most probable number	MPN
nanogram	ng
nanograms per gram	ng/g
National Marine Fisheries Service	NMFS
National Oceanic and Atmospheric Administration	NOAA
National Pollutant Discharge Elimination System	NPDES
National Research Council	NRC
National Status and Trends	NS&T
nautical mile	nmi
nickel	Ni
not analyzed	NA
not applicable	N/A
not detected	ND
not significant	ns
oil and grease	O&G
Orange County Sanitation District	District or OCSD
Orange County Health Care Agency	OCHCA
Orange County Water District	OCWD
out-of-range occurrence	ORO
parts per billion	ppb
parts per million	ppm
parts per thousand	ppt
percent	%
plus or minus	±

polychlorinated biphenyls	PCB
polycyclic aromatic hydrocarbons	PAH
pound	lb
practical salinity unit	psu
probability	p
publicly owned treatment works	POTW
quality assurance	QA
quality control	QC
Quality Assurance Project Plan	QAPP
quality assurance/quality control	QA/QC
Regional Water Quality Control Board	RWQCB
repeated measures analysis of variance	RMANOVA
relative percent difference	RPD
remaining particulates	RP
Science Applications International Corporation	SAIC
Scripps Institution of Oceanography	SIO
second	sec or s
sediment quality triad	SQT
selenium	Se
Shannon-Wiener diversity index	H'
silver	Ag
Southern California Association of Marine Invertebrate Taxonomists	SCAMIT
Southern California Bight	SCB
Southern California Bight Pilot Project	SCBPP
Southern California Coastal Water Research Project	SCCWRP
Southern California Marine Institute	SCMI
species (singular)	sp
species (plural)	spp
Species Evenness	J’
square centimeter	cm^2
square kilometer	km^2
square meter	m^2
standard operating procedure	SOP
standard reference material	SRM
Statistical Analysis System	SAS
Strategic Process Study	SPS
Student-Newman-Keuls	SNK
thallium	Tl
tons per year	tons/yr
total DDT	tDDT
total organic carbon	TOC
total polycyclic aromatic hydrocarbons	tPAH
total polychlorinated biphenyls	tPCB
total suspended solids	TSS
total volatile solids	TVS
U.S. Environmental Protection Agency	USEPA
U.S. Fish and Wildlife Service	USFWS
weight	wt
wet weight	wet wt
year	yr
zinc	Zn
zone of initial dilution	ZID

Metric System With U.S. Equivalents	
Metric Unit	**U.S. Equivalent**
Length	
millimeter (mm)	0.04 inches
centimeter (cm)	0.39 inches
meter (m)	39.37 inches/3.28 ft
kilometer (km)	0.62 miles, 0.54 nm
nautical mile (nm)	1.151 miles
Area	
square centimeter (cm^2)	0.155 sq. inches
square meter (m^2)	1.196 sq. yards
sq. kilometer (km^2)	0.3861 sq. miles
Weight	
milligram (mg)	0.015 grains
gram (g)	0.035 ounces
kilogram (kg)	2.2046 pounds
metric ton (MT)	1.1 tons
Volume	
cubic centimeter (cm^3)	0.061 cubic inches
cubic meter (m^3)	1.31 cubic yards
liter (L)	0.2642 gallons
Capacity, Cubic	
milliliter (mL)	0.06 cubic inches
liter (L)	61.02 cubic inches
kiloliter (kL)	1.31 cubic yards
Temperature	
°C (Centigrade)	(9/5)(^{0}C) + 32 = ^{0}F (Farenheit)
Speed	
meters per second (m/s)	2.237 miles per hour (mph)
nautical mile per hour (knot)	1.151 miles per hour (mph)

ACKNOWLEDGEMENTS

The following individuals are acknowledged for their contributions to the Marine Monitoring Volume of the 2009-10 Annual Report:

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Dean Pasko	Ocean Monitoring Program Supervisor

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Miriam Angold, Jeff Armstrong, Jim Campbell, Kim Christensen, Arturo Diaz, Joel Finch, Linda Kirchner, Laura Terriquez, Joe Manzella, Mike McCarthy, Charles McGee, Lori McKinley, Ryan McMullin, Mike Mengel, Donna Min, Dawn Myers, Canh Nguyen, Hai Nguyen, Thomas Nguyen, Dean Pasko, Vanh Phonsiri, Anthony Pimentel, Tony Pira, George Robertson, Ernie Ruckman, Ken Sakamoto, Christina Thomas, Yu-Li Tsai, Amy Valencia, Mike von Winklemann, and Norman Whiteman.

Enchanter, Inc.

Tom Pesich

Weston Solutions Inc.:

Carrie Burleson, Sally Hawkins, Sheila Holt, John Ljubenkov, Yat-Long Poon, Olga Weaver, and Satomi Yonemasu.

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2/11