2006 Annual Reports and Summary South Bay Wastewater Reclamation Plant & South Bay Ocean Outfall

Monitoring and Reporting
Program No. 2000-129
NPDES No. CA 0109045 &
Order No. 2000-203

ISO 14001

THE CITY OF SAN DIEGO

June 29, 2007

Mr. John Robertus, Executive Officer
California Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Attn: POTW Compliance Unit

Dear Mr. Robertus:

Enclosed are the 2006, Annual Reports and Summary, South Bay Water Reclamation Plant and Ocean Outfall as specified in discharge Order No. 2000-129, NPDES Permit No. CA0109045.

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, I certify that 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 fine and imprisonment for knowing violations.

Sincerely,

ALAN C. LANGWORTHY
Deputy Director
Environmental Monitoring & Technical Services Division

SWM

cc: EPA Region 9
San Diego County Department of Environmental Health
Distribution
File

DIVERSITY BRINGS US ALL TOGETHER

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City of San Diego
Metropolitan Wastewater Department
Environmental Monitoring & Technical Services Division

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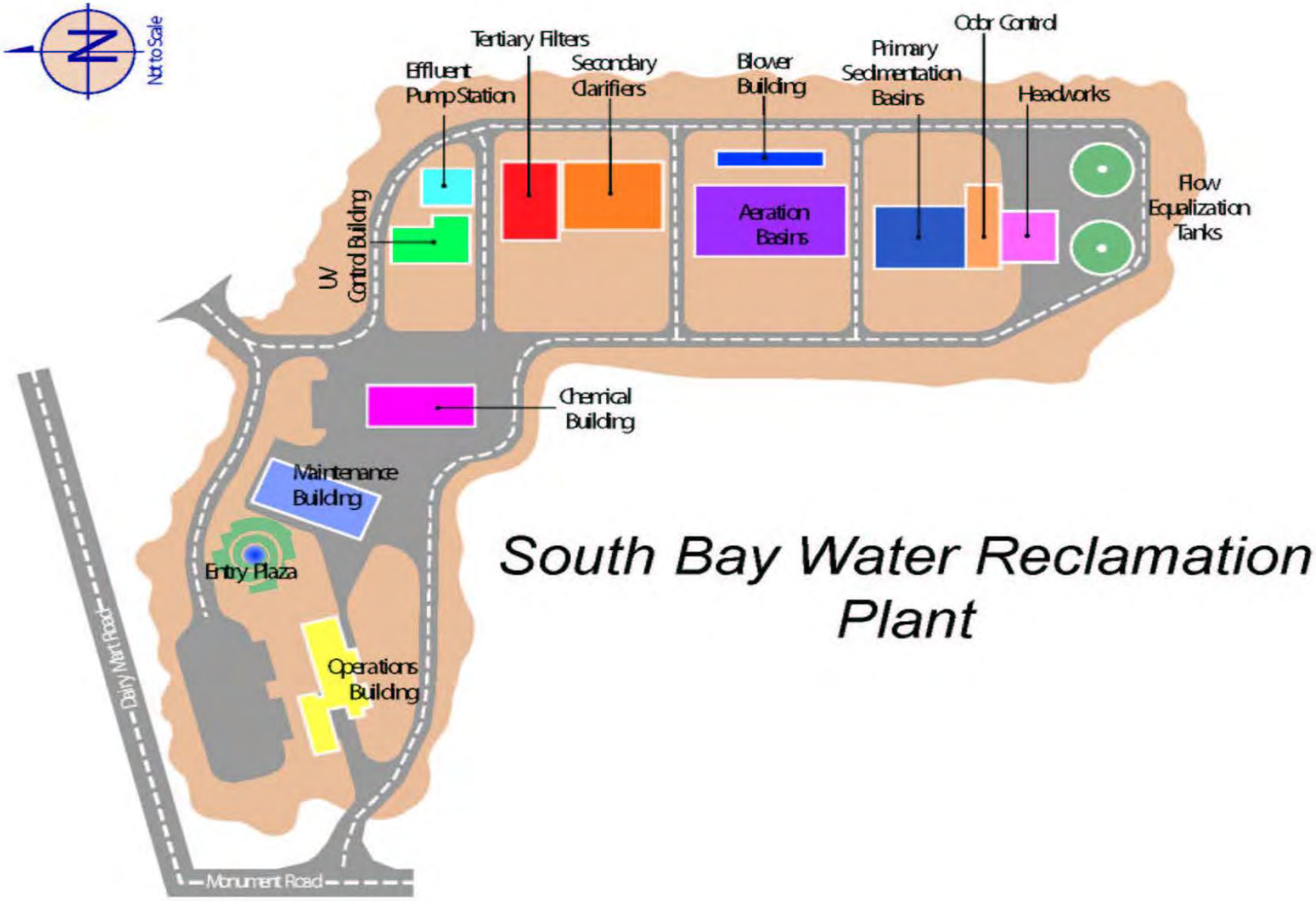
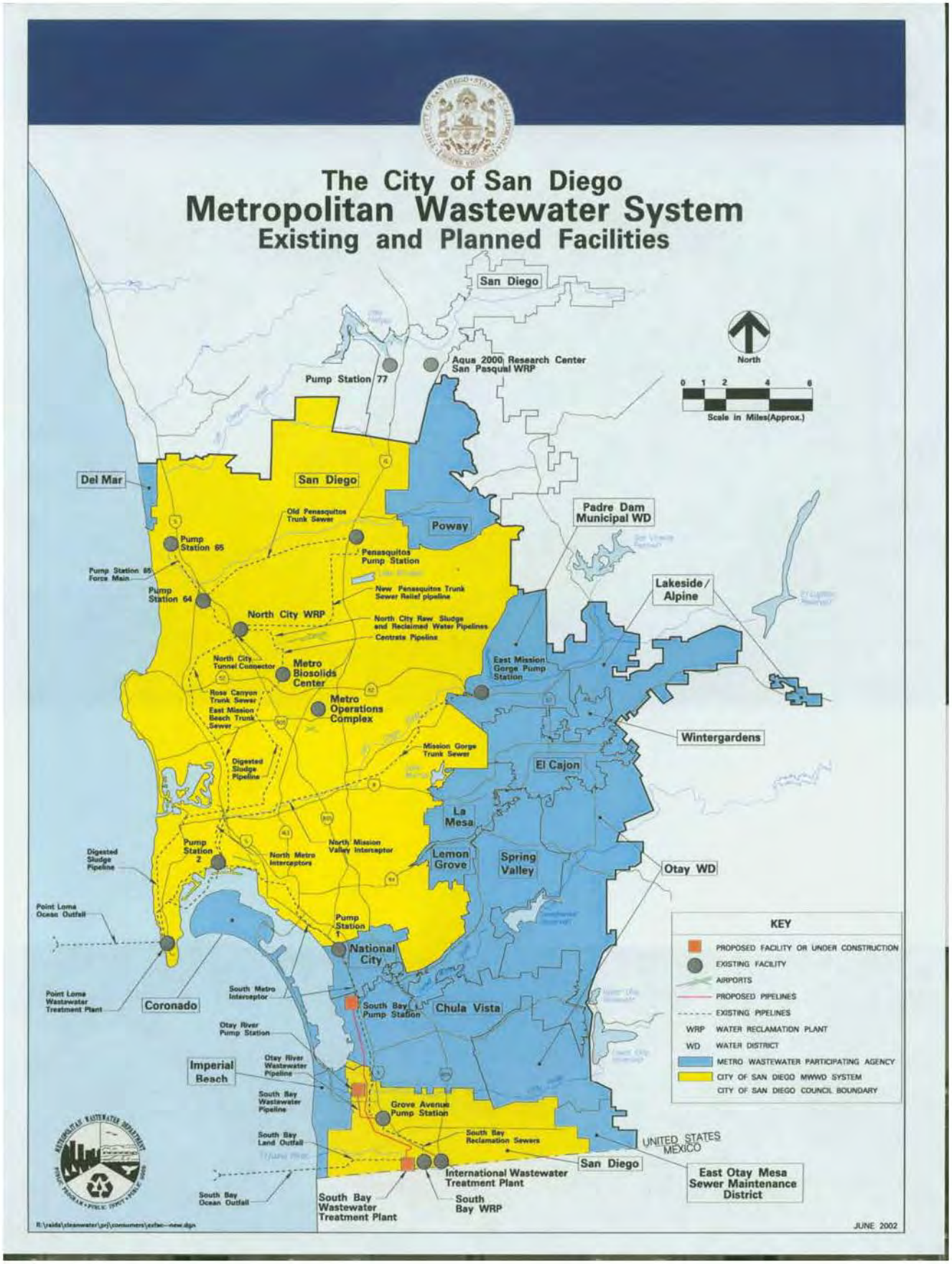

Not to Scale
Tertiary Filters
Effluent Pump Station
Secondary Clarifiers
Blower Building
Odor Control
Primary Sedimentation Basins
Headworks
Flow Equalization Tanks
Aeration Basins
UV Control Building
Chemical Building
Maintenance Building
Entry Plaza
Operations Building
Dairy Mart Road
Monument Road
South Bay Water Reclamation Plant


The City of San Diego
Metropolitan Wastewater System
Existing and Planned Facilities
San Diego
Aqua 2000 Research Center
San Pasqual WRP
Pump Station 77
North
0 1 2 4 6
Scale in Miles(Approx.)
Del Mar
San Diego
Old Penasquitos Trunk Sewer
Poway
Padre Dam Municipal WD
Pump Station 65
Penasquitos Pump Station
Pump Station 65 Force Main
Pump Station 64
New Penasquitos Trunk Sewer Relief pipeline
Lakeside / Alpine
North City WRP
North City Raw Sludge and Reclaimed Water Pipelines
Centrate Pipeline
North City Tunnel Connector
Metro Biosolids Center
East Mission Gorge Pump Station
Rose Canyon Trunk Sewer
East Mission Beach Trunk Sewer
Metro Operations Complex
Wintergardens
Mission Gorge Trunk Sewer
Digested Sludge Pipeline
El Cajon
La Mesa
Pump Station 2
North Mission Valley Interceptor
North Metro Interceptors
Lemon Grove
Spring Valley
Otay WD
Digested Sludge Pipeline
Point Loma Ocean Outfall
Pump Station 1
National City
South Metro Interceptor
Point Loma Wastewater Treatment Plant
Coronado
South Bay Pump Station
Chula Vista
Otay River Pump Station
Imperial Beach
Otay River Wastewater Pipeline
South Bay Wastewater Pipeline
Grove Avenue Pump Station
South Bay Land Outfall
South Bay Reclamation Sewers
UNITED STATES
MEXICO
San Diego
International Wastewater Treatment Plant
East Otay Mesa Sewer Maintenance District
South Bay Ocean Outfall
South Bay Wastewater Treatment Plant
South Bay WRP
KEY
PROPOSED FACILITY OR UNDER CONSTRUCTION
EXISTING FACILITY
AIRPORTS
PROPOSED PIPELINES
EXISTING PIPELINES
WRP WATER RECLAMATION PLANT
WD WATER DISTRICT
METRO WASTEWATER PARTICIPATING AGENCY
CITY OF SAN DIEGO MWWD SYSTEM
CITY OF SAN DIEGO COUNCIL BOUNDARY
JUNE 2002

I. Introduction

A. Explanatory Notes:

The purpose of this document is to meet the requirements of Monitoring and Reporting Program (MRP) No. R-2000-129, NPDES Permit No. CA0109045, as well as the requirements of Order No. 2000-203 for the production and purveyance of recycled water at the South Bay Water Reclamation Plant. This document is also intended to be a reference source for regulatory agencies, City of San Diego staff and their consultants. To this end, the past year's data is presented in tabular and graphical form. Presented in this report are annual monitoring results, as well as special items and discussions itemized in Order No. R-2000-129. We have made this document comprehensive by including useful supporting information on analytical methods, frequency and changes in analyses, long term tables of selected analytes, operational data, background analyses and treatment plant process control. Where the permit sets limits or requests the analysis of various groups of compounds (such as chlorinated and non-chlorinated phenols, PCBs, hexachlorocyclohexanes, etc.) we have provided summaries and averages of these groups and also of the individual compounds.

The Recycled Water Users Summary Report as described in Permit No. 2000-203 is submitted separately from this report.

This is the first year for production and distribution of reclaimed water for this facility. You will find a new section Reclaim Water Data Summary that details the operations and monitoring for the reclaimed water for 2006.

It should be noted that for averaging purposes "less than" and "not detected" (nd) values were treated as zeros. In many parts of the report zero values are found. Our computer system reads "less than" values as zero for summaries, as well as in computing averages. In those areas where zeros are found the reader can find appropriate method detection limits(MDL) in the table of data. Because "less than" values are averaged as zero a number of the summary table values are lower than the detection limits. The data tables may also contain values expressed as a <X (less than) with some number X. For example, the Diazinon value for PLE on March 10, 1998 (in the table below) is reported as <2.4 ug/L (see the below table); this indicates that one or more, of two or more, determinations was above the MDL, while the average was below the MDL. This value is still treated as a zero for averaging and other summary calculations. Note also, that sub-totals and totals consisting of multiple analytes (see below) are also reported as "<X", where the "X" value is the highest MDL for the particular group of analytes. This has the same significance as a "ND" or not detected.

Organophosphorus Pesticides

	MDL	Units	PLE 10-MAR-1998 0311980006	PLE 27-APR-1998 0428980006	PLE 10-SEP-1998 9809107494	PLR 10-MAR-1998 0311980007	PLR 27-APR-1998 0428980007	PLR 10-SEP-1998 9809107515
Demeton O	1.69	UG/L	ND	ND	ND	ND	ND	ND
Demeton S	1.82	UG/L	ND	ND	ND	ND	ND	ND
Diazinon	2.41	UG/L	<2.4	ND	ND	<2.4	ND	ND
Guthion	7.1	UG/L	ND	ND	ND	ND	ND	ND
Malathion	2.98	UG/L	ND	ND	ND	ND	ND	ND
Parathion	2.83	UG/L	ND	ND	ND	ND	ND	ND
Thiophosphorus Pesticides			<7.1	<7.1	<7.1	<7.1	<7.1	<7.1
Demeton -O, -S			<1.8	<0.2	<0.2	<1.8	<0.2	<0.2
Total Organophosphorus Pesticides			<7.1	<7.1	<7.1	<7.1	<7.1	<7.1

A further limitation, that the user of this data should note, is that confidence in the results of an analysis is heavily dependent upon the concentration relative to the Method Detection Limit (MDL). For the most part our detection limits have been established using the procedure in 40 CFR, part 136. This statistical basis for the MDL results in a defined statistical confidence (at the 99% Confidence Interval) of

essentially ±100% of the result at or near the MDL. Only at concentrations approximately 5 times the MDL is the confidence interval at ±20% relative. While the precision of our methods generally ranges from 2-3 significant figures, the above limitations of confidence should always be considered.

Where possible, the influent and effluent values of a given parameter have been included on the same graph to make the removals and other relationships readily apparent. Please note that many of the graphs are on expanded scales that don't go to zero concentrations but show, in magnified scale, that range of concentrations where variation takes place. This makes differences and some trends obvious that might normally not be noticed, however, it also provides the temptation to interpret minor changes or trends as being of more significance than they are. Frequent reference to the scales and the actual differences in concentrations is therefore necessary.

E" Qualifier, estimated concentrations:

Ocean data for chlorinated pesticides and PCB congeners contains data that is qualified with a prefixed **"E"** (see example below). This indicates **Estimated** concentrations. Analytical technique is sufficiently specific and sensitive enough (GC-MS-MS) so that qualitative identification has high confidence while the quantitative data is below 40CFR136 confidence intervals for MDL concentrations. The concentrations reported with this qualifier indicate that one or more tests identified the compound but it was below detection limits for quantitation. When reported as part of annual averages, the "E" qualifier may accompany average concentration values either below or above MDLs.

Analyte	MDL	Units	SD-14 2001 Avg	SD-17 2001 Avg	SD-18 2001 Avg	SD-19 2001 Avg	SD-20 2001 Avg	SD-21 2001 Avg	RF-1 2001 Avg
Hexachlorobenzene	13.3	UG/KG	<13.3	<13.3	<13.3	<13.3	E3.7	<13.3	**E2.8**
BHC, Gamma isomer	100	UG/KG	ND	ND	ND	ND	ND	ND	ND
Heptachlor	20	UG/KG	ND	ND	ND	ND	ND	ND	ND
Aldrin	133	UG/KG	ND	ND	ND	ND	ND	ND	ND
Heptachlor epoxide	20	UG/KG	ND	ND	ND	ND	ND	ND	ND
o,p-DDE	13.3	UG/KG	<13.3	E43.5	<13.3	E107.0	<13.3	<13.3	**E22.0**
Alpha Endosulfan	133	UG/KG	ND	ND	ND	ND	ND	ND	ND
Alpha (cis) Chlordane	13.3	UG/KG	<13.3	<13.3	ND	<13.3	<13.3	ND	<13.3
Trans Nonachlor	20	UG/KG	E11.3	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0
p,p-DDE	13.3	UG/KG	713.0	1460.0	459.0	2030.0	618.0	693.0	712.0
Dieldrin	20	UG/KG	ND	ND	ND	ND	ND	ND	ND
o,p-DDD	13.3	UG/KG	ND	ND	ND	<13.3	<13.3	<13.3	<13.3
Endrin	20	UG/KG	ND	ND	ND	ND	ND	ND	ND
o,p-DDT	13.3	UG/KG	<13.3	ND	ND	<13.3	<13.3	ND	<13.3
p,p-DDD	13.3	UG/KG	E7.5	E5.5	<13.3	<13.3	E7.8	<13.3	E18.2
p,p-DDT	13.3	UG/KG	E5.9	<13.3	<13.3	<13.3	E5.4	<13.3	<13.3
Mirex	13.3	UG/KG	<13.3	ND	ND	ND	ND	ND	ND

nd= not detected
NA= not analyzed
NS= not sampled
E=estimated value, value is less than the Method Detection Limit but confirmed by GC/MS-MS

B. Notes on Specific Analyses:

1. It should be noted that some of the reference methods are equivalent. The organic priority pollutant analyses listed in E.P.A.'s Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846 (ref. c) are equivalent to the methods E.P.A. prescribes for water in Methods for Chemical Analysis for Water and Wastes, (ref.a). Specifically wastewater methods 3510 and 8270 (ref.d) together are the same as the water method 625 (ref.a), and Method 8240 (ref. c) is equivalent to Method 624 (ref.a). Methods 3550 and 8270 together are equivalent to the E.P.A. Contract Laboratory Program's (ref. aa) method for ultrasonication and gas chromatograph-mass spectrographic analysis. The E.P.A.'s metals analyses for water (ref.a) generally just refers to the procedure in Standard Methods (ref. b, bb).

2. Metals (detection limits)

Metals MDLs were updated in December of 2006. The MDLs referenced in this report are the maximum MDL for the calendar year. Following is a table comparing the wastewater detection limits for January through November with those from December.

Sewage
ug/L

	Jan - Nov	Dec -
	MDL	MDL
Al	6.6	47
Sb	1.015	2.9
Ba	0.02015	0.039
Be	0.0395	0.022
B	1.101	1.7
Cd	0.1945	0.53
Cr	0.1885	1.2
Co	0.162	0.85
Cu	0.3925	0.63
Fe	0.785	37
Pb	1.384	2
Mn	0.0494	0.24
Mo	0.122	0.89
Ni	0.2675	0.53
Ag	0.156	0.4
Te	1.806	3.9
V	0.4755	0.64
Zn	0.5435	0.41

C. Terms and Abbreviations used in this Report

Along with standard abbreviations the following is a list of local/uncommon abbreviations and terms for the readers‘ reference.

PLANT TERMS

U.S.EPA - United States Environmental Protection Agency.
NPDES - National Pollutant Discharge Elimination System.
WWTP - Wastewater Treatment Plant.
WRP - Water Reclamation Plant.
PLWWTP - Pt. Loma Wastewater Treatment Plant
PLR - Point Loma Raw (influent to the plant).
PLE - Point Loma Effluent (effluent from the plant).
SBWRP - South Bay Wastewater Reclamation Plant
IWTP - International Wastewater Treatment Plant
SB_OUTFALL_00 - South Bay Ocean Outfall
SB_INF_02 - South Bay Influent; raw sewage influent to plant
SB_ITP_COMB_EFF - Combined effluent from South Bay Wastewater Reclamation Plant and International Wastewater Treatment Plant.
SB_PRI_EFF_10 - South Bay Primary Effluent
SB_SEC_EFF_29 - South Bay Secondary Effluent
SB_RSL_10_1 - South Bay Return Sludge Line (to PLWWTP)

UNITS

mg/L ..... milligrams per liter
ug/L micrograms per liter = 0.001 milligrams per liter
ng/L nanograms per liter = 0.001 micrograms per liter
mg/Kg..... milligrams per kilogram
ug/Kg..... micrograms per kilogram
ng/Kg..... nanograms per kilogram
pg/L ..... picograms per liter
pg/Kg.....picograms per kilogram
pc/L or pCi/L ..... pico curies per liter (a measure of radioactivity)
TU..... toxicity units
ntu..... nephelometric turbidity units
^{o}C .....degrees Celsius = degrees centigrade
MGD..... million gallons per day
umhos/cm. . micromhos per centimeter (conductivity)
uS..... microsiemens = umhos (conductivity)
mils/100 mL..... millions per 100 milliliters
nd..... not detected
NA .....not analyzed (when in a data column)
NR ..... not required
NS.....not sampled

CHEMICAL TERMS & ABBREVIATIONS:

AA .....Atomic Absorption Spectroscopy.
Ag .....Silver
Al .....Aluminum
As.....Arsenic
B .....Boron
Ba.....Barium
Be.....Beryllium
BOD.....Biochemical Oxygen Demand
Br .....Bromide
C .....Carbon
Ca.....Calcium
Cd .....Cadmium
Cl .....Chlorine
CN^-.....Cyanide
Co .....Cobalt
COD.....Chemical Oxygen Demand
Cr .....Chromium
Cr^{6+} .....Hexavalent Chromium
Cu .....Copper
D.O. .....Dissolved Oxygen
DDD .....Dichlorodiphenyldichloroethane
.....(a.k.a. TDE-tetrachlorodiphenylethane)
DDE.....Dichlorodiphenyldichloroethylene
DDT.....Dichlorodiphenyltrichloroethane
F.....Fluorine
Fe .....Iron
$FeCl_3$.....Ferric Chloride
G&O .....Grease and Oil
GC .....Gas chromatography.
GC-ECD .....-Electron Capture Detector.
GC-FID.....-Flame Ionization Detector.
GC-FPD.....-Flame Photometric Detector.
GC-MS .....-Mass Spectroscopy.
H .....Hydrogen
H_2S.....Hydrogen Sulfide
Hg .....Mercury
I.....Iodine
IC .....Ion Chromatography
ICP-AES .....Inductively Coupled Plasma-Atomic Emission Spectroscopy
K .....Potassium
Li .....Lithium
MDL .....Method Detection Limit
Mg .....Magnesium
Mn .....Manganese
Mo .....Molybdenum
MSD .....Mass Spectroscopy Detector
N .....Nitrogen
Na .....Sodium
NH_3.....Ammonia
NH_3-N.....Ammonia Nitrogen
NH_4^+ .....Ammonium ion
Ni.....Nickel
NO_3^- .....Nitrate
O .....Oxygen
PAD .....Pulsed Amperometric Detector
Pb.....Lead
PCB .....Polychlorinated Biphenyls
PO_4^{3-} .....Phosphate
S.....Sulfur
Sb ..... Antimony
Se ..... Selenium
Sn ..... Tin
SO_4^{2-} ..... Sulfate
SS ..... Suspended Solids
TBT ..... Tributyl tin
TCH..... Total Chlorinated Hydrocarbons (i.e. chlorinated pesticides & PCB's)
TCLP..... Toxicity Characteristic Leaching Procedure
TDS ..... Total Dissolved Solids
Tl..... Thallium
TS..... Total Solids
TVS ..... Total Volatile Solids
V..... Vanadium
VSS ..... Volatile Suspended Solids
Zn ..... Zinc

D. Frequency of Analysis and Type of Sample - 2006

1. Definitions.

D= Daily W= Weekly M= Monthly Q= Quarterly S= Semi-Annual

		FREQUENCY OF ANALYSIS			
Constituent	***Type of Sample***	***Influent***	***Effluent***	***Comb_Effluent***	***Reclaim***
REQUIRED TESTING					
Flow	Recorder/Totalizer	*Continuous*	*Continuous*		*Continuous*
Biochemical Oxygen Demand -Total (5-day)	24hr Composite	*D*	*D*	*Q*	*D*
Oil and Grease	Grab		*W*	*Q*	
pH	Grab		*D*	*Q*	*D*
Settleable Solids	Grab		*W*	*Q*	
Temperature			*W*	*Q*	
Total Suspended Solids	24hr Composite	*D*	*D*	*Q*	*D*
Volatile Suspended Solids	24hr Composite				*D*
Total Dissolved Solids	24hr Composite				*M*
Turbidity	24hr Composite		*W*	*Q*	*W*
Dissolved Oxygen	Grab		*W*	*Q*	
Total Residual Chlorine	Grab		*W*	*Q*	
As,Cd,Cr,Cu,Pb,Hg,Ni,Ag,Zn	24hr Composite	*M*	*M*	*Q*	
Sb, Be, Tl	24hr Composite		*M*	*Q*	
Se	24hr Composite		*M*	*Q*	
Fe, Mn, B					*M*
Anions (Chloride, Sulfate, Nitrate as N, Fluoride)	24hr Composite				*M*
Ammonia-Nitrogen	24hr Composite		*M*	*Q*	
MBAS	24hr Composite				*M*
Cyanide	24hr Composite	*M*	*M*	*Q*	
Acrolein and Acrylonitrile	Grab		*Q*	*Q*	
Base/Neutral Compounds	24hr Composite		*Q*	*Q*	
Benzidines	24hr Composite		*Q*	*Q*	
Dioxin	24hr Composite		*M*	*Q*	
Percent Sodium	24hr Composite				*M*
Pesticides, chlorinated	24hr Composite		*M*	*Q*	
Phenols, non-chlorinated	24hr Composite		*M*	*Q*	
Phenols, chlorinated	24hr Composite		*M*	*Q*	
Polychlorinated Biphenyls	24hr Composite		*Q*	*Q*	
Purgeable (Volatile) Compounds	Grab		*Q*	*Q*	
Tri, Di, & monobutyl tins	24hr Composite		*Q*	*Q*	
Radiation	24hr Composite		*M*	*Q*	
Toxicity (Acute & Chronic)*	24hr Composite		*W*	*Q*	

*Reported monthly in the *Toxicity Testing Report* by the Biology Section.

D= Daily W= Weekly M= Monthly Q= Quarterly S= Semi-Annual

		FREQUENCY OF ANALYSIS			
Constituent	Type of Sample	Influent	Effluent	Comb_Effluent	Reclaim
BACKROUND INFORMATION TESTING					
Total Dissolved Solids	24hr Composite	D			
Volatile Suspended Solids	24hr Composite	D			
Pesticides, organophosphorus	24hr Composite	S	S	S	S
Cations (Ca^{2+}, Mg^{2+}, Li^{+},Na^{+},K^{+})	24hr Composite	M	M	Q	M
Anions	24hr Composite	M	M	Q	
Fe	24hr Composite	M	M	Q	
Oil and Grease	Grab	Q			Q
pH	Grab	D			
Settleable Solids	Grab	Q			
MBAS	24hr Composite	Q	Q	Q	
Turbidity	24hr Composite	Q			
Sb, Be, Tl	24hr Composite	M			M
Se	24hr Composite	M			M
Ammonia-Nitrogen	24hr Composite	Q			Q
Cyanide	24hr Composite				Q
Acrolein and Acrylonitrile	Grab	Q			Q
Base/Neutral Compounds	24hr Composite	Q			Q
Benzidines	24hr Composite	Q			Q
Dioxin	24hr Composite	M			Q
Pesticides, chlorinated	24hr Composite	M			Q
Phenols, non-chlorinated	24hr Composite	M			Q
Phenols, chlorinated	24hr Composite	M			Q
Polychlorinated Biphenyls	24hr Composite	Q			Q
Tri, Di, & monobutyl tins	24hr Composite	Q			Q
Percent Sodium	24hr Composite		M	Q	
Purgeable (Volatile) Compounds	Grab	Q			Q
Radiation	24hr Composite	M			Q

E. Methods of Analysis

WASTEWATER INFLUENT and EFFLUENT (General)

Analyte	Description	Instrumentation	Reference[1]
Alkalinity	Selected Endpoint Titration	Mettler DL-21 & 25 Titrator Orion 950	(h) 2320 B
Ammonia Nitrogen	Distillation and Titration	Buchi Distillation Unit K-314 Orion 950	(h) 4500-NH3 B & E
Biochemical Oxygen Demand (BOD-5 Day)	Dissolved Oxygen Probe	YSI-5000 DO Meter	(h) 5210 B
Biochemical Oxygen Demand (BOD-Soluble)	Dissolved Oxygen Probe	YSI-5000 DO Meter	(h) 5210 B
Chemical Oxygen Demand (COD)	Closed Reflux / Colorimetric	Hach DR-2010 UV/Vis spectrophotometer	(h) 5220 D
Conductivity	Wheatstone Bridge	YSI-3100 & 3200 Orion 115A Orion 250 Conductivity Meter	(h) 2510 B
Cyanide	Acid Digest-Distil / Colorimetric	Hach DR-4000/Vis	(h) 4500-CN E
Floating Particulates	Flotation Funnel	Mettler AX-105 Mettler AG 204 Balance	(h) 2530 B
Flow	Continuous Meter	Gould (pressure sensor), ADS (sonic sensor), or Venturi (velocity sensor)	
Hardness; Ca, Mg, Total	ICP-AES / Calculation	TJA IRIS	(a) 200.7 (h) 2340 B
Kjeldahl Nitrogen (TKN)	Micro-Digestion / Titration	Buchii & Mettler DL25	(h) 4500-NH3 B,C
Oil and Grease	Hexane Extraction / Gravimetric	Mettler AX-105 Balance	1664A
Organic Carbon (TOC)	Catalytic Oxidation / IR Water Production Laboratory)	Shimadzu ASI-5000	(bb) 5310 B
pH	Hydrogen+Reference Electrode	Various models of pH meters.	(h) 4500-H+ B
Radiation (alpha & beta)	Gross proportional counter (Truesdail Labs Inc.)	Protean IPC-9025 (alpha) Tennelec LB-50100 (beta)	(h) 7110 B
Solids, Dissolved-Total	Gravimetric @ 180^{o}C	Mettler AX-105 &AB204 Balance	(h) 2540 C
Solids, Settleable	Volumetric	Imhoff Cone	(h) 2540 F
Solids, Suspended-Total	Gravimetric @ 103-105^{o}C	Mettler AG204 & AX-105	(h) 2540 D
Solids, Suspended-Volatile	Gravimetric @ 500^{o}C	Mettler AG204 & AX-105	(h) 2540 E
Solids, Total	Gravimetric @ 103-105^{o}C	Mettler AG204 & AX-105	(a) 160.3
Solids, Total-Volatile	Gravimetric @ 500^{o}C	Mettler AG204 & AX-105	(a) 160.4
Temperature	Direct Reading	Fisher Digital Thermometer	(h) 2550 B
Turbidity	Nephelometer Turbidimeter	Hach 2100-N Meter Hach 2100-AN Meter	(h) 2130 B

[1] Reference listing is found following this listing of analytical methods.

INFLUENT and EFFLUENT (Anions)

Analyte	Description	Instrumentation	Reference[1]
Bromide, Chloride, Fluoride, Nitrate, Phosphate, Sulfate	Ion Chromatography	Dionex DX-500	(a) 300.0

WASTEWATER INFLUENT and EFFLUENT (Metals)

Analyte	Description	Instrumentation	Reference[1]
Aluminum	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Antimony	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Arsenic	Hydride Generation / AA	TJA Solaar M6	(h) 3114 C
Barium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Beryllium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Boron	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Cadmium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Calcium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Chromium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Cobalt	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Copper	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Iron	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Lead	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Lithium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Magnesium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Manganese	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Mercury	Cold Vapor Generation / AA	Leeman PS 200II	(h) 3112 B
Molybdenum	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Nickel	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Potassium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Selenium	Hydride Generation / AA	TJA Solaar M6	(h) 3114 C
Silver	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Sodium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Thallium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Vanadium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7
Zinc	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.7

[1] Reference listing is found following this listing of analytical methods.

WASTEWATER INFLUENT and EFFLUENT (Organics)

Analyte	**Description**	**Instrumentation**	**Reference**[1]
Acrolein and Acrylonitrile	Purge & Trap, GC-MSD	Tekmar/Dohrman 2016/3100C HP-5890GC / 5972MSD Capillary HP-624	(c) 8260 B
Base/Neutral Extractables	Basic / CH_2Cl_2 continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary DB-5.625	(a) 625 (aa)
Benzidines	HPLC- ED / UV/Vis Diode Array	Dionex DX-500 / PDA-100/ED-40 C-18 Luna 5um	(a) 605
Chlorinated Compounds	CH_2Cl_2 extraction, GC-ECD	Varian 3800 GC-ECD Varian 3800 GC-ECD RTX-5/60m : RTX-1701/60m	(a) 608
Dioxin	CH_2Cl_2 extraction, GC/MS/MS	Varian Saturn -MS-MS Varian 3800 GC	(a) 8280A
Organophosphorus Pesticides	CH_2Cl_2 extraction, hexane exchange, GC-PFPD	Varian 3800 GC-PFPD RTX-1 :RTX-50	(a) 622
Phenolic Compounds	Acidic / CH_2Cl_2 continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5.625	(a) 625 (aa)
Purgeables (VOCs)	Purge & Trap, GC-MSD	O-I Analytical Eclipse 4660/4552 HP-6890N GC / 5973N MSD Capillary J&W DB-624	(a) 8260B (aa)
Tri, Di, and Monobutyl Tin	CH_2Cl_2 extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m : RTX-50	(z)

[1] Reference listing is found following this listing of analytical methods.

LIQUID SLUDGE: Raw, Digested, and Filtrate (General)

Analyte	Description	Instrumentation	Reference[1]
Alkalinity	Selected Endpoint Titration	Mettler DL-25 Titrator Orion 950	(h) 2320 B
Cyanide	Acid Digest-Distil / Colorimetric	Hach DR/4000V	(h) 4500-CN E
pH	Hydrogen+Reference Electrode	Various models of pH meters.	(c) 9010 B
Radiation (alpha & beta)	Gross proportional counter (Truesdail Labs Inc.)	Protean IPC-9025 (alpha) Tennelec LB-50100 (beta)	(h) 7110 B
Sulfides	Acid Digest-Distil / Titration	Class A Manual Buret	(c) 9030 B
Sulfides, reactive	Distillation / Titration	Class A Manual Buret	7.3.4.2
Solids, Total	Gravimetric @ 103-105^{o}C	Mettler PM 4600 Mettler PG 5002-S Balance	(h) 2540 B
Solids, Total-Volatile	Gravimetric @ 500^{o}C	Mettler PM 4600 Mettler PG 5002-S Balance	(h) 2540 E

LIQUID SLUDGE: Raw, Digested, and Filtrate (Metals)

Analyte	Description	Instrumentation	Reference[1]
Aluminum	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Antimony	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Arsenic	Hydride Generation / AA	TJA Solaar M6	(c) 7062
Beryllium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Barium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Boron	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Cadmium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Chromium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Cobalt	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Copper	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Iron	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Lead	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Manganese	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Mercury	Cold Vapor Generation / AA	Leeman PS 200II	(c) 7471 A
Molybdenum	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Nickel	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Selenium	Hydride Generation / AA	TJA Solaar M6	(c) 7742
Silver	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Thallium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Vanadium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Zinc	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B

[1] Reference listing is found following this listing of analytical methods.

LIQUID SLUDGE: Raw, Digested, and Decant (Organics)

Analyte	Description	Instrumentation	Reference[1]
Acrolein and Acrylonitrile	Purge & Trap, GC-MSD	Tekmar/Dohrman 2016//3100C HP-5890GC / 5972MSD Capillary HP-624	(c) 8260 B (aa)
Base/Neutral Extractables	Basic / CH_2Cl_2 continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5MS	(a) 625 (aa)
Benzidines	HPLC-ED / UV/Vis Diode Array	Dionex DX-500 / PDA-40/ED-40 C-18 Luna 5um	(a) 605
Chlorinated Compounds	CH_2Cl_2 extraction, GC-ECD	Varian 3800 GC-ECD RTX-5/60m : RTX-1701/60m	(c) 8081 A
PCBs	CH_2Cl_2 extraction, GC-ECD	Varian 3800 GC-ECD RTX-5/60m : RTX-1701/60m	8082
Dioxin	CH_2Cl_2 extraction	Varian GC-MS/MS	(a) 8280A
Herbicides	HPLC-UV/Vis Diode Array	Dionex DX-500 / PDA-100 C-18 Hypersil 5um	(c) 8321
Organophosphorus Pesticides	CH_2Cl_2 extraction, hexane exchange, GC-PFPD	Varian 3800 GC-PFPD RTX-1 : RTX-50	(a) 622
Phenolic Compounds	Acidic / CH_2Cl_2 continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5MS	(a) 625 (aa)
Purgeables (VOCs)	Purge & Trap, GC-MSD	O-I Analytical Eclipse 4660/4552 HP-6890N GC / 5973N MSD Capillary J&W DB-624	(c) 8260 B (aa)
Tri, Di, and Monobutyl Tin	CH_2Cl_2 extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m : RTX-50	(z)

LIQUID SLUDGE: Raw, Digested, and Decant (Digester Gases)

Analyte	Description	Instrumentation	Reference[1]
Methane	Gas Chromatography	SRI 8610C GC	(h) 2720 C
Carbon Dioxide	Gas Chromatography	SRI 8610C GC	(h) 2720 C
Hydrogen Sulfide	Colorimetric	Draeger H2S 2/a	

[1] Reference listing is found following this listing of analytical methods.

DRIED SLUDGE: Metro Biosolids Center (General)

Analyte	**Description**	**Instrumentation**	**Reference[1]**
Cyanide	Acid Digest-Distillation Colorimetric	Hach DR/4000V UV/Vis	(c) 9010 A
Cyanide Reactive	Distillation / Colorimetric	Hach DR/4000V UV/Vis	7.3.3.2
pH	Hydrogen+Reference Electrode	Various models of pH meters.	(c) 9045 C
Radiation (alpha & beta)	Gross proportional counter (Truesdail Labs Inc.)	Protean IPC-9025 (alpha) Tennelec LB-50100 (beta)	(h) 7110 B
Sulfides	Acid Digest-Distil / Titration	Class A Manual Buret	(c) 9030 B
Sulfides, reactive	Distillation / Titration	Class A Manual Buret	7.3.4.2
Solids, Total	Gravimetric @ 103-105^{o}C	Denver PI-314 Balance	(h) 2540 B
Solids, Total-Volatile	Gravimetric @ 500^{o}C	Denver PI-314 Balance	(h) 2540 E

DRIED SLUDGE: Metro Biosolids Center (Metals)

Analyte	**Description**	**Instrumentation**	**Reference[1]**
Aluminum	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Antimony	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Arsenic	Hydride Generation / AA	TJA Solaar M6	(c) 7062
Barium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Beryllium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Boron	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Cadmium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Chromium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Cobalt	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Copper	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Iron	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Lead	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Manganese	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Mercury	Cold Vapor Generation / AA	Leeman PS 200II	(c) 7471 A
Molybdenum	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Nickel	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Selenium	Hydride Generation / AA	TJA Solaar M6	(c) 7742
Silver	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Thallium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Vanadium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Zinc	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B

Waste Extraction Test (WET)	Extraction with Sodium Citrate ICP-AES	Burrel wrist action shaker TJA IRIS	(r) Section 66261.100

[1] Reference listing is found following this listing of analytical methods.

DRIED SLUDGE: Metro Biosolids Center (Organics)

Analyte	**Description**	**Instrumentation**	**Reference**[1]
Acrolein and Acrylonitrile	Purge & Trap, GC-MSD	Tekmar/Dohrman P2AS/3100C HP-5890GC / 5972MSD Capillary HP-624	(c) 8260 B (aa)
Base/Neutral Extractables	CH_2Cl_2 /Acetone sonication extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5MS	(c) 8270 C (c) 3550 A (aa)
Benzidines	Basic / CH2Cl2 Sonication extraction	HP-6890GC / 5976MSD Capillary HP-5MS	(c) 8270C (c) 3550 A
Chlorinated Compounds	CH_2Cl_2 extraction, GC-ECD	Varian 3400 GC-ECD RTX-5/60m : RTX-1701/60m	(c) 8081 A
PCBs	CH_2Cl_2 extraction, GC-ECD	Varian 3400 GC-ECD RTX-5/60m : RTX-1701/60m	(c) 8082
Dioxin	Outside Contact (Severn Trent Labs)	GC-MS	(a) 8290
Herbicides	HPLC-UV/Vis Diode Array	Dionex DX-500 / PDA-40 C-18 Hypersil 5um	(c) 8321/3545
Organophosphorus Pesticides	CH_2Cl_2 extraction, hexane exchange, GC-PFPD	Varian 3800 GC-PFPD DB-1/30m DB-608/30m	(c) 8141 A
Phenolic Compounds	CH_2Cl_2 / Acetone sonication extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5MS	(c) 8270 C (c) 3550 A (aa)
Purgeables (VOCs)	Purge & Trap, GC-MSD	O-I Analytical Eclipse 4660/4552 HP-6890N GC / 5973N MSD Capillary J&W DB-624	(c) 8260 B
Tri, Di, and Monobutyl Tin	CH_2Cl_2 extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m DB-608/30m	(z)

[1] Reference listing is found following this listing of analytical methods.

OCEAN SEDIMENT (General)

Analyte	Description	Instrumentation	Reference[1]
Biochemical Oxygen Demand (BOD-5 Day)	Dissolved Oxygen Probe	YSI-5000 DO Meter	(h) 5210 B
Particle Size	Coarse fraction by sieve; fine fraction by laser scatter	Horiba LA-920	(v) 3-380
Sulfides	Acid Digest-Distil / IC-PAD	Dionex IC-PAD(Ag)	(x)
Solids, Total	Gravimetric @ 103-105^{o}C	AND HM-120	(h) 2540 B
Solids, Total-Volatile	Gravimetric @ 500^{o}C	AND HM-120	(h) 2540 E
Total Organic Carbon (TOC) and Total Nitrogen (TN)	Combustion / GC-TCD	Carlo-Erba NC-2500 Porapak QS	(#)

OCEAN SEDIMENT (Metals)

Analyte	Description	Instrumentation	Reference[1]
Aluminum	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Antimony	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Arsenic	Hydride Generation / AA	TJA **Solaar M6**	(c) 7062
Beryllium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Cadmium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Chromium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Copper	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Iron	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Lead	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Manganese	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Mercury	Cold Vapor Generation / AA	Leeman PS 200II	(c) 7471 A
Nickel	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Selenium	Hydride Generation / AA	TJA **Solaar M6**	(c) 7742
Silver	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Thallium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Tin	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Zinc	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B

[1] Reference listing is found following this listing of analytical methods.

OCEAN SEDIMENT (Organics)

Analyte	Description	Instrumentation	Reference[1]
Base/Neutral Extractables	CH_2Cl_2 / Acetone ASE GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5MS	(c) 8270 C (aa)
Chlorinated Compounds	CH_2Cl_2 extraction, GC-ECD/MS/MS	Varian Saturn GC-ECD/MS/MS DBXLB/60m	(c) 8081 A
PCBs as Congeners	CH_2Cl_2 extraction, GC-ECD/MS/MS	Varian Saturn GC-ECD/MS/MS DBXLB/60m	(c) 8082
Organophosphorus Pesticides	CH_2Cl_2 extraction, hexane exchange, GC-PFPD	Varian 3800 GC-PFPD RTX-1 : RTX-50	(c) 8141 A
Tri, Di, and Monobutyl Tin	CH_2Cl_2 extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m : RTX_50	(z)

[1] Reference listing is found following this listing of analytical methods.

FISH TISSUE: Liver, Muscle, and Whole (General)

Analyte	Description	Instrumentation	Reference[1]
Solids, Total	Freeze Drying Gravimetric	Labconco Freezone 6 Mettler AG-104 Balance	(%)
Lipids	Hexane/Acetone Extraction Gravimetric	Dionex ASE-200 Mettler AG-104 Balance	(*)

FISH TISSUE: Liver, Muscle, and Whole (Metals)

Analyte	Description	Instrumentation	Reference[1]
Aluminum	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Antimony	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Arsenic	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Beryllium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Cadmium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Chromium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Copper	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Iron	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Lead	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Manganese	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Mercury	Cold Vapor Generation / AA	Leeman PS 200II	(a) 245.6
Nickel	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Selenium	Hydride Generation / AA	TJA **Solaar M6**	(c) 7742
Silver	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Thallium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Tin	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Zinc	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7

FISH TISSUE: Liver, Muscle, and Whole (Organics)

Analyte	**Description**	**Instrumentation**	**Reference[1]**
Base/Neutral Extractables	Basic / CH_2Cl_2 ASE extraction, GC-MSD	Dionex ASE-200 HP-5890GC / 5971MSD Capillary DB-XLB/30m	(c) 3545 / 8270 C
Chlorinated Compounds	CH_2Cl_2 extraction, GC-ECD/MS/MS	Varian 3800 GC Saturn 2000 MS-Ion Trap DB-XLB/60m	(c) 3545 / 8081 A
PCBs	CH_2Cl_2 extraction, hexane exchange, GC-ECD/MS/MS	Varian 3800 GC Saturn 2000 MS-Ion Trap DB-XLB/60m	(c) 3545 / 8082

[1] Reference listing is found following this listing of analytical methods.

Method References: Methods of Analysis Used to Produce the Data Presented in this Report.

a) Methods for Chemical Analysis of Water and Wastes,
EPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio,
March 1979 (EPA-600/4-79-020), 1983 Revision, and March 1984 (EPA-600/4-84-017).

aa) U.S. EPA Contract Laboratory Program, Statement of Work for Organic Analysis,
Multi-Media, Multi-Concentration, 7/85 revision and 1/91 revision.

b) Standard Methods for the Examination of Water and Wastewater,
APHA, AWWA, WPCF, 16th Edition, 1985

bb) Standard Methods for the Examination of Water and Wastewater,
APHA, AWWA, WPCF, 17th Edition, 1989

c) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,
U.S. EPA Office of Solid Waste and emergency Response,
Washington, D.C. 20460, November 1986, SW-846, Third Edition.

g) Laboratory Procedures for the Examination of Seawater and Shellfish,
5th Edition, 1984, American Public Health Association.

h) Standard Methods for the Examination of Water and Wastewater,
APHA, AWWA, WPCF, 18th Edition, 1992.

j) Methods for Organic Analysis of Municipal and Industrial Wastewater,
EPA-600/4-82-057, July 1982.

o) Official Methods of Analysis, 15th Edition,
Association of Official Analytical Chemists (AOAC), 1990.

q) Federal Register, Vol. 56, No. 5, pp 636-643, January 8, 1991.

r) Criteria for Identification of Hazardous and Extremely Hazardous Wastes,
California Code of Regulations (CCR), Title 22.

t) "Direct Current Plasma (DCP) Optical Emission Spectrometric Method for Trace Elemental Analysis of Water and Wastes, Method AES0029", 1986, revised 1991, Applied Research Laboratories (ARL) Inc., 24911 Avenue Standford, Valencia, CA 91355.

u) Radiochemical Procedures Manual, EPA-520/5-84-006, August 1984 (EPA 1984a)
Eastern Environmental Radiation Facility, Montgomery, AL 36109.

v) Procedures for Handling and Chemical Analysis of Sediment and Water Samples,
Russel H. Plumb, Jr., May 1981, EPA/Corp of Engineers Technical Committee on
Criteria for Dredged and Fill Material, EPA Contract 4805572010.

w) California Administrative Code, Title 22, Division 4, Chapter 30, Section 66700.

x) DIONEX AU 107, R.D.Rocklin and E.L.Johnson, ANAL. CHEM., 1983, 55, 4

y) Manual of Analytical Methods For the Analysis of Pesticides In Humans and Environmental Samples, EPA-600/8-80-038, June 1980.

z) Adaptation of method by the Naval Ocean Systems Center, San Diego, Marine Environment Branch, San Diego, CA 92152-5000

#) "TOC/TN in Marine Sediments...", SCCWRP Annual Report, 1990-1991, and 1991-1992.

%) "A Guide to Freeze Drying for the Laboratory...", LABCONCO, 3-53-5/94-Rosse-5M-R3, 1994.

*) "Lipids Content in Fish Tissues via Accelerated Solvent Extraction...",WWChem, EMTS/MWWD, 1998

F. Laboratories Contributing Results used in this report.

1. Metropolitan Wastewater Chemistry Laboratory
   (EPA Lab Code: CA00380,
   ELAP Certificate: 1609)
   5530 Kiowa Drive
   La Mesa, CA 91942
   (619)668-3205
   All results except those listed below.

2. Point Loma Wastewater Chemistry Laboratory
   (EPA Lab Code: CA01435,
   ELAP Certificate: 2474)
   1902 Gatchell Road
   San Diego, CA 92106
   (619)221-8765
   Process control analyses and wet methods for the plant.

3. North City Wastewater Chemistry Laboratory
   (EPA Lab Code: CA01436,
   ELAP Certificate: 2477)
   4949 Eastgate Mall
   San Diego, CA 92121
   (858)824-6009
   Process control analyses and wet methods for the plant.

4. Metro Biosolids Center Chemistry Laboratory
   (EPA Lab Code: CA01437,
   ELAP Certificate: 2478)
   5240 Convoy Street
   San Diego, CA 92111
   (858)614-5834
   Process control analyses and wet methods for the plant.

5. South Bay Water Reclamation Plant
   (EPA Lab Code: CA01460,
   ELAP Certificate: 2539)
   2411 Dairy Mart Road
   San Diego, CA 92173
   619.428.7349
   Process control analyses and wet methods for the plant.

6. City of San Diego - Water Quality Laboratory
   (EPA Lab Code: CA00080,
   ELAP Certificate: 1058)
   5530 Kiowa Drive
   La Mesa, CA 91942
   (619)668-3237
   Total Organic Carbon in Wastewater

7. City of San Diego - Marine Microbiology and Vector Management
   (EPA LabCode: CA01393, ELAP Certificate: 2185)
   5530 Kiowa Drive
   La Mesa, CA 91942
   (619)668-3226
   Microbiology

8. City of San Diego - Toxicity Bioassay Laboratory
(EPA Lab Code: CA01302,
ELAP Certificate: 1989)
4918 Harbor Drive, Suite 101
San Diego, CA 92106
(619) 758-2347
Bioassays

9. Truesdail Laboratories, Inc.
(EPA Lab Code: CA09469,
ELAP Certificate: 1237)
14201 Franklin Ave.
Tustin, CA 92780-7008
(714)730-6239
Gross Alpha/Beta Radioactivity and some mercury, arsenic and selenium values.

10. Severn Trent Labs
880 Riverside Parkway
Sacramento, CA 95605
NELAP Certification: 01119CA
Telephone# (916) 373-5600
Dioxins/Furans

G. Discharge Limits

NPDES Permit No. CA0109045/RWQCB Order No. 2000-129

DISCHARGE SPECIFICATIONS from NPDES Permit No. CA0109045/RWQCB Order No. 2000-129 effective on September 13, 2000 with limits on pollutant discharges.

The discharge of waste through the South Bay Ocean Outfall containing pollutants in excess of the following effluent limitations are prohibited:

NPDES Permit No. CA0109045/RWQCB Order No. 2000-129						
Constituent	Units	6-month Median	30-day Average	7-Day Average	Daily Maximum	Instantaneous Maximum
Biochemical Oxygen Demand BOD_5 @ 20EC	mg/L lb/day		30 3,750	45 5,630		50 6,260
Total Suspended Solids[1]	mg/L lb/day		30 3,750	45 5,630		50 6,260
pH	pH units		Within the limits of 6.0 - 9.0 at all times.			
Grease & Oil	mg/L lb/day		25 3,130	40 5,000		75 9,380
Settleable Solids	mL/L		1.0	1.5		3.0
Turbidity	NTU		75	100		225
Acute Toxicity	TUa				6.5	
Arsenic	ug/L	510			2,900	7,800
Cadmium	ug/L	100			400	1,000
Chromium[2] (Hexavalent)	ug/L	200			810	2,000
Copper	ug/L	100			1,000	2,800
Lead	ug/L	200			810	2,000
Mercury	ug/L	4.0			16.0	40
Nickel	ug/L	510			2,000	5,100
Selenium	ug/L	1,500			6,100	15,000
Silver	ug/L	29			165	438
Zinc	ug/L	1,200			7,300	19,000
Cyanide	mg/L	0.1			0.4	1.0
Total Residual Chlorine(TRC)	mg/L	0.200			0.81	6.1
Ammonia (expressed as Nitrogen)	mg/L	61			240	610
Chronic Toxicity	TUc				100	
Phenolic Compounds (non- chlorinated)	ug/L	3,000			12,000	30,000

[1] Total Suspended Solids (TSS)- The discharger shall achieve a mass emission of TSS of no greater than 13,995 mt/yr; this requirement shall be effective through December 31, 2005. Effective January 1, 2006, the discharger shall achieve a mass emission of TSS of no greater than 13,599 mt/yr. These mass emission requirements shall only apply to TSS discharged from POTWs which are owned and operated by the discharger, and the discharger's wastewater generated in the Metro System service area. These mass emission requirements do not apply to wastewater (and the resulting TSS) generated in Mexico as a result of upset or shutdown and treated at and discharged from the PLMWTP.

[2] Hexavalent Chromium limit met as Total Chromium.

NPDES Permit No. CA0109045/RWQCB Order No. 2000-129

Constituent	Units	6-month Median	30-day Average	7-Day Average	Daily Maximum	Instantaneous Maximum
Chlorinated Phenolics	ug/L	100			400	1,000
Endosulfan	ng/L	910			1,800	2,700
Endrin	ng/L	200			400	610
HCH (hexachlorocyclohexanes)	ng/L lb/day	400			810	1,200
Radioactivity - Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30269 of the California Code of Regulations.						

Note: mg/L= milligrams per liter
ug/L = micrograms per liter
ng/L = nanograms per liter
lb/day= pounds per day
NTU = Nephelometric turbidity units
TUa = Acute toxicity units
TUc = Chronic toxicity units

NPDES Permit No. CA0109045/RWQCB Order No. 2000-129

Constituent	Units	Monthly Average (30-Day)
LIMITATIONS FOR PROTECTION OF HUMAN HEALTH--NONCARCINOGENS		
Acrolein	ug/L	22,000
Antimony	ug/L	120,000
Bis(2-chloroethoxy) methane	ug/L	440
Bis(2-chloroisopropyl) ether	ug/L	120,000
Chlorobenzene	ug/L	58,000
Chromium (III)[3]	ug/L	19,000,000
di-n-butyl phthalate	ug/L	350,000
Dichlorobenzenes	ug/L	520,000
Diethyl phthalate	ug/L	3,300,000
Dimethyl phthalate	ug/L	83,000,000
4,6-dinitro-2-methylphenol	ug/L	22,000
2,4-dinitrophenol	ug/L	400
Ethylbenzene	ug/L	410,000
Fluoranthene	ug/L	1,500
Hexachlorocyclopentadiene	ug/L	5,900
Nitrobenzene	ug/L	490
Thallium	ug/L	1,400
Toluene	ug/L	8,500,000
Tributyltin	ug/L	0.14
1,1,1-trichloroethane	ug/L	54,000,000
Isophorone	ug/L	150,000
1,1,2-trichloroethane	ug/L	4,300,000
1,1-dichloroethylene	ug/L	720,000
1,1,2,2-tetrachloroethane	ug/L	120,000

[3] Chromium (III) limit is met by Total Chromium.

NPDES Permit No. CA0109045/RWQCB Order No. 2000-129

Constituent	Units	Monthly Average (30-Day)
LIMITATIONS FOR PROTECTION OF HUMAN HEALT—CARCINOGENS		
Acrylonitrile	ug/L	10
Aldrin	ng/L	2.2
Benzene	ug/L	600
Benzidine	ug/L	0.0069
Beryllium	ug/L	3.3
Bis(2-chloroethyl)ether	ug/L	4.5
Bis(2-ethylhexyl)phthalate	ug/L	350
Carbon Tetrachloride	ug/L	90
Chlordane	ng/L	2.3
Chloroform	ug/L	13,000
DDT	ng/L	17
1,4-dichlorobenzene	ug/L	1,800
3,3-dichlorobenzidine	ug/L	0.81
1,2-dichloroethane	ug/L	1,300
Dichloromethane	ug/L	45,000
1,3-dichloropropene	ug/L	890
Dieldrin	ng/L	4.0
2,4-dinitrotoluene	ug/L	260
1,2-diphenylhydrazine	ug/L	16
Halomethanes	ug/L	13,000
Heptachlor	ng/L	72
Hexachlorobenzene	ug/L	21,000
Hexachlorobutadiene	ug/L	1,400
Hexachloroethane	ug/L	250
N-nitrosodimethylamine	ug/L	730
N-nitrosodiphenylamine	ug/L	250
PAHs	ug/L	0.88
PCBs	ng/L	1.9
TCDD equivalents	pg/L	0.39
Tetrachloroethylene	ug/L	9,900
Toxaphene	ng/L	21.0
Trichloroethylene	ug/L	2,700
Vinyl Chloride	ug/L	3,600

H. Laboratory Accreditation Certificate

Our wastewater laboratory consists of a main laboratory with four satellite laboratories, one at each wastewater treatment plant (Point Loma Wastewater Treatment Plant, North City Water Reclamation Plant, South Bay Wastewater Reclamation Plant, and the Metro Biosolids Center). The main laboratory performs analyses for permit regulated parameters. The Point Loma, North City, and Metro Biosolids Center laboratories perform some of our permit regulated analyses, as well as process control analyses. All of our laboratories are California Environmental Laboratory Accreditation Program (ELAP) Certified Laboratories. A copy of all the Laboratory Certifications from the California Department of Health Services (DOHS), Environmental Laboratory Accreditation Program (ELAP) follows.

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

ENVIRONMENTAL LABORATORY CERTIFICATION

Is hereby granted to

SOUTH BAY WASTEWATER CHEMISTRY LABORATORY

CITY of SAN DIEGO - ENVIRONMENTAL MONITORING & TECH

2411 DAIRY MART ROAD

SAN DIEGO, CA 92173

Scope of certification is limited to the
"Accredited Fields of Testing"
which accompanies this Certificate.

Continued certification status depends on successful completion of site visit, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of Section 100825, et seq. of the Health and Safety Code.

Certificate No: **2539**
Expiration Date: **01/31/2007**
Effective Date: **01/01/2005**

Berkeley, California
subject to forfeiture or revocation.

George C. Kulasingam, Ph.D.
Program Chief
Environmental Laboratory Accreditation Program

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

SOUTH BAY WASTEWATER CHEMISTRY LABORATORY **Lab Phone** (619) 668-3212
CITY of SAN DIEGO - ENVIRONMENTAL MONITORING & TECH
2411 DAIRY MART ROAD
SAN DIEGO, CA 92173

Certificate No: 2539 **Renew Date: 01/31/2007**

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.080	001	Residue, Total	EPA 160.3
108.090	001	Residue, Volatile	EPA 160.4
108.390	001	Turbidity	SM2130B
108.410	001	Alkalinity	SM2320B
108.430	001	Conductivity	SM2510B
108.441	001	Residue, Filterable	SM2540C
108.442	001	Residue, Non-filterable	SM2540D
108.443	001	Residue, Settleable	SM2540F
108.465	001	Chlorine	SM4500-Cl G
108.490	001	pH	SM4500-H+ B
108.502	001	Ammonia	SM4500-NH3 E
108.530	001	Dissolved Oxygen	SM4500-O C
108.590	001	Biochemical Oxygen Demand	SM5210B
108.591	001	Carbonaceous BOD	SM5210B
108.602	001	Chemical Oxygen Demand	SM5220D
108.640	001	Surfactants	SM5540C

As of 06/03/2005 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

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STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

ENVIRONMENTAL LABORATORY CERTIFICATION

Is hereby granted to

ALVARADO WASTEWATER CHEMISTRY LAB.

CITY OF SAN DIEGO ENVIRONMENTAL MONITORING & TECHNICAL SERVICES DIV.

5530 KIOWA DRIVE

LA MESA, CA 91942-1331

Scope of certification is limited to the
"Accredited Fields of Testing"
which accompanies this Certificate.

Continued certification status depends on successful completion of site visit, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **1609**

Expiration Date: **08/31/2007**

Effective Date: **08/01/2005**

Berkeley, California
subject to forfeiture or revocation

George C. Kulasingam, Ph.D.
Program Chief
Environmental Laboratory Accreditation Program

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

ALVARADO WASTEWATER CHEMISTRY LAB. **Lab Phone** (619) 668-3214
CITY OF SAN DIEGO ENVIRONMENTAL MONITORING & TECHNICAL
5530 KIOWA DRIVE
LA MESA, CA 91942-1331

Certificate No: 1609 **Renew Date:** **8/31/2007**

Field of Testing: 108 - Inorganic Chemistry of Wastewater			
108.080	001	Residue, Total	EPA 160.3
108.090	001	Residue, Volatile	EPA 160.4
108.112	001	Boron	EPA 200.7
108.112	002	Calcium	EPA 200.7
108.112	003	Hardness (calc.)	EPA 200.7
108.112	004	Magnesium	EPA 200.7
108.112	005	Potassium	EPA 200.7
108.112	007	Sodium	EPA 200.7
108.120	001	Bromide	EPA 300.0
108.120	002	Chloride	EPA 300.0
108.120	003	Fluoride	EPA 300.0
108.120	004	Nitrate	EPA 300.0
108.120	007	Phosphate, Ortho	EPA 300.0
108.120	008	Sulfate	EPA 300.0
108.263	001	Phosphorus, Total	EPA 365.2
108.390	001	Turbidity	SM2130B
108.410	001	Alkalinity	SM2320B
108.430	001	Conductivity	SM2510B
108.441	001	Residue, Filterable	SM2540C
108.442	001	Residue, Non-filterable	SM2540D
108.443	001	Residue, Settleable	SM2540F
108.470	001	Cyanide, Manual Distillation	SM4500-CN C
108.472	001	Cyanide, Total	SM4500-CN E
108.490	001	pH	SM4500-H+ B
108.530	001	Dissolved Oxygen	SM4500-O C
108.590	001	Biochemical Oxygen Demand	SM5210B
108.591	001	Carbonaceous BOD	SM5210B
108.602	001	Chemical Oxygen Demand	SM5220D
Field of Testing: 109 - Toxic Chemical Elements of Wastewater			
109.010	001	Aluminum	EPA 200.7
109.010	002	Antimony	EPA 200.7
109.010	004	Barium	EPA 200.7
109.010	005	Beryllium	EPA 200.7
109.010	007	Cadmium	EPA 200.7
109.010	009	Chromium	EPA 200.7

As of 1/18/2007 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

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ALVARADO WASTEWATER CHEMISTRY LAB.

Certificate No: 1609
Renew Date: 8/31/2007

109.010	010	Cobalt	EPA 200.7
109.010	011	Copper	EPA 200.7
109.010	012	Iron	EPA 200.7
109.010	013	Lead	EPA 200.7
109.010	015	Manganese	EPA 200.7
109.010	016	Molybdenum	EPA 200.7
109.010	017	Nickel	EPA 200.7
109.010	021	Silver	EPA 200.7
109.010	023	Thallium	EPA 200.7
109.010	024	Tin	EPA 200.7
109.010	026	Vanadium	EPA 200.7
109.010	027	Zinc	EPA 200.7
109.400	001	Mercury	SM3112B
109.420	001	Arsenic	SM3114B
109.420	002	Selenium	SM3114B
Field of Testing: 110 - Volatile Organic Chemistry of Wastewater			
110.040	040	Halogenated Hydrocarbons	EPA 624
110.040	041	Aromatic Compounds	EPA 624
110.040	042	Oxygenates	EPA 624
110.040	043	Other Volatile Organics	EPA 624
Field of Testing: 111 - Semi-volatile Organic Chemistry of Wastewater			
111.020	000	Benzidines	EPA 605
111.101	032	Polynuclear Aromatic Hydrocarbons	EPA 625
111.101	034	Phthalates	EPA 625
111.170	030	Organochlorine Pesticides	EPA 608
111.170	031	PCBs	EPA 608
Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste			
114.010	001	Antimony	EPA 6010B
114.010	003	Barium	EPA 6010B
114.010	004	Beryllium	EPA 6010B
114.010	005	Cadmium	EPA 6010B
114.010	006	Chromium	EPA 6010B
114.010	007	Cobalt	EPA 6010B
114.010	008	Copper	EPA 6010B
114.010	009	Lead	EPA 6010B
114.010	010	Molybdenum	EPA 6010B
114.010	011	Nickel	EPA 6010B
114.010	013	Silver	EPA 6010B
114.010	014	Thallium	EPA 6010B
114.010	015	Vanadium	EPA 6010B
114.010	016	Zinc	EPA 6010B
114.051	001	Arsenic	EPA 7062
114.140	001	Mercury	EPA 7470A

As of 1/18/2007 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

ALVARADO WASTEWATER CHEMISTRY LAB.

Certificate No: 1609
Renew Date: 8/31/2007

114.141	001	Mercury	EPA 7471A
114.172	001	Selenium	EPA 7742
114.222	001	Cyanide	EPA 9014
114.230	001	Sulfides, Total	EPA 9034
Field of Testing: 115 - Extraction Test of Hazardous Waste			
115.030	001	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II
Field of Testing: 116 - Volatile Organic Chemistry of Hazardous Waste			
116.080	000	Volatile Organic Compounds	EPA 8260B
116.080	120	Oxygenates	EPA 8260B
116.100	001	Total Petroleum Hydrocarbons - Gasoline	LUFT GC/MS
Field of Testing: 117 - Semi-volatile Organic Chemistry of Hazardous Waste			
117.015	001	Diesel-range Total Petroleum Hydrocarbons	LUFT GC/MS
117.110	000	Extractable Organics	EPA 8270C
117.210	000	Organochlorine Pesticides	EPA 8081A
117.220	000	PCBs	EPA 8082
Field of Testing: 120 - Physical Properties of Hazardous Waste			
120.040	001	Reactive Cyanide	Section 7.3 SW-846
120.050	001	Reactive Sulfide	Section 7.3 SW-846
120.080	001	Corrosivity - pH Determination	EPA 9045C

As of 1/18/2007 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

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STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

ENVIRONMENTAL LABORATORY CERTIFICATION

Is hereby granted to

PT. LOMA WASTEWATER CHEMISTRY LAB

CITY OF SAN DIEGO ENVIRONMENTAL MONITORING

1902 GATCHELL ROAD

SAN DIEGO, CA 92106

Scope of certification is limited to the
"Accredited Fields of Testing"
which accompanies this Certificate.

Continued certification status depends on successful completion of site visit, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **2474**

Expiration Date: **07/31/2007**

Effective Date: **07/01/2005**

Berkeley, California
subject to forfeiture or revocation

George C. Kulasingam, Ph.D.
Program Chief
Environmental Laboratory Accreditation Progra

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

PT. LOMA WASTEWATER CHEMISTRY LAB **Lab Phone** (619) 668-3222
CITY OF SAN DIEGO ENVIRONMENTAL MONITORING
1902 GATCHELL ROAD
SAN DIEGO, CA 92106

Certificate No: 2474 **Renew Date: 07/31/2007**

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.080	001	Residue, Total	EPA 160.3
108.090	001	Residue, Volatile	EPA 160.4
108.380	001	Oil and Grease	EPA 1664
108.390	001	Turbidity	SM2130B
108.410	001	Alkalinity	SM2320B
108.421	001	Hardness	SM2340C
108.430	001	Conductivity	SM2510B
108.441	001	Residue, Filterable	SM2540C
108.442	001	Residue, Non-filterable	SM2540D
108.443	001	Residue, Settleable	SM2540F
108.490	001	pH	SM4500-H+ B
108.500	001	Ammonia	SM4500-NH3 C
108.502	001	Ammonia	SM4500-NH3 E
108.530	001	Dissolved Oxygen	SM4500-O C
108.590	001	Biochemical Oxygen Demand	SM5210B
108.591	001	Carbonaceous BOD	SM5210B
108.601	001	Chemical Oxygen Demand	SM5220C
108.630	001	Oil and Grease	SM5520B
108.670	001	Nitrite	HACH8507
108.672	001	Phosphate, Ortho	HACH8048

As of 02/14/2006 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

I. Staff Contributing to this Report

Initials	ID	First Name	Last Name	Signature
BOA	BOA	Ben	Andoh	
TB	TSB	Tan	Bao	
VB	VFB	Virginia	Basilan	
EB	BTX	Enrique	Blanco	
BGB	N8B	Brent	Bowman	
TB	TMB	Tom	Burger	
DC	DVC	Doug	Campbell	
LC	UEC	Laura	Carr	
LC	G3C	Jose	Castro	
JCM	U8C	Jacqueline	Cazares-Medina	
CC	I5C	CC	Chou	
NC	NLC	Nancy	Coglan	
MC	M5C	Maricela	Coronel	
JCM	G8C	Jerry	Czajkowski	
KD	KOD	Ken	Dang	
HHD	HZD	Heather	Duckett	
ACD	AD4	Angelica	Duran	
SE	SZE	Steve	Evans	
JF	JRF	Jeff	Findley	
KG	KG3	Kenneth	Genz	
RJ	RCJ	Ron	Jardine	
LK	LNK	Lee	King	
EL	EVL	Estela	Lanez	
AM	M5U	Armando	Martinez	
FM	YBM	Fernando	Martinez	
ConnieM	M4M	Connie	Mata	
SWM	SWM	Steve	Meyer	
FM	IZM	Francisco	Meza	
JM	G7M	Jeff	McAnally	
JN	IEN	Jesus	Nieto	
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MS	D8U	Miles	Slattery	
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SV	SCV	Sandra	Valenzuela	
GV	JRV	Gabriel	Velarde	
JW	AIW	Julie	Webb	
KW	KLW	Kristof	Witczak	
MZ	MZ	Maria	Zapata	

Figure 1. Chemistry Laboratory Organization Chart. (2007)

Metropolitan Wastewater Department
Environmental Monitoring and Technical Services Division
Wastewater Chemistry Services

Deputy Director
Alan Langworthy

***Senior Chemist** 1.00*
Steve Meyer

Pesticides/ Wet Chemistry Group	***QA/DM Group***	***Metals Group***	***Southern Services Group***	***Northern Services Group***	***GC/MS Group***
Associate Chemist 1.00 JEFF MCANALLY	*Associate Chemist 1.00* BRENT BOWMAN	*Associate Chemist 1.00* DAVID SCHLICKMAN	*Associate Chemist 1.00* ROBERT SANDOVAL	*Associate Chemist 1.00* NANCY COGLAN	*Associate Chemist 1.00* Vacant - TBD BRENT BOWMAN (temporary)
Assistant Chemists: 9.00 TAN BAO CC CHOU KEN DANG MARIA ZAPATA SANDRA VALENZUELA JACQUELINE CAZARES-MEDINA HEATHER DUCKETT MICHAEL STEWART RONALD JARDINE	*Assistant Chemists: 4.00* LEE KING TOM BURGER Vacant Vacant	*Assistant Chemists: 5.00* BEN ANDOH JERRY CZAJKOWSKI JEFF FINDLEY JESUS NIETO LEONARD PRZYBYLO GLORIA SIQUEIROS	*Assistant Chemists: 5.00* JULIE WEBB GREG SCHLIMME ENRIQUE BLANCO ESTELA LANEZ FERNANDO MARTINEZ	*Assistant Chemists: 4.00* VIRGINIA BASILAN KRIS WITCZAK LAURA CARR LORENA PANTOJA	*Assistant Chemists: 3.00* FRANCISCO MEZA STEVE EVANS DOUG CAMPBELL
Laboratory Technician: 1.00 Vacant	*Laboratory Technician: 2.00* ARMANDO MARTINEZ MARGOT SZETERLAK	*Laboratory Technician: 1.00* Vacant	*Laboratory Technician: 4.00* MARICELA CORONEL CONNIE MATA JOSE CASTRO Vacant	*Laboratory Technician: 2.00* ANGELICA DURAN KENNETH GENZ	*Laboratory Technician: 0.00*
Intern:	*Word Processing Operator: 1.00* CORINNA QUINATA *Intern:*	Intern:			

J. Acknowledgements

South Bay Wastewater Reclamation Plant and Ocean Outfall Annual Monitoring Report 2006

City of San Diego
Metropolitan Wastewater Department

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Ernesto Molas

Senior Plant Technician Supervisor
Bill Graham

WW Operations Supervisor- Process Control
Linda Ruiz Lopez

Senior Civil Engineer
Mike Faramarzi