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A. 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).
N-1-P - North Digester Number 1, Primary, Pt. Loma
N-2-P - North Digester Number 2, Primary, Pt. Loma
C-1-P - Central Digester Number 1, Primary, Pt. Loma
C-2-P - Central Digester Number 2, Primary, Pt. Loma
S-1-P - South Digester Number 1, Primary, Pt. Loma
S-2-P - South Digester Number 2, Primary, Pt. Loma
Dig 7 - Digester Number 7, Primary, Pt. Loma
Dig 8 - Digester Number 8, Primary, Pt. Loma
DIG COMP - Digested Biosolids Composite; a composite of grabs taken from each of the in-service digesters.
RAW COMP - A Composite of Raw Sludge taken over the preceding 24 hrs.
NCWRP- North City Water Reclamation Plant
N01-PS_INF - The plant primary Influent from Pump Station 64
N01-PEN - The plant primary Influent from the Penasquitos pump station.
N30-DFE - Disinfected Final Effluent
N34-REC WATER - Reclaimed Water.
N10-PSP COMB - raw sludge
N15-WAS LCP - Waste Activated Sludge – low capacity pumps
MBC - Metro Biosolids Center
MBCDEWCN - Metro Biosolids Center Dewatering Centrifuges; typically the dewatered biosolids from these.
MBC_COMBCN - MBC Combined Centrate; the centrate from all the dewatering centrifuges.
(The return stream from MBC to the sewer system.)
MBC_NC_DSL - North City to Metropolitan Biosolids Center (MBC) Digested Sludge Line.
Dig 1 - MBC Digester number 1.
Dig 2 - MBC Digester number 2.
Dig 3 - MBC Digester number 3.
Biosolids - In most cases Biosolids and digested (a processed) Sludge is synonymous.

UNITS

mg/L milligrams per liter
ug/L micrograms per liter = 0.001 mg/L
ng/L nanograms per liter = 0.001 ug/L
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
pCi/L or pCi/L pico curies per liter
TU toxicity units
ntu nephelometric turbidity units
°C degrees Celsius = degrees centigrade
MGD million gallons per day
umhos/cm. micromhos per centimeter
uS microsiemens = umhos
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	MDL Method Detection Limit
BOD Biochemical Oxygen Demand	MSD Mass Spectroscopy Detector
CN ⁻ Cyanide	NH ₃ Ammonia
COD Chemical Oxygen Demand	NH ₃ -N Ammonia Nitrogen
Cr ⁶⁺ Hexavalent Chromium	NH ₄ ⁺ Ammonium ion
D.O. Dissolved Oxygen	NO ₃ ⁻ Nitrate
DDD Dichlorodiphenyldichloroethane (a.k.a. TDE-tetrachlorodiphenylethane)	PAD Pulsed Amperometric Detector
DDE Dichlorodiphenyldichloroethylene	PCB Polychlorinated Biphenyls
DDT Dichlorodiphenyltrichloroethane	PO ₄ ³⁻ Phosphate
FeCl ₃ Ferric Chloride	SO ₄ ²⁻ Sulfate
G&O Grease and Oil	SS Suspended Solids
GC Gas chromatography.	TBT Tributyl tin
GC-ECD-Electron Capture Detector.	TCH Total Chlorinated Hydrocarbons (i.e. chlorinated pesticides & PCB's)
GC-FID-Flame Ionization Detector.	TCLP Toxicity Characteristic Leaching Procedure
GC-FPD-Flame Photometric Detector.	TDS Total Dissolved Solids
GC-MS-Mass Spectroscopy.	TS Total Solids
H ₂ S Hydrogen Sulfide	TVS Total Volatile Solids
Hg Mercury	VSS Volatile Suspended Solids
IC Ion Chromatography	
ICP-AES Inductively Coupled Plasma-Atomic Emission Spectroscopy	

B. Methods of Analysis

WASTEWATER INFLUENT and EFFLUENT (General)

Analyte	Description	Instrumentation	Reference ¹
Alkalinity	Selected Endpoint Titration	Mettler DL-21 & 25 Titrator Orion 950	(g) 2320 B
Ammonia Nitrogen	Distillation and Titration	Buchi Distillation Unit K-314 Orion 950	(i) 4500-NH3 B & E
Biochemical Oxygen Demand (BOD-5 Day)	Dissolved Oxygen Probe	YSI-5000 DO Meter	(i) 5210 B
Biochemical Oxygen Demand (BOD-Soluble)	Dissolved Oxygen Probe	YSI-5000 DO Meter	(i) 5210 B
Chemical Oxygen Demand (COD)	Closed Reflux / Colorimetric	Hach DR-2010 UV/Vis spectrophotometer	(i) 5220 D
Conductivity	Wheatstone Bridge	YSI-3100, YSI-3200, Orion 115A, Orion 250 Conductivity Meter	(g) 2510 B
Cyanide	Acid Digest/Distil / Colorimetric	Hach DR-4000/Vis	(i) 4500-CN E
Floating Particulates	Flotation Funnel	Mettler AX-105 Mettler AG 204 Balance	(g) 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)	Macro-Digestion / Titration	Labconco digestion block Buchi B-324 distiller & Mettler DL25 titrator	(i) Digestion= 4500-Norg B
Oil and Grease	Hexane Extraction / Gravimetric	Mettler AX-105 Balance	(a) 1664A
Organic Carbon (TOC)	Catalytic Oxidation / IR (Water Production Laboratory)	Shimadzu ASI-5000	(f) 5310 B
pH	Hydrogen+Reference Electrode	Various models of pH meters.	(g) 4500-H+ B
Radiation (alpha & beta)	Alpha Spectroscopy Gamma Spectroscopy	Canberra 7401 (alpha) Canberra GC25185 (beta)	(h) 7110 B
Solids, Dissolved-Total	Gravimetric @ 180oC	Mettler AX-105 & AB204 Meter	(i) 2540 C
Solids, Settleable	Volumetric	Imhoff Cone	(g) 2540 F
Solids, Suspended-Total	Gravimetric @ 103-105oC	Mettler AG204 & AX-105	(i) 2540 D
Solids, Suspended-Volatile	Gravimetric @ 500oC	Mettler AG204 & AX-105	(i) 2540 E
Solids, Total	Gravimetric @ 103-105oC	Mettler AG204 & AX-105	(a) 160.3
Solids, Total-Volatile	Gravimetric @ 500oC	Mettler AG204 & AX-105	(a) 160.4
Temperature	Direct Reading	Fisher Digital Thermometer	(g) 2550 B
Turbidity	Nephelometer Turbidimeter	Hach 2100-N Meter Hach 2100-AN Meter	(g) 2130 B
Bromide, Chloride, Fluoride, Nitrate, Phosphate, Sulfate	Ion Chromatography	Dionex DX-500	(d) 300.0

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

WASTEWATER INFLUENT and EFFLUENT (Metals)

Analyte	Description	Instrumentation	Reference ¹
Aluminum	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Antimony	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Arsenic	Hydride Generation / AA	TJA Solaar M6	(hh) 3114 C
Barium	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Beryllium	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Boron	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Cadmium	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Calcium	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Chromium	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Cobalt	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Copper	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Iron	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Lead	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Lithium	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Magnesium	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Manganese	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Mercury	Cold Vapor Generation / AA	Leeman PS 200II	(g) 3112 B
Molybdenum	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Nickel	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Potassium	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Selenium	Hydride Generation / AA	TJA Solaar M6	(h) 3114 C
Silver	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Sodium	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Thallium	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Vanadium	Acid Digestion / ICP-AES	TJA IRIS	(e) 200.7
Zinc	Acid Digestion / ICP-AES	TJA IRIS	(e) 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	O-I Analytical Eclipse 4660/4552 HP-6890N GC / 5973N MSD Capillary J&W DB-624	(c) 8260 B
Base/Neutral Extractables	Basic / CH ₂ Cl ₂ continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary DB-5.625	(a) 625 (b)
Benzidines	HPLC- ED / UV/Vis Diode Array	Dionex DX-500 / PDA-100/ED- 40C-18 Luna 5um	(a) 605
Chlorinated Compounds	CH ₂ Cl ₂ extraction, GC-ECD	Varian 3800 GC-ECD Varian 3800 GC-ECD RTX-5/60m : RTX-1701/60m	(a) 608
Dioxin	CH ₂ Cl ₂ extraction, GC/MS/MS	Varian Saturn -MS-MS Varian 3800 GC	(a) 8280A
Organophosphorus Pesticides	CH ₂ Cl ₂ extraction, hexane exchange, GC-PFPD	Varian 3800 GC-PFPD RTX-1 :RTX-50	(a) 622
Phenolic Compounds	Acidic / CH ₂ Cl ₂ continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary DB-5.625	(a) 625 (b)
Purgeables (VOCs)	Purge & Trap, GC-MSD	O-I Analytical Eclipse 4660/4552 HP-6890N GC / 5973N MSD Capillary J&W DB-624	(a) 8260B (b)
Tri, Di, and Monobutyl Tin	CH ₂ Cl ₂ extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m : RTX-50	(l)

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	(g) 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)	(g) 7110 B
Radiation (alpha & beta)	Alpha Spectroscopy Gamma Spectroscopy	Canberra 7401 (alpha) Canberra GC25185 (beta)	(h) 7110 B
Sulfides	Acid Digest-Distil / Titration	Class A Manual Buret	(c) 9030 B
Sulfides, reactive	Distillation / Titration	Class A Manual Buret	(c) 7.3.4.2
Solids, Total	Gravimetric @ 103-105oC	Mettler PM 4600 Mettler PG 5002-S Balance	(i) 2540 B
Solids, Total-Volatile	Gravimetric @ 500oC	Mettler PM 4600 Mettler PG 5002-S Balance	(i) 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	O-I Analytical Eclipse 4660/4552 HP-6890N GC / 5973N MSD Capillary J&W DB-624	(c) 8260 B (b)
Base/Neutral Extractables	Basic / CH ₂ Cl ₂ continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary DB-5.625	(a) 625 (b)
Benzidines	HPLC-ED / UV/Vis Diode Array	Dionex DX-500 / PDA-40/ED-40 C-18 Luna 5um	(a) 605
Chlorinated Compounds	CH ₂ Cl ₂ extraction, GC-ECD	Varian 3800 GC-ECD RTX-5/60m : RTX-1701/60m	(c) 8081 A
PCBs	CH ₂ Cl ₂ extraction, GC-ECD	Varian 3800 GC-ECD RTX-5/60m : RTX-1701/60m	(c) 8082
Dioxin	CH ₂ Cl ₂ extraction	Varian GC-MS/MS	(c) 8280A
Herbicides	HPLC-UV/Vis Diode Array	Dionex DX-500 / PDA-100 C-18 Hypersil 5um	(c) 8321
Organophosphorus Pesticides	CH ₂ Cl ₂ extraction, hexane exchange, GC-PFPD	Varian 3800 GC-PFPD RTX-1 : RTX-50	(a) 622
Phenolic Compounds	Acidic / CH ₂ Cl ₂ continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary DB-5.625	(a) 625 (b)
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 (b)
Tri, Di, and Monobutyl Tin	CH ₂ Cl ₂ extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m : RTX-50	(l)

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

Analyte	Description	Instrumentation	Reference ¹
Methane	Gas Chromatography	SRI 8610C GC	(g) 2720 C
Carbon Dioxide	Gas Chromatography	SRI 8610C GC	(g) 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	(c) 7.3.3.2
pH	Hydrogen+Reference Electrode	Various models of pH meters.	(c) 9045 C
Radiation (alpha & beta)	Alpha Spectroscopy Gamma Spectroscopy	Canberra 7401 (alpha) Canberra GC25185 (beta)	(h) 7110 B
Sulfides	Acid Digest-Distil / Titration	Class A Manual Buret	(c) 9030 B
Sulfides, reactive	Distillation / Titration	Class A Manual Buret	(c) 7.3.4.2
Solids, Total	Gravimetric @ 103-105oC	Denver PI-314 Balance	(i) 2540 B
Solids, Total-Volatile	Gravimetric @ 500oC	Denver PI-314 Balance	(i) 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	(j) Section 66261.100
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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	O-I Analytical Eclipse 4660/4552 HP-6890N GC / 5973N MSD Capillary J&W DB-624	(c) 8260 B (b)
Base/Neutral Extractables	CH ₂ Cl ₂ / Acetone sonication extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary DB-5MS	(c) 8270 C (c) 3550 A (b)
Benzidines	Basic / CH ₂ Cl ₂ Sonication extraction	HP-6890GC / 5976MSD Capillary HP-5MS	(c) 8270C (c) 3550 A
Chlorinated Compounds	CH ₂ Cl ₂ extraction, GC-ECD	Varian 3400 GC-ECD RTX-5/60m : RTX-1701/60m	(c) 8081 A
PCBs	CH ₂ Cl 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 ₂ Cl ₂ extraction, hexane exchange, GC-PFPD	Varian 3800 GC-PFPD DB-1/30m DB-608/30m	(c) 8141 A
Phenolic Compounds	CH ₂ Cl ₂ / Acetone sonication extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary DB-5MS	(c) 8270 C (c) 3550 A (b)
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 ₂ Cl ₂ extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m DB-608/30m	(l)

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	(g) 5210 B
Particle Size	Coarse fraction by sieve; fine fraction by laser scatter	Horiba LA-920	(q) 3-380
Sulfides	Acid Digest-Distil / IC-PAD	Dionex IC-PAD(Ag)	(k)
Solids, Total	Gravimetric @ 103-105oC	AND HM-120	(g) 2540 B
Solids, Total-Volatile	Gravimetric @ 500oC	AND HM-120	(g) 2540 E
Total Organic Carbon (TOC) and Total Nitrogen (TN)	Combustion / GC-TCD	Carlo-Erba NC-2500 Porapak QS	(m)

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

OCEAN SEDIMENT (Organics)

Analyte	Description	Instrumentation	Reference ¹
Base/Neutral Extractables	CH ₂ Cl ₂ / Acetone ASE GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary DB-5MS	(c) 8270 C (b)
Chlorinated Compounds	CH ₂ Cl ₂ extraction, GC-ECD/MS/MS	Varian Saturn GC-ECD/MS/MS DBXLB/60m	(c) 8081 A
PCBs as Congeners	CH ₂ Cl ₂ extraction, GC-ECD/MS/MS	Varian Saturn GC-ECD/MS/MS DBXLB/60m	(c) 8082
Organophosphorus Pesticides	CH ₂ Cl ₂ extraction, hexane exchange, GC-PFPD	Varian 3800 GC-PFPD RTX-1 : RTX-50	(c) 8141 A
Tri, Di, and Monobutyl Tin	CH ₂ Cl ₂ extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m : RTX 50	(l)

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	(n)
Lipids	Hexane/Acetone Extraction Gravimetric	Dionex ASE-200 Mettler AG-104 Balance	(o)

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

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

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

Analyte	Description	Instrumentation	Reference ¹
Base/Neutral Extractables	Basic / CH ₂ Cl ₂ ASE extraction, GC-MSD	Dionex ASE-200 HP-5890GC / 5971MSD Capillary DB-XLB/30m	(c) 3545 / 8270 C
Chlorinated Compounds	CH ₂ Cl ₂ extraction, GC-ECD/MS/MS	Varian 3800 GC Saturn 2000 MS-Ion Trap DB-XLB/60m	(c) 3545 / 8081 A
PCBs	CH ₂ Cl 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).
- b) U.S. EPA Contract Laboratory Program, Statement of Work for Organic Analysis, Multi-Media, Multi-Concentration, 7/85 revision and 1/91 revision.
- 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. Revision 0 September 1994, December 1996, Revision 2
- d) The Determination of Inorganic Anions in Water by Ion Chromatography, Revision 2.1, August 1993
- e) The Determination of Metals and Trace Elements in Water and Waste Revision 4.4, EMMC Version, EMMC Methods Work Group, 1994
- f) Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WPCF, 17th Edition, 1989.
- g) Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WPCF, 18th Edition, 1992.
- h) Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WPCF, 19th Edition, 1995.
- i) Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WPCF, 20th Edition, 1998.
- j) Criteria for Identification of Hazardous and Extremely Hazardous Wastes, California Code of Regulations (CCR), Title 22.
- k) DIONEX AU 107, R.D.Rocklin and E.L.Johnson, ANAL. CHEM., 1986, 55, 4
- l) Adaptation of method by the Naval Ocean Systems Center, San Diego, Marine Environment Branch, San Diego, CA 92152-5000
- m) "TOC/TN in Marine Sediments...", SCCWRP Annual Report, 1990-1991, and 1991-1992.
- n) "A Guide to Freeze Drying for the Laboratory...", LABCONCO, 3-53-5/94-Rosse-5M-R3, 1994.
- o) "Lipids Content in Fish Tissues via Accelerated Solvent Extraction...", WWChem, EMTS/MWWD, 1998
- 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.

C. Frequency of analysis and Type of Sample - 2007

CONSTITUENT	Frequency	Sample Type	Permit Required		Comments	
			Influent	Effluent		
Process Control						
Biochemical Oxygen Demand -Total	Daily	Composite	X	X	Monday-Friday Same meter used	
Biochemical Oxygen Demand -Soluble	Daily	Composite				
Chemical Oxygen Demand	Weekly	Composite				
Conductivity	Weekly	Composite				
Floating Particulates	Daily	Composite	X	X		
Flow	Daily		X	X		
Oil and Grease	Daily	Grab	X	X		
pH	Daily	Grab	X	X		
Settleable Solids	Daily	Grab	X	X		
Temperature	Daily	Grab	X	X		
Total Dissolved Solids	Daily	Composite	X	X		
Total Solids	Weekly	Composite				
Total Suspended Solids	Daily	Composite	X	X		
Total Volatile Solids	Weekly	Composite				
Turbidity	Daily	Composite	X	X		
Volatile Suspended Solids	Daily	Composite	X	X		
Metals						
As,Cd,Cr,Cu,Pb,Hg,Ni,Se,Ag,Zn	Weekly	Composite	X	X	Req. Frequency=Monthly	
Sb, Be, Tl	Weekly	Composite	X	X		
Fe	Weekly	Composite				
Ions						
Alkalinity	Weekly	Composite			By calculation	
Ammonia-Nitrogen	Weekly	Composite	X	X		
Anions (F-,Cl-,Br-,SO42-,NO3-,PO43-)	Weekly	Composite				
Cations (Ca2+, Mg2+, Li+,Na+,K+)	Weekly	Composite				
Cyanide	Weekly	Composite	X	X		
Hardness (Total, Ca, Mg)	Weekly	Composite				
Organic Priority Pollutants						
Acrolein and Acrylonitrile	Monthly	Grab	X	X		Method 8260
Base/Neutral Compounds	Monthly	Composite	X	X	Method 625	
Benzidines	Monthly	Composite	X	X	Method 8280A	
Dioxin	Monthly	Composite	X	X		
Pesticides, chlorinated	Monthly	Composite	X	X	Method 8260	
Pesticides, organophosphorus	Semi-Annual	Composite				
Phenols, non-chlorinated	Weekly	Composite	X	X	Method 625	
Phenols, chlorinated	Weekly	Composite	X	X	Method 625	
Polychlorinated Biphenyls	Weekly	Composite	X	X	Method 8260	
Purgeable (Volatile) Compounds	Monthly	Grab	X	X		
Tri, Di, & monobutyl tins	Monthly	Composite	X	X		
Miscellaneous						
Radiation	Monthly	Composite	X	X	Performed by a contract lab. Reported in the monthly	
Toxicity (Acute & Chronic)	Monthly	Composite	X		Toxicity Testing Report by the Biology Section	

D. Laboratories Contributing Results used in this report.

- i. Metropolitan Wastewater Chemistry Laboratory (EPA Lab Code: CA00380, ELAP Certificate: 1609)
5530 Kiowa Drive
La Mesa, CA 91942
(619)668-3212
All results except those listed below.
- ii. 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.
- iii. 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.
- iv. 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.
- v. 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.
- vi. 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
- vii. City of San Diego - Marine Microbiology and Vector Management (EPA LabCode: CA01393, ELAP Certificate: 2185)
4918 Harbor Drive, Suite 101
San Diego, CA 92106
(619) 758-2311
Microbiology
- viii. 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
- ix. 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.
- x. Severn Trent Labs
880 Riverside Parkway
Sacramento, CA 95605
NELAP Certification: 01119CA
Telephone# (916) 373-5600
Dioxins/Furans in solids only.
- xi. Test America
2800 George Washington Way
Richland, WA 99354-1613
CA ELAP Certification: 2425
Telephone# (509) 375-3131
Gross Alpha/Beta Radioactivity
-

E. QA Report Summary

(excerpt from our Quality Assurance/Quality Control Report for Calendar Year 2007, March 28, 2008)

Overview:

The Wastewater Chemistry Services Section, Metropolitan Wastewater Department, City of San Diego performs most of the NPDES and other permit and process control chemical and physical testing for the City of San Diego E.W. Blom, Pt. Loma Wastewater Treatment Plant (PLWWTP), North City Water Reclamation Plant (NCWRP), South Bay Water Reclamation Plant (SBWRP), and the Metro Biosolids Center (MBC). We also performs the chemical/physical testing of ocean sediment and fish tissue samples for the Ocean monitoring program for the City of San Diego (PLWWTP Ocean Outfall and SBWRP Ocean Outfall) and the International Boundary and Water Commission, International Treatment Plant outfall. We also perform environmental testing for various customers, both internal to the City of San Diego and for other agencies.

The QA/QC activities of the Laboratory are comprehensive and extensive. Of the 36,252 samples received in the Laboratory in 2007, approximately 32% were Quality Control (QC) samples, such as blanks, check samples, standard reference materials, etc. 120 different analyses were performed throughout the year resulting in 268,852 analytical determinations on over 36,000 samples. Of the determinations, 110,857 (~41%) were QC determinations (e.g. blanks, lab. replicates, matrix spikes, surrogates, etc.) used to support the accuracy, precision, and performance of each analysis and batch.

We have 5 separate laboratory facility locations, each with its own California ELAP (Environmental Laboratory Accreditation Program) certification for the fields of testing required under California regulations. This is a rigorous program involving continuing independent blind performance testing, biannual comprehensive audits, and extensive documentation requirements. Each of the 5 laboratory facilities in the Metropolitan Wastewater (Metro) Department are independently certified and copies of those certifications are included at Attachment 1. California ELAP certifies fields of testing (methods/analytes) only for Water, Wastewater, and Hazardous materials for which methods are published in the Federal Register or specifically approved in regulation by U.S.EPA. Additionally, the Laboratory performs analyses using methods for which certification does not exist, such as ocean sediment and sea water determinations. Those methods have been developed in-house, derived from or in collaboration with other scientific laboratories (e.g. Scripps Institute of Oceanography, Southern California Coastal Water Research Project, et. al.) and have been used extensively in multi-agency EPA and State sponsored studies over the past several years. Many methods of analysis developed for matrices and applications not within ELAP jurisdiction have been adapted from ELAP listed methods. In all cases, we apply generally accepted standards of performance and quality control to methods.

Additionally, the operating division and all Metro Department Laboratories maintained International Standards Organization (ISO) 14001 Environmental Management Systems certification.

Contract laboratories are also required to use only approved methods for which they hold certification for, and/or are approved by the appropriate regulatory agency (e.g. SDRWQCB). Copies of their certifications have been submitted in the 2007 Annual QA Report.

Facilities & Scope:

Each of our satellite laboratories at the treatment plants maintains California Department of Health Service, Environmental Laboratory Accreditation Program (ELAP) certification in their respective Fields of Testing (FoT). Each also has its own U.S.EPA Lab Code as shown in the following table.

Laboratory Facility	Laboratory	Address	Phone	EPA Lab. Code	ELAP Cert. No.
Alvarado Laboratory	Wastewater Chemistry Laboratory	5530 Kiowa Drive, La Mesa, CA 91942	619.668.3215	CA 00380	1609
Pt. Loma satellite lab.	Pt. Loma Wastewater Chemistry Laboratory	1902 Gatchell Rd., San Diego, CA	619.221.8765	CA 01435	2474
North City Water Reclamation Plant satellite lab.	North City Wastewater Chemistry Laboratory	4949 Eastgate Mall, San Diego, CA 92121	858.824.6009	CA 01436	2477
Metro Biosolids Center satellite lab.	Metro Biosolids Center Wastewater Chemistry Laboratory	5240 Convoy Street, San Diego, CA 92111	858.614.5834	CA 01437	2478
South Bay Water Reclamation Plant satellite Lab.	South Bay Wastewater Chemistry Laboratory	2411 Dairy Mart Rd San Diego, CA 92154	619.428.7349	CA 01460	2539

The “Laboratory” means all of the laboratory facilities listed above. The information presented in this report applies to the Laboratory, including all satellite laboratories, unless specified otherwise. The Wastewater Chemistry Laboratory performs most of the NPDES and other permit and process control chemical and physical testing for the:

- E.W. Blom, Pt. Loma Wastewater Treatment Plant (PLWWTP), NPDES Permit No. R9-2002-0025, including the ocean monitoring program.
- North City Water Reclamation Plant (NCWRP), Permit No. 97-03.
- Metro Biosolids Center (MBC), no permit, but monitoring requirements contained in Permit No. R9-2002-0025.
- South Bay Water Reclamation Plant (SBWRP), NPDES Permit No. CA0109045/ Order No. 2006-067.
- Ocean monitoring program for the International Boundary and Water Commission, International Treatment Plant.
- Other environmental testing for various customers, both internal to the City of San Diego and other public agencies.

A small portion of the required monitoring testing is sub-contracted out to laboratories certified by ELAP for those analyses; specifically;

- Gross alpha- and Beta radiations are analyzed by Truesdail Labs., Inc.
- Total organic carbon (TOC) in water are analyzed by the Water Quality Laboratory, City of San Diego, Water Department.
- Copper by ICP-MS by CRG Marine Laboratories, Inc. for San Diego Convention Center monitoring during 2007.
- Dioxin and Furans in solids are analyzed by Severn Trent Labs.

The City of San Diego pays for additional QC samples (replicates, blanks, spikes) as a routine quality check on sub-contracted laboratory work. This is beyond the usual and customary practices with contract lab. work.

The Wastewater Chemistry Laboratory's main laboratory facilities and headquarters are located at the Alvarado Water Treatment Plant Site at 5530 Kiowa Dr, La Mesa, CA 91942. There are also 4 additional certified satellite laboratories located at each of the wastewater treatment plants:

Pt. Loma Wastewater Treatment Plant (PLWWTP),
North City Water Reclamation Plant (NCWRP),
Metro Biosolids Center (MBC),
South Bay Water Reclamation Plant (SBWRP).

The main laboratory at Alvarado is the main offices for the Laboratory and contains the most extensive laboratory facilities of the several laboratories. Along with a variety of process control and wet chemistry analyses, this facility also handles all of the trace metals, pesticides/organics determinations, and other analyses. The satellite laboratories are primarily dedicated to process control, wet chemistry, and other analyses directly related to the support of the operations of the co-located wastewater treatment plant.

Ocean monitoring:

While there are no recognized State certifications for laboratory analyses of marine environmental samples (e.g. seawater, sediments, various tissues, etc.), the City of San Diego has been a leader in the development and standardization of analytical methods for determinations in these areas.

Many of the methods are novel approaches developed after extensive research and development from other published work (e.g. organo-tin analyses, sediment grain size, etc.) or adaptations of existing EPA methods (e.g. SW 846 Method 8082 for PCB congeners in sediments, etc.). In all of these cases we participate in extensive inter-laboratory calibration studies. Some of the most extensive studies have involved the participation of several public, academic/research, and private laboratories under the umbrella of the Southern California Coastal Water Research Project (SCCWRP). These programs are repeated periodically as part of the Southern California Bight Regional Monitoring/Survey Project. This is a massive sampling and monitoring program participated in by all of the major Publicly Owned Treatment Works (POTWs), California Water Resource Control Boards, and research organizations.

Our laboratory is a reference (referee) laboratory for the NRCC (National Research Council of Canada) CARP-2 Certified Reference Material (CRM) for fish tissue. This was adopted as the standard reference material for QC QA for the Southern California Bight Regional Project. This sample is also used world-wide as a standard reference material. We have worked with NIST to develop a West Coast marine sediment and fish tissue standard reference material (SRM).

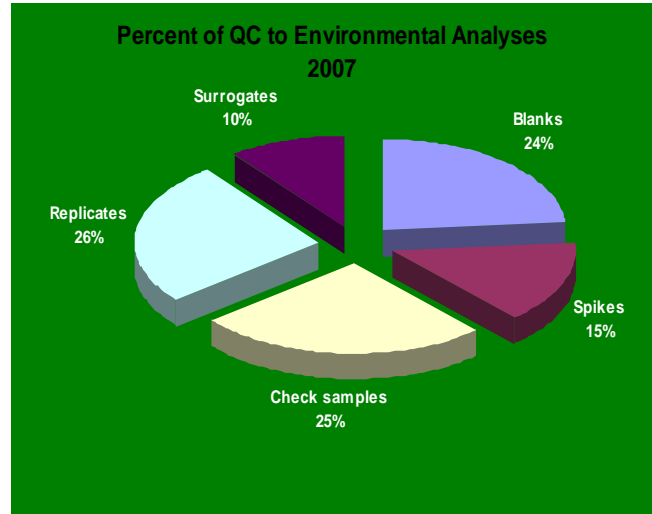
QA/QC Activities Summary:

Report for January 1, 2007 - December 31, 2007.18

The sample distribution for 2007 is not significantly changed from 2006. In 2007, 36,252 samples were received by the Laboratory during 2007 (see table A.). Of these 11,589 or 32% were Quality Control (QC) samples. Approximately 10.2% were blanks and 21.7% check or reference samples.

High levels of QC are used for laboratory determinations. Approximately 268,852 analytical determinations were made on these 36,252 samples. Of the determinations, 41 % (or 54% if calculated vs. customer samples only) were QC (e.g. blanks, lab. replicates, matrix spikes, surrogates, etc.).

A certain number (4.68% of total analyses and 0.2% of batches) of analyses fail internal QA review due to a variety of criteria, e.g. unsuccessful calibration, unacceptable QC performance, etc. Table C. list which analyses and the number of batches that were rejected outright. The analysis is then repeated, or, if that is not possible, the data is either not reported or reported but flagged as having not met data quality objectives and may not be suitable for compliance determination.



	<u>2007</u>	
	<u>Number of Samples</u>	<u>Percent of total samples</u>
Table A. Samples		
<u>Customer/Environmental samples</u>	<u>24,663</u>	<u>68.03%</u>
<u>Quality Control (QC) samples</u>	<u>11,589</u>	<u>31.97%</u>
<u>Total Samples</u>	<u>36,252</u>	<u>100.00%</u>
QC Samples:		
Blanks:		
<u>FIELD BLANK</u>	<u>110</u>	<u>0.30%</u>
<u>REAGENT BLANK</u>	<u>9</u>	<u>0.02%</u>
<u>TRIP BLANK</u>	<u>5</u>	<u>0.01%</u>
<u>METHOD BLANK</u>	<u>3,593</u>	<u>9.91%</u>
<u>Total Blanks:</u>	<u>3,717</u>	<u>10.25%</u>
Check samples:		
<u>External Check samples</u>	<u>4,496</u>	<u>12.40%</u>
<u>Internal Check samples</u>	<u>3,363</u>	<u>9.28%</u>
<u>SRMs (Standard Reference Material)</u>	<u>13</u>	<u>0.04%</u>
<u>Total Check Samples:</u>	<u>7,872</u>	<u>21.71%</u>
<u>Total QC Samples:</u>	<u>11,589</u>	<u>31.97%</u>

18 Data counts (metrics) were obtained on March 24, 2008 and do not include analyses that were underway, but incomplete as of that time. All table data is based on samples collected between January 1, 2007 and December 31, 2007. This data summary is comprehensive; includes all laboratory analyses work for all customers, projects, and programs unless otherwise indicated.

NOTE: Analysis, for the purposes of the metrics used in this report generally refer to each analyte determined in each sample in a batch. For example, an analysis(determination) of several metals in a sample (e.g. iron, nickel, lead) would total as 3 analyses in the expression of totals such as those in Table A.2. in the following. This method of calculation has been used for many years and, with batch and method, is useful comparative measure of laboratory performance and is one of the fundamental constants in applying quality control measures.

Table A.2. Analyses (results) and Batches - 2007			
	Number	Percent of total	
Total number of analytes/results determined (by sample date): ¹	268,852	NA	
Total results not complete ⁵ :	7,975	3.0%	
No. of results for Customer/ Environmental Samples¹:			
	205,454	76.4%	
Total number of rejected results:	12,157	4.68%	
		4	5
No. of results for blanks:	26,153	9.7%	12.7%
No. of results for matrix spikes:	16,341	6.1%	8.0%
No. of results for Check samples:	28,511	10.6%	13.9%
No. of results for Replicates:	28,514	10.6%	13.9%
No. of results for surrogates:	11,338	4.2%	5.5%
Total QC analyses run : ²	110,857	41.2%	54.0%
Total in-house analyses completed ³:	260,028	100.0%	
Results from sub-contracted labs.			
Truesdail Laboratories/Test America	56	0.02%	
CRG Marine Laboratories	224	0.09%	
Water Quality, City of San Diego	23	0.01%	
Severn Trent Laboratories, Inc	433	0.17%	
Total outside results:	736	0.28%	

¹ Total Customer/Environmental Samples is used as denominator in calculating percentages. control_type of SAMPLE.

² matrix spikes, replicates, surrogates are also part of the total for Customer/Environmental samples; are special aliquots or handling for Quality Control purposes.

³ - as of March 24, 2008.

⁴ percent of QC samples calculated from grand total (268,852 analyses).

⁵ - percent of QC samples calculated from actual environmental samples (205,454).

	No. of Batches	Percent of total
Total number of analytical batches:	13,938	
Total number of rejected analytical batches:	28	0.20%
Incomplete batches (as of Mar 24, '08):	133	0.95%

Outside laboratories

A small number of permit required analyses are sub-contracted out, including gross alpha- & Beta-radiation, and Total Organic Carbon in wastewater as summarized below. Additionally, a special analysis for copper by ICP-MS is done by an outside laboratory with specialized instrumentation.

Outside Laboratory		Number of analyses
	Copper by ICP-MS for SD Convention	
CRG Marine Labs.	Center	224
Severn Trent Labs	gross alpha- and Beta-radiations , Dioxins	433
Truesdail Labs	gross alpha- and Beta-radiations	56
City of San Diego Water Quality Lab.	Total Organic Carbon	23
	total:	736

QA Plan:

A copy of our Laboratory's current Quality Assurance Plan was included in the 2007 Annual QA Report submitted in March 2008. No significant changes were made in 2007.

Performance Testing (PT) Studies for 2007:

The Wastewater Chemistry Laboratory participates in required ELAP and U.S.EPA PT studies throughout the year. We participated in 13 PT studies throughout the year, including the Annual NPDES DMR-QA study. Our individual laboratory facilities participated individually (as required by ELAP). All PT studies were purchased from ERA and were successfully completed with satisfactory results for all analytes by in-house chemistry laboratories.

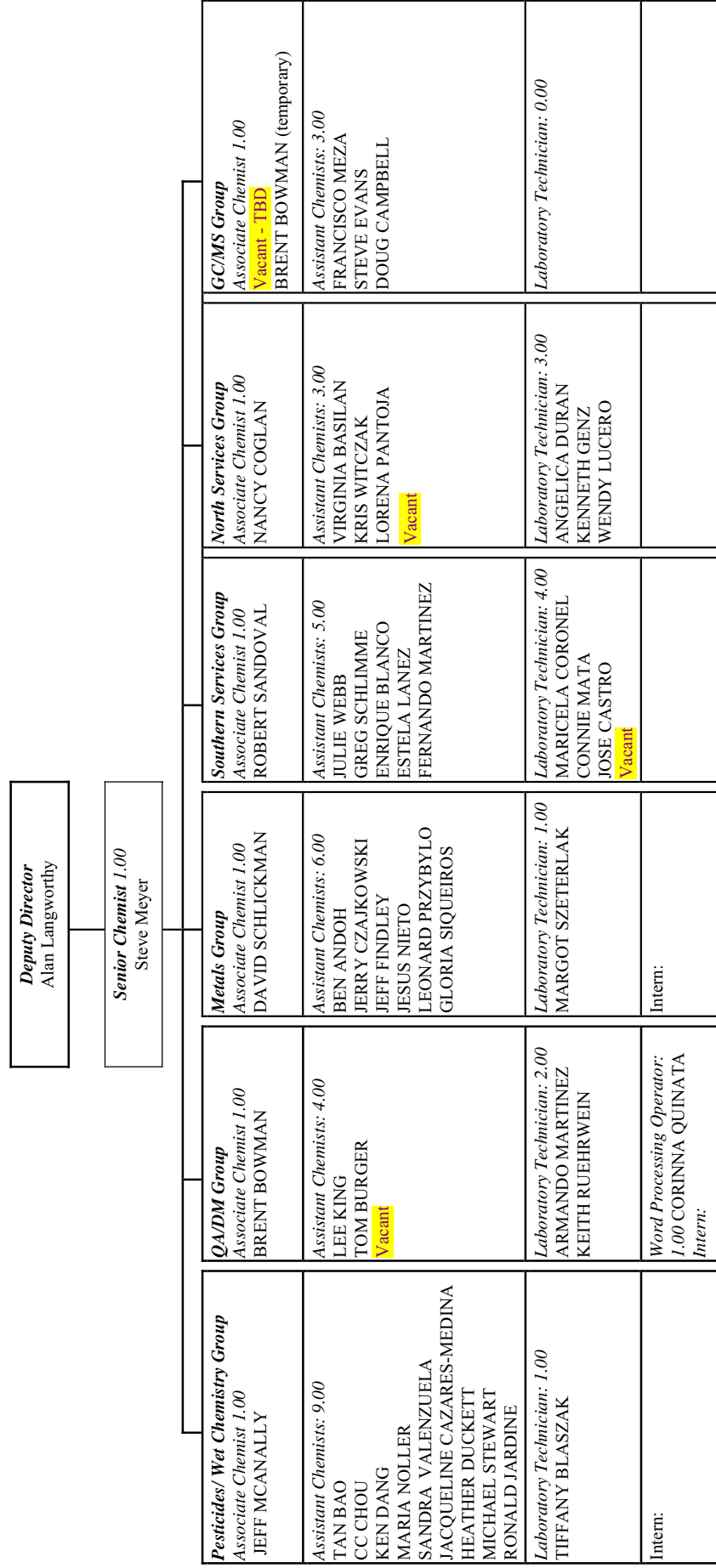
F. Staff contributing to this Report

I. Staff Contributing to this Report.

Initials	ID	First Name	Last Name	Signature
BOA BOA	BOA	Ben	Andoh	Benjamin Andoh
TB TB	TSB	Tan	Bao	Tan Bao
VB VB	VFB	Virginia	Basilan	Virginia Basilan
EB EB	BTX	Enrique	Blanco	Enrique Blanco
Tblaszk TB	BEV	Tiffany	Blaszak	Tiffany Blaszak
BGB BGB	N8B	Brent	Bowman	Brent Bowman
TB TB	TMB	Tom	Burger	Tom Burger
DC DC	DVC	Doug	Campbell	Doug Campbell
LC	UEC	Laura	Carr	Laura Carr
JC JC	G3C	Jose	Castro	Jose Castro
JCM JCM	U8C	Jacqueline	Cazares-Medina	M. Jacqueline Cazares Medina
CC CC	I5C	CC	Chou	CC Chou
NC NC	NLC	Nancy	Coglan	Nancy Coglan
MC MC	M5C	Maricela	Coronel	Maricela Coronel
JCM	G8C	Jerry	Czajkowski	Jerry Czajkowski
KD KD	KOD	Ken	Dang	Ken Dang
HHD HD	HZD	Heather	Duckett	Heather Duckett
ACD AD	AD4	Angelica	Duran	Angelica Duran
SE SE	SZE	Steve	Evans	Steve Evans
JTF JTF	JRF	Jeff	Findley	Jeff Findley
KG KG	KG3	Kenneth	Genz	Kenneth Genz
RJ RJ	RCJ	Ron	Jardine	Ron Jardine
LK LK	LNK	Lee	King	Lee King
EL	EVL	Estela	Lanez	Estela Lanez
WLucero WL	WL7	Wendy	Lucero	Wendy Lucero
AM AM	M5U	Armando	Martinez	Armando Martinez
FM	YBM	Fernando	Martinez	Fernando Martinez
ConnieM CM	M4M	Connie	Mata	Connie Mata
SWM SWM	SWM	Steve	Meyer	Steve Meyer
FML FML	IZM	Francisco	Meza	Francisco Meza
JM JM	G7M	Jeff	McAnally	Jeff McAnally
JN JN	IEN	Jesus	Nieto	Jesus Nieto
MN MN	MGZ	Maria	Noller	Maria Noller
LP LP	LJP	Lorena	Pantoja	Lorena Pantoja
LP LP	LXP	Leonard	Przybylo	Leonard Przybylo
CAQ CAQ	CQ5	Corinna	Quinata	Corinna Quintana
KRuehrwein KR	KRV	Keith	Ruehrwein	Keith Ruehrwein
RS RS	NDS	Robert	Sandoval	Robert Sandoval
DWS DWS	DXS	David	Schlickman	David Schlickman
GS GS	GTS	Greg	Schlimme	Greg Schlimme
GS GS	HIR	Gloria	Siqueiros	Gloria Siqueiros
MRS MRS	MWS	Michael	Stewart	Michael Stewart
MIS MIS	S49	Margot	Szeterlak	Margot Szeterlak
SV SV	SCV	Sandra	Valenzuela	Sandra Valenzuela
JW JW	AIW	Julie	Webb	Julie Webb
KLW KLW	KLW	Kristof	Witczak	Kristof Witczak

Figure 1. Chemistry Laboratory Organization Chart. (2007)

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

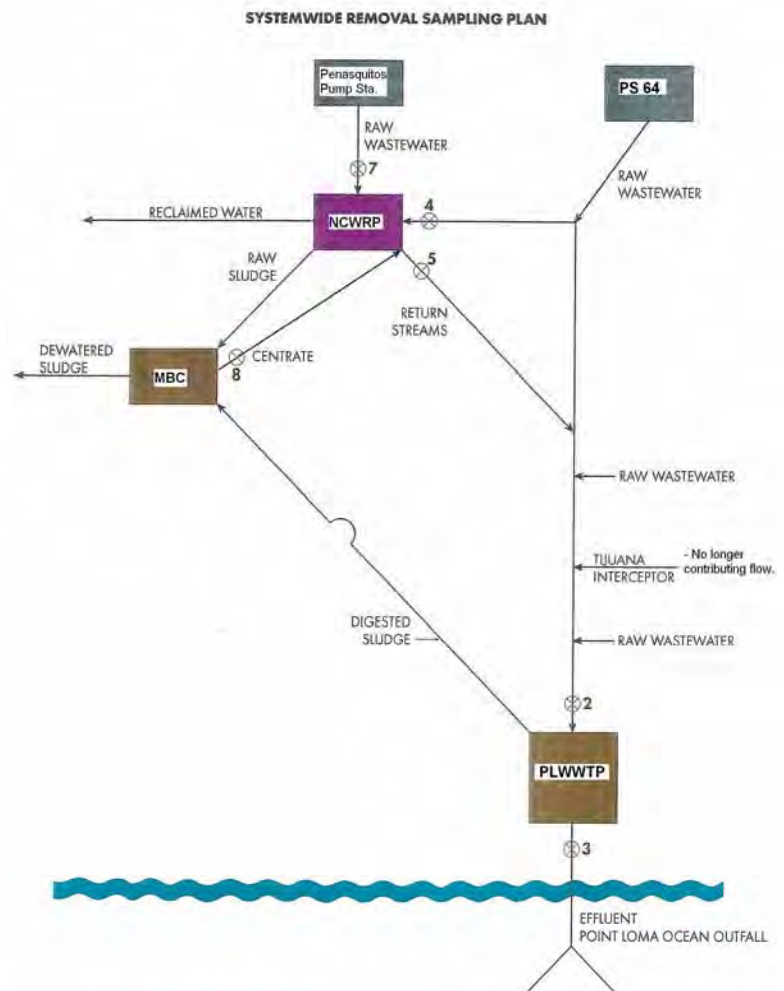


G. System-wide calculation definition

System-wide removals are a practical extension of the “Adjusted Removals” previously reported.

Adjusted removals were used to determine removal efficiency of TSS and BOD, during the period when biosolids dewatering occurred at Fiesta Island. The wastewater removed by dewatering (e.g. belt filter press or drying bed decant) was returned to the Point Loma WWTP headworks and contained a certain amount of solids. In order to account for the removal and return of TSS and BOD, on a complete mass-balance basis, the Adjusted Removals were determined. That calculation was relatively straight forward and included removing the contribution to the Pt. Loma WWTP influent of the returned stream. The calculation was done on a mass balance basis to fully account for the solids and BOD contributions returned back to the system.

With the replacement of Fiesta Island biosolids processing by the Metro Biosolids Center (MBC) and the addition of the NCWRP (North City Water Reclamation Plant) in the Metro System, the removal and return of solids to Pt. Loma WWTP was complicated by the addition of multiple inputs and outputs to the system. To calculate the system-wide removals, the net total inputs and outputs were determined and included in the updated calculation¹⁹. The determination of System-wide removals is represented by Equation 1 on the next page. This simplified diagram graphically shows the relationships of the input and output streams. The Tijuana interceptor (emergency connection) has not contributed flows since September 2003. The South Bay Water Reclamation Plant (SBWRP) is not shown since it currently has no net contribution or solids removal.



¹⁹ Calculations are performed by a computer database application working with Metro System flow and concentration data.

Equation 1.

System-wide %Removal= $\frac{(\sum \text{System Influent}) - (\sum \text{Return Streams}) - (\sum \text{Outfall Discharge})}{\sum \text{System Influent}}$ x 100%

$\sum \text{System Influent} - \sum \text{Return Streams}$

Where,

System Influent = Point Loma Wastewater Treatment Plant Influent,
NCWRP Influent Pump Station (i.e. Pump station 64),
NCWRP Influent from Penasquitos Pump Station

Return Streams = NCWRP Filter Backwash,
NCWRP Plant Drain,
NCWRP Secondary Effluent,
NCWRP Un-disinfected Filtered Effluent Bypass,
NCWRP Final Effluent
Metro Biosolids Center Centrate

The TSS and BOD₅ concentrations, together with the flow rate, of each stream are measured daily and mass emissions (pounds a day) for each stream determined. The above formula is applied on the resultant mass balances and the system-wide removals calculated for each day. In the event that a data value (e.g. flow rate measurement, TSS concentration or BOD₅ concentration) is not available for a stream, the median value for the previous calendar year for that stream is used as a surrogate number to allow completion of the calculation. The annual averages and summaries in the system-wide data tables are derived (arithmetic mean) from the monthly averages of the daily calculated mass emissions values and removal rates.

H. Annual Flow Calibration Report

The firm of MWH completed the annual Gould Flow Metering System Certification in March 2007.

A copy of their findings, without appendices, follows.

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