Credits and Acknowledgements

Point Loma Wastewater Treatment Plant and Ocean Outfall Annual Monitoring Report 2007

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I. Introduction

A. Executive Summary

Purpose:

This report meets the annual reporting requirements as specified in San Diego Regional Water Quality Control Board, Order No. R-2002-0025[1] (NPDES Permit No. CA0107409) for the E. W. Blom Point Loma Wastewater Treatment Plant (PLWWTP). It also serves as a comprehensive historical record and reference of operational and compliance metrics of value to the public, policy makers, and technical reviewers.

Background:

The Point Loma Wastewater Treatment Plant is located at 1902 Gatchell Road, San Diego, California and is the main treatment facility in the Metropolitan Wastewater System. Located on a 40-acre site at the western end of Point Loma, the plant went into operation in 1963 to serve the growing needs of the region. The plant serves approximately 2.2 million customers and treats approximately 172 million gallons (5-year average) of wastewater per day with a maximum capacity of 240 million gallons per day (mgd). In 1993, the outfall was extended from a length of two miles to its present length of 4.5 miles off the coast of Point Loma. The 12-foot diameter outfall pipe terminates in approximately 320 feet under the Pacific in a Y-shaped diffuser structure to ensure dispersal of effluent. The Advanced Primary[2] Treatment system includes chemically enhanced primary sedimentation and anaerobic biosolids processing. For a detailed discussion of the plant and treatment process see subsection D. and section III. Plant Operations Summary.

Major changes:

- **Flows down** – The average daily flow of 161 million gallons per day (mgd) is down from the 170 mgd in 2006 and the 5-year average of 172 mgd in large part due to increased recycling, drought and conservation, and other factors.
- **TSS Removals[3] up** – 2007's 90% removals are an improvement from the previous year's 88%.
- **BOD Removals up** – to 70% from last year's 65%.
- **Mass emissions down** – the mass emissions of solids was down again this year, to 45,822 pounds/day from 49,806 in 2006.

[1] This is a Clean Water Act section 301(h) modified permit (Clean Water Act), as modified by the Ocean Pollution Reduction Act of 1994 (OPRA).

[2] Sometimes called Chemically Enhanced Primary Treatment (CEPT).

[3] System-wide removals.

Other Key metrics for 2007	Annual Daily Average	Annual Total (million gals.)
Effluent Flow (mgd)	161.4	58,906

Parameter	Annual Daily Average (mg/L)	System-wide Removal (%)	Plant Removal (%)	Annual Mass Emission (metric tons)
TSS[4]	34	89.7	89.1	7,577
BOD[5]	95	70.3	68.4	21,172

Compliance:
The major permit discharge limitations including flows, TSS and BOD removals and mass emissions rates, were well within discharge requirements. The required monitoring program creates over 15,000 opportunities to miss a compliance point as well as several dozen annual Mass Emissions Benchmarks applicable to the discharge from the PLWWTP. Two of those exceeded permit discharge limits in 2007. On 2-days in 2007, grab samples of the treated effluent exceeded the Instantaneous Maximum limit of 3.0 mL/L for Settleable Solids.

Date/time	Settleable Solids (mL/L)
November 1, 2007/ 1112	4.8
December 31, 2007/ 1042	6.3
-do-- / 1305	0.2 (Within limits)
Instantaneous Maximum Limit (mL/L) = 3.0 mL/L	

A more detailed discussion is in Section E. of this chapter.

[4] Total Suspended Solids) mg/L, i.e. parts per million
[5] Biochemical Oxygen Demand) mg/L

B. Explanatory Notes

The purpose of this document is to both meet the requirements of Monitoring and Reporting Program (MRP) No. R-2002-0025, NPDES Permit No. CA0107409, and to provide a reference source and resource tools for both regulatory agencies and City staff and their consultants. To this end the past year's data is presented in tabular and graphical form. Monitoring results only reported annually are presented, as well as the special items and discussions itemized in Order No. R-2002-0025.

This document is comprehensive, including 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 6-year tables have been updated to include 2002 through 2007 data.

Note that, for averaging purposes, "less than" and "not detected" (nd) values were treated as zero. 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 "ND" or not detected.

			Organophosphorus Pesticides					
			PLE	PLE	PLE	PLR	PLR	PLR
			10-MAR-1998	27-APR-1998	10-SEP-1998	10-MAR-1998	27-APR-1998	10-SEP-1998
	MDL	Units	0311980006	0428980006	9809107494	0311980007	0428980007	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 is that statistical confidence in the results of an analysis is heavily dependent upon the concentration relative to the Method Detection Limit (MDL). Essentially all of 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, an "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

Variation in summary data in tables

Very small differences may occur (<0.1%), between tables for annual or monthly averages, totals, and other[6] statistical summary data due to rounding differences or how

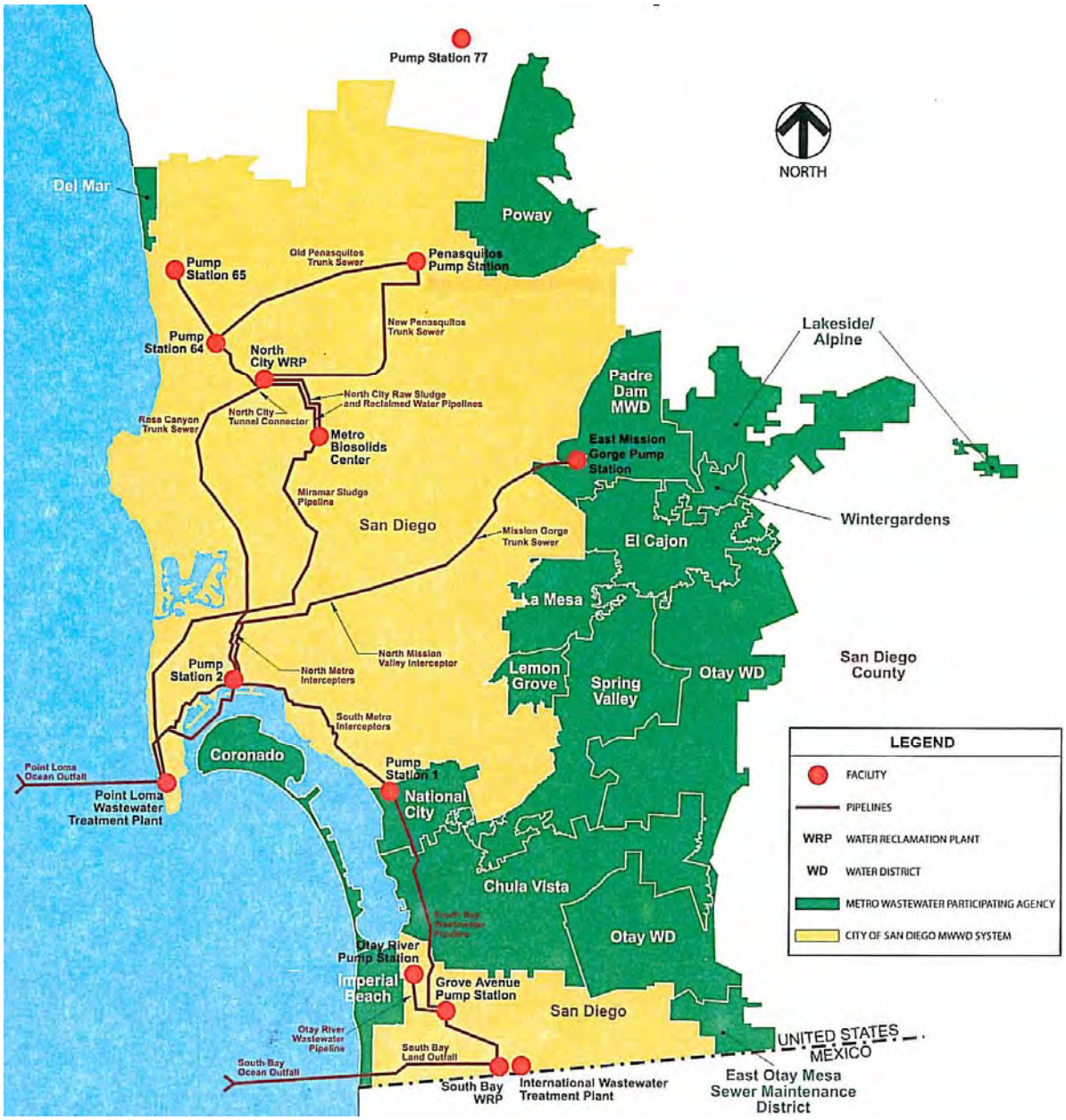
[6] e.g. mass emissions, percent removals, etc.

the underlying data is treated. For example, the computerized report programs may perform summary calculations using daily values (even though only monthly values display on the table) or monthly averages. There will be small rounding variation between the two approaches.

Typically, mass emissions are calculated in the monthly summary tables are calculated from the monthly averages shown in the table. In these tables, raw data is rounded one significant figure on the intermediate result. A calculation rounding only after the final result will generally be slightly different in the last significant figure. Additionally, statistical summary data of calculated values (e.g. mass emissions, dry tons, etc.) may be calculated from monthly averages or using the annual average data. This also may introduce variation that is statistically insignificant.

C. Overview of Metro System

The Metropolitan Sewerage System serves the Greater San Diego population of 2.2 million from 16 cities and districts generating approximately 170 million gallons of wastewater per day. Planned improvements will increase wastewater treatment capacity to serve an estimated population of 2.9 million through the year 2050. Nearly 340 million gallons of wastewater will be generated each day by that year. The Metropolitan Wastewater Department treats the wastewater generated in a 450-square-mile area stretching from Del Mar and Poway to the north, Alpine and Lakeside to the east, and south to the Mexican border. In addition, wastewater collection services are provided to the City of San Diego.



ISO 14001 Certification

Wastewater Treatment and Disposal Division (formerly called Operations and Maintenance Division) and the Monitoring and Reporting Programs operated by the Environmental Monitoring and Technical Services Division has been certified in ISO[7] 14001, Environmental Management Systems.

[7] International Organization for Standardization.

D. Overview of Point Loma Wastewater Treatment Plant

The Point Loma Wastewater Treatment Plant (PLWTP) is the main treatment facility in the Metropolitan Wastewater System. Located on a 40-acre site at the western end of Point Loma, the plant went into operation in 1963 to serve the needs of the region.

It functions today as an Advanced Primary Treatment plant and processes approximately 168 million gallons of sewage per day generated by about 2.2 million users. Plant capacity is 240 million gallons per day. In 1993, the outfall was extended from a length of two miles off the coast of Point Loma to its present length of 4.5 miles. The 12-foot diameter outfall pipe terminates in approximately 320 feet of water in a Y-shaped diffuser structure to ensure dispersal of effluent.

Removed solids are anaerobically digested on site. The digestion process yields two products: methane gas and digested biosolids. The methane gas is utilized onsite to fuel electrical generators that produce enough power to make the PLWTP energy self-sufficient. Additional co-generation of electrical power comes from on-site hydroelectric generator utilizing the millions of gallons of daily effluent flow and the energy in the approximately 90-foot drop from the plant to outfall. The plant sells the excess energy it produces to the local electricity grid, offsetting the energy costs at pump stations throughout the service area. The biosolids are conveyed, via a 17-mile pipeline, to the Metro Biosolids Center for dewatering and beneficial use (e.g. soil amendments and landfill cover) or disposal.

The Point Loma Wastewater Treatment Plant recently received its ninth Gold Award from the Association of Metropolitan Sewerage Agencies for its ninth year of complete compliance with all Federal and State regulations.

E. Discussion of Compliance Record

The major permit discharge limitations including flows, TSS and BOD removals and mass emissions rates, were well within discharge requirements. Given the number and frequency of monitored parameters, there are over 15,000 opportunities to miss a compliance point as well as several dozen mass emissions benchmarks applicable to the discharge from the PLWWTP. All permit limits and benchmarks are shown for reference in Chapter 2, Influent and Effluent Data, of this report.

On 2 of 366 days in 2007, grab samples of the treated effluent exceeded the Instantaneous Maximum limit of 3.0 mL/L for Settleable Solids. In both cases the next sample showed return to normal ranges and were well below discharge limits. The weekly and monthly discharge limits contemporary with these days were also in compliance with discharge limitations.

Month	Events outside of permit limits[8].	Comments: (see monthly reports for further details)
January	None	
February	None	
March	None	
April	None	
May	None	
June	None	
July	None	Problems with the sampling equipment at the Metro Biosolids Centrate Return Stream, lead to anomalous data from the determinations of solids and BOD on July 3,4 and 5th. While no compliance issues per se arose, calculating system-wide removals utilized 2006 averages in lieu of the anomalous data as stipulated in the permit.
August	None	
September	None	
October	None	
November	1	The settleable solids of the effluent grab sample taken at 11:12 am on November 1, 2007 was 4.8 mL/L and exceeded the instantaneous maximum limit of 3.0 mL/L. This high settleable solids value is attributed to the ferric chloride feed being interrupted due to a maintenance power outage at MCC20 to replace a breaker.
December	1	The settleable solids of the effluent grab sample taken at 10:42 am on December 31, 2007 was 6.3 mL/L and exceeded the instantaneous maximum limit of 3.0 mL/L. A second grab sample was taken at 13:05 pm, approximately 2.5 hours after the first. The settleable solid of this second sample was below the limit with a value of 0.2. The high settleable solids value is likely a transient.
Total:	**2**	

[8] Number of measures that exceeded discharge limits.

Annual Limits:

Chemical and Physical Parameters

The Pt. Loma Wastewater Treatment Plant met the two key discharge limits based on annual performance, including BOD (Biochemical Oxygen Demand) annual average removal and TSS (Total Suspended Solids) mass emissions.

Annual Requirement	**2007 Annual Average System-wide Removal** (%)	Plant Removal (%)
BOD - met the required ≥58% BOD removal on both the system-wide (required) and plant-only basis.	70.3	68.4
	2007 Annual Mass Emission (metric tons)	
TSS - Mass emission of TSS shall be no greater than 13,599 mt/yr.	7,577	

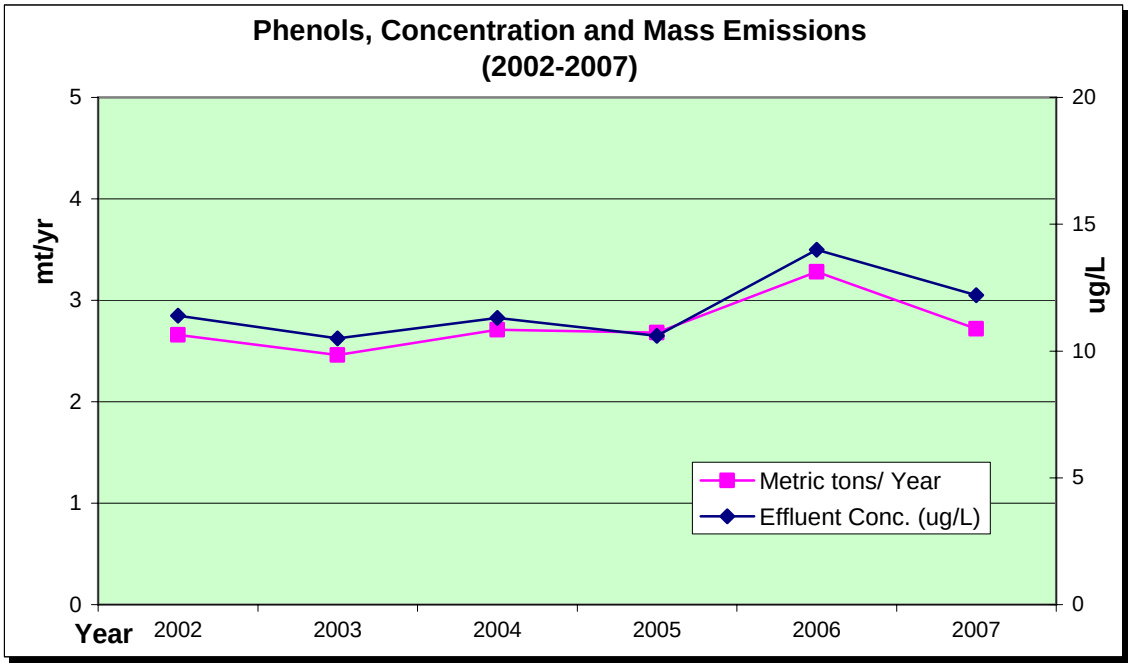
Other chemical parameters, microbiology, and toxicity.

Note: Permit limits are detailed in Section 1 of this report and effluent data is presented in summary tables in section 2 of this report.

Mass Emissions Benchmarks:

All Mass Emissions Benchmarks were met with the continued exception of non-chlorinated phenols.

The Benchmark Mass Emissions Rate (MER) of 2.72 metric tons/year, for non-chlorinated phenols[9] was slightly higher than the bench mark of 2.57 metric tons/year and lower than last year's 3.28-metric tons. This was based on an average concentration of 12.2-ug/L, which represents approximately 16-pounds per day.



The multi-year trend in phenol concentrations was up in 2006, and returned to 5-year norms in 2007. The plant removes 29% of the phenol on average.

Tijuana Interceptor Closure Summary

The Tijuana Interceptor (emergency connection) continues to be a non-factor in the operation of the Metropolitan (Metro) Wastewater System and Pt. Loma WWTP operations. We received no flows from the connector during the year. There is no monitoring data to report and the previously included section for it in the annual reports has been discontinued.

According to the International Boundary Water Commission's staff reports and our flow meter section's data, there was no flow of wastewater through the Tijuana Interceptor for 2007. Historically, the flows for the Tijuana Interceptor have included the flow meter readings from the TJ1 and IBWC02 meters. The IBWC02 meter measured all flows through the interceptor and included only sewage flows to the Metro system from Mexico. As of December 1st, 2000 the IBWC02 meter was disconnected by the International Boundary Water Commission and there is no intent for re-establishing it. No data from this meter was submitted in 2007. IBWC staff repeatedly stated that it is their intention that no Tijuana wastewater or International

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[9] All found was as phenol itself.

Treatment Plant effluent will be discharged into the interceptor. IBWC staff reported that the Emergency connection was not open during 2007.

No flow data was recorded from September 24, 2003 to September 1, 2006. Beginning in September of 2006 flow data was recorded at both the TJ1 and the upstream CW1 metering sites. The CW1 meter records flows entering the Metro system from the community of San Ysidro. The flow data at both meters are comparable in magnitude and for 2007 the CW1 flow is considered to be the sole contributor to the downstream TJ1 flow. The nominal positive deviation between these two sites is likely a result of slight differences in flow meter accuracy, independently these meters are considered accurate to +/-10%, and intrusion between the metering sites. No samples were taken the entire year of 2007.

F. Plant Facility Operation Report

POINT LOMA 2007 ANNUAL FACILITY REPORT
prepared under the direction of Plant Superintendent K.C. Shankles.

The facility report addresses Process Control concerns and considerations and summarizes Plant Operations, & Engineering activities.

PROCESS CONTROL: FACTORS IMPACTING PLANT PERFORMANCE 2007

The following information is being reported in an effort to identify some of the factors, operational and otherwise, that may have impacted plant performance during 2007. Much of the information contained herein is based on assumptions regarding plant performance for this period. The main point of this effort is to continue identifying possible factors influencing plant performance which in turn will help to more effectively operate this facility. The information is presented in chronological order when possible. Please note that the numerical values used here are largely based on analysis performed by Plant staff at the Process Laboratory and have not always been validated for official reporting purposes.

Areas that will be covered include: sludge blanket levels in the sedimentation basins and raw sludge pumping volumes, coagulation chemical application, influent temperature and seasonal impacts, and plant performance related to unknown variables.

SLUDGE BLANKET LEVELS AND RAW SLUDGE PUMPING VOLUMES

In most circumstances it is assumed that maintaining lower sludge blanket levels in sedimentation basins and increased raw sludge pumping will produce a plant effluent with a lower total suspended solids (TSS) concentration. Review of data, for daily average sludge blanket levels and daily average total raw sludge pumped, shows that the averages for the six years were too close to draw any conclusions about the validity of the above assumption.

The average effluent TSS concentration was calculated for 2002, 2003, 2004, 2005, 2006 and 2007. This average was then compared to the average sludge blanket level, for all basins in operation, and the average daily raw sludge pumping volume for this same period. The information below reflects the data gathered for this comparison.

For The Period from January 1 through December 31			
Year	Effluent TSS Average Concentration (mg/L)	Average Daily Sludge Blanket Level (inches)	Average Daily Raw Sludge Volume (mgd)
2002	43.5	153.5	1.14
2003	42.0	158.0	1.15
2004	42.6	168.0	1.09
2005	40.7	159.0	1.11
2006	34.9	161.0	0.99
2007	**33.9**	**166.0**	**0.95**

COAGULATION CHEMICAL APPLICATION

Data for ferric chloride and anionic polymer doses was reviewed to determine the impact that rates of product application have on plant performance. The average daily dose for each chemical was calculated for the same time period as above and compared to the TSS and BOD concentrations and removal rates.

For The Period from January 1 through December 31						
Year	Ferric Chloride	Polymer	Average Effluent TSS Concentration	Average Effluent TSS Removal Rate	Average Effluent BOD Concentration	Average Effluent BOD Removal Rate
	Average Daily Dose					
2002	25.8 mg/L	0.15 mg/L	43.5 mg/L	84.9%	93.8 mg/L	64.7%
2003	29.9 mg/L	0.18 mg/L	42.0 mg/L	85.1%	105.0 mg/L	61.3%
2004	29.7 mg/L	0.17 mg/L	42.6 mg/L	85.2%	101.8 mg/L	60.2%
2005	26.5 mg/L	0.17 mg/L	40.7 mg/L	85.1%	104.5 mg/L	58.4%
2006	24.0 mg/L	0.14 mg/L	34.9 mg/L	87.7%	101.8 mg/L	62.3%
2007	**24.0 mg/L**	**0.14 mg/L**	**33.9 mg/L**	**89.1%**	**95.3 mg/L**	**68.4%**

A reduction of TSS and BOD concentrations occurred in the effluent in 2007, when compared to the 2006 values. These lower values resulted in improved Removal rates for the year

INFLUENT TEMPERATURE AND SEASONAL IMPACTS

Influent temperature variations at the Point Loma Facility are usually minimal throughout the year. The temperature of the influent flow, for 2007, ranged from 70.7 to 84.7 degrees Fahrenheit (°F). Typically, the influent temperature changes are very subtle as each season progresses. The most pronounced changes in this parameter occur during the winter, after the rainy season begins and during the summer, after periods of sustained warm weather. Temperature changes, related to rain storms, were normal in 2007. The effect of these temperature changes is difficult to judge due to the number of variables affected by the rainfall. The average daily influent temperature was calculated for the same period of time seen previously in this report, and the results are recorded below.

For The Period from January 1 through December 31	
Year	**Average Daily Influent Temperature (°F)**
2002	75.3
2003	75.9
2004	76.7
2005	76.8
2006	77.0
2007	**77.0**

PLANT PERFORMANCE RELATED TO UNKNOWN VARIABLES

BOD and TSS removal rates in 2007 improved when compared to the removal rates of 2006. This is due to Pump Station 2 dosing Ferric Chloride throughout the entire year.

Turbidity testing, at the sedimentation basin effluents, continued in 2007 on a regular basis. This has continued to help identify basins where mechanical or other problems are occurring. Analysis of 24 hour discrete effluent samples, for TSS concentration, has continued on an as-needed basis and is providing data on diurnal variations in plant performance. Data from this analytical work has been and will be used to help develop more effective chemical dosing strategies in the plant.

SPECIAL PROJECTS

The City of San Diego has been evaluating reducing the amount of solids discharged at the PLWTP. The target would be to meet the secondary limits specific to TSS.

The City performed a review of the available technologies to accomplish the removal of TSS from the Chemically Enhanced Primary Treatment (CEPT) generated at the PLWTP. The review culminated in identifying the Fuzzy Filter, manufactured by Schreiber, as the front running and possibly the only option.

A pilot study of the Fuzzy Filter was conducted 09/18/2007 to 10/05/2007. The purpose was to determine if the Fuzzy Filter would be a viable filter at the effluent end of the sedimentation basins to lower the effluent TSS to below 30 mg/L on a consistent basis.

CONCLUSIONS

Plant performance in the year of 2007 exceeded all NPDES Permit requirements except as noted in Section E of this report.

ENGINEERING REPORT 2007

The following projects were in construction at the Point Loma Wastewater facility during 2007:

Grit Aeration System Project

This project will replace the existing leaking grit air piping and the existing grit air blowers. The new piping is 316stainless steel and there are three new blowers. There is a new enclosure for the blowers. This project was awarded in September 2006 and was completed in September 2007. The estimated cost for this work is $1,257,000.

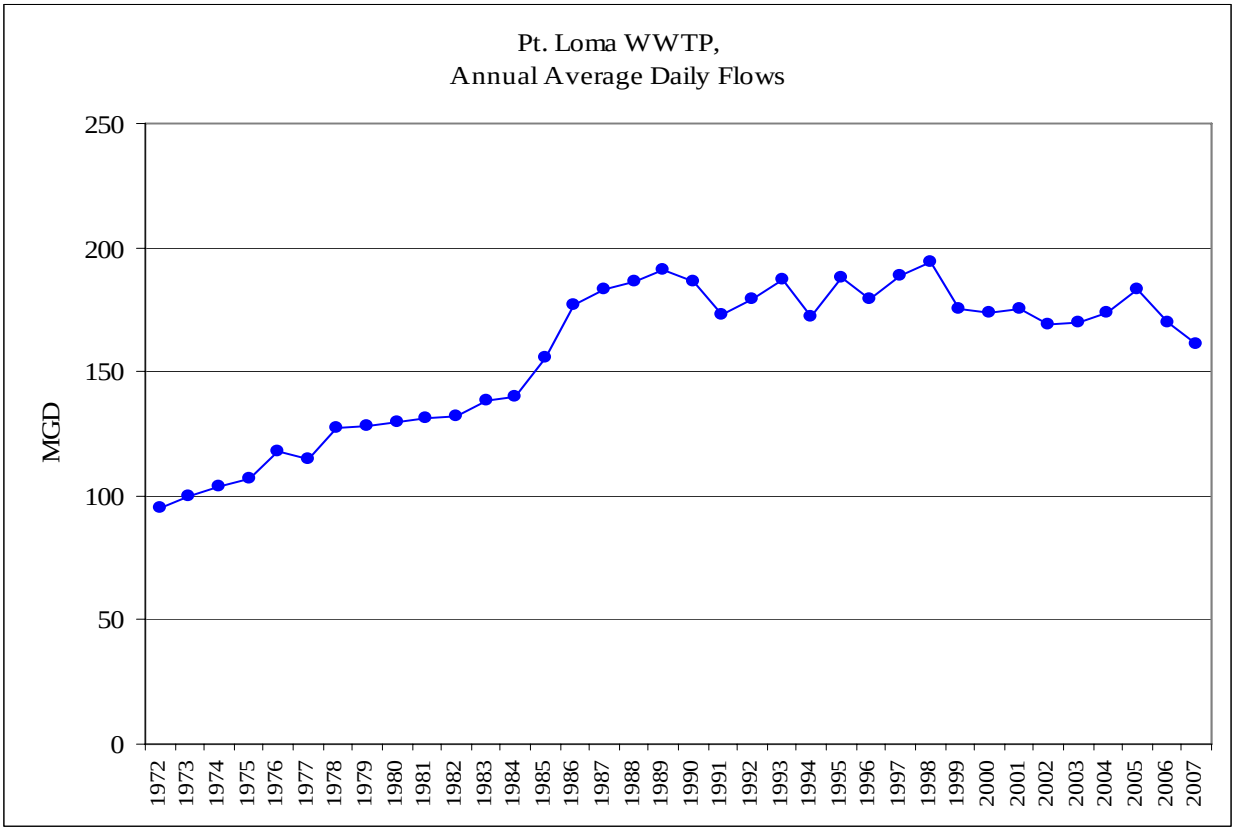
G. Correlation of Results to Plant Conditions

Major changes:

- **Flows down** – The average daily flow of 161 million gallons per day (mgd) is down from the 170 mgd in 2006 and the 5-year average of 172 mgd in large part due to increased treatment at the South Bay Water Reclamation Plant, drought and conservation, changes in industrial use, and other factors.
- **TSS Removals[10] up** – 2007's 90% removals are an improvement from the previous year's 88%.
- **BOD Removals up** – to 70% from last year's 65%.
- **Mass emissions down** – the mass emissions of solids was down again this year, to 45,822 pounds/day from 49,806 of 2006.

Flow

The 2007 daily average influent flow to the Point Loma WWTP was 161 MGD. This is down from 170 MGD in 2006.



The data shows a continued reduction in the flows vs. what would have been predicted from 1970's and 80's steady increases. It appears that the drought-induced reductions in flows from water conservation efforts, have become permanent. In the past 18-years, there is no discernable increase in flows on a sustained basis. In fact, since 1987 the

[10] System-wide removals.

regression line would show a slight decrease in flow rates. The significant correlation between rainfall and flow rates (below graph) seems to dominate the changes in flows from year-to-year.

Water Recycling and Beneficial Reuse

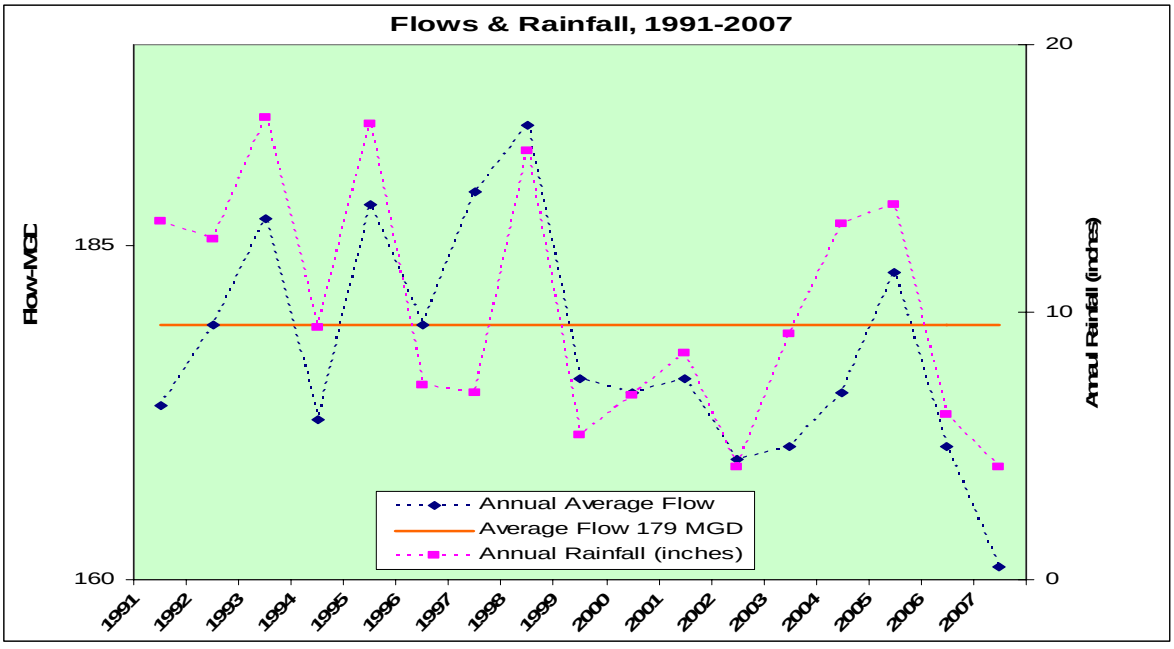
SBWRP (South Bay Water Reclamation Plant) Effect:

In 2007 the amount of system flows treated at the SBWRP increased by nearly 41%, or an average of over 8 million gallons per day taken from the Metro system thus decreasing influent to the PLWWTP. The first full year of reclamation efforts at SBWRP dramatically increased treatment volumes and accounts for the bulk of the nearly 9 MGD decrease in average daily flow at Pt. Loma in 2007 compared to 2006. The net reduction is the result of the SBWRP treatment and distribution of reclaimed water (beneficial reuse) and discharge of secondary or tertiary effluent to the South Bay Ocean Outfall.

Annual Totals

Year	SBWRP Influent (million gals)	SBWRP Discharge to South Bay Outfall (million gals)	SBWRP Distributed Recycled Water (million gals)	System Return Stream (million gals)	Net removed from Metro (million gals)
2007	3,158	1,467	1,101	527	2,568
2006	2,216	1,807	73.7	341	1,881

It is likely that recycling water by North City Water Reclamation Plant is also having an impact on the total system flows. We have not yet quantified and evaluated these contributions.



Precipitation:
The total rainfall in 2007 of 4.23 inches was less than the total rainfall of 6.16 inches in 2006, continuing long-term drought conditions. Although not quantifiable, the lower influent flows are partially due to drought reduced infiltration and the continuing conservation effects we have seen over the past.

Historical perspective:
The table on this page shows past flows back to 1972. New Parshall flumes were installed and calibrated in 1985 and the bugs were worked out over the next year, this accounts for the major jump over the three year period from 1984 to 1986. From 1986 on multiple meters on the flumes have been calibrated yearly and fairly closely match Venturi meter data at Pump Station II (see tables in the Plant Operations section).

The historical picture of changes to the flow rates and the factors effecting those changes are discussed comprehensively in previous Annual Reports. Those factors include:

- Weather patterns, drought, and water conservation.
- The Tijuana Interceptor.
- Water Reclamation and Reuse by the North City Water Reclamation Plant, and later, by the South Bay Water Reclamation Plant.
- Population.
- Industrial discharger.

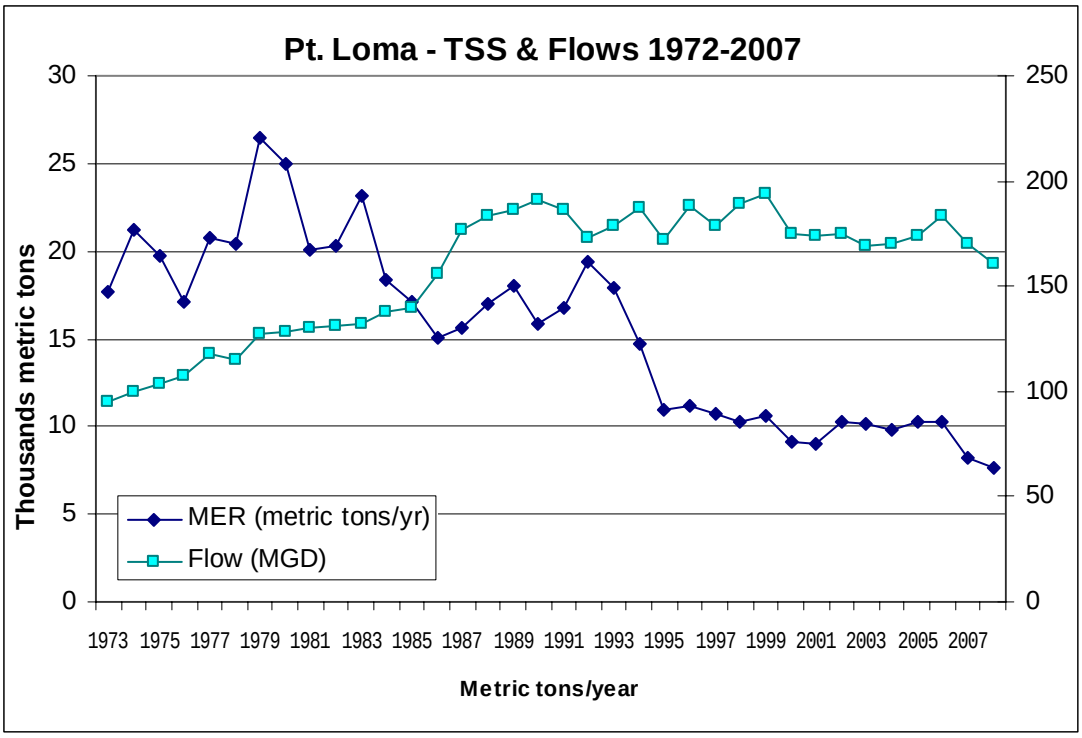
Historical Average Daily Flows

YEAR	FLOW (MGD)	YEAR	FLOW (MGD)
1972	95	1990	186
1973	100	1991	173
1974	104	1992	179
1975	107	1993	187
1976	118	1994	172
1977	115	1995	188
1978	127	1996	179
1979	128	1997	189
1980	130	1998	194
1981	131	1999	175
1982	132	2000	174
1983	138	2001	175
1984	140	2002	169
1985	156	2003	170
1986	177	2004	174
1987	183	2005	183
1988	186	2006	170
1989	191	2007	161

Weather and the various components of water conservation have emerged as more significant factors affecting flows, supplanting the historical role that population growth played.

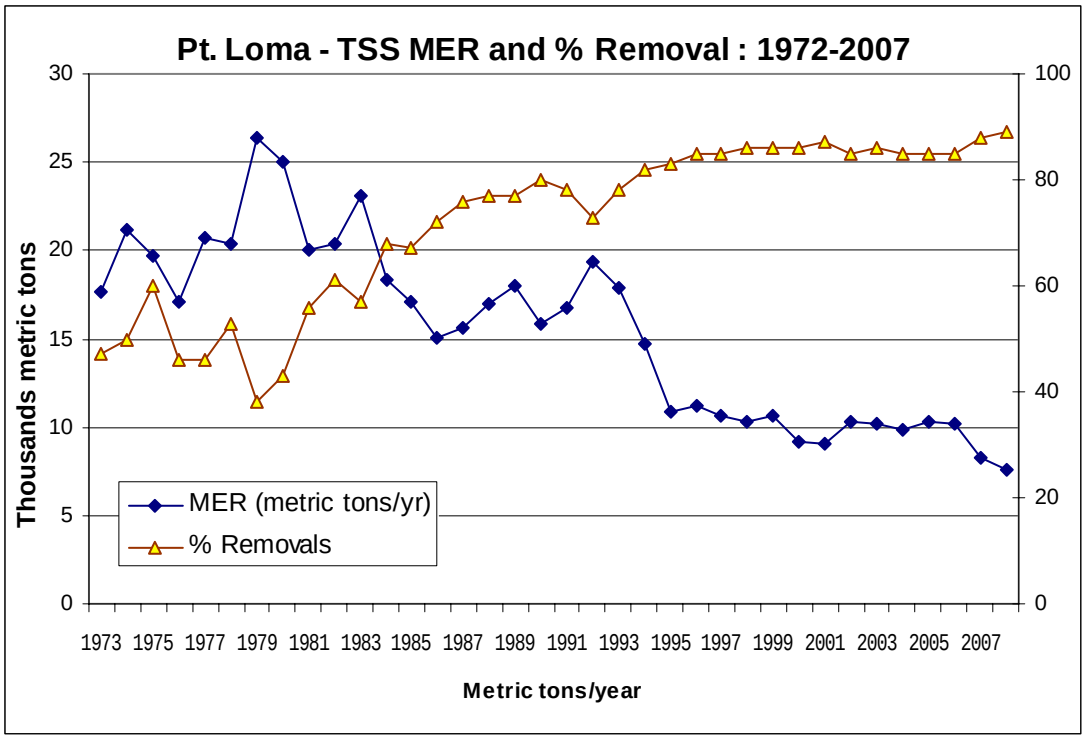
Suspended Solids, Volatile Suspended Solids and Percent Suspended Solids Removal:

Past data, as can be seen in the tables on the following pages, has shown that influent concentrations tend to range from the mid-200's to around 300. The influent suspended solids averaged 319 mg/L this year. This combines with a similar decrease in average daily flows this year resulting in a drop in mass emissions of solids again this year.



Severe drought this year added to the additional reduction of total flows to Pt. Loma WWTP. Flows continue to follow the trend of decreasing flows described in past reports and include many of the same factors as described earlier although the increasing utilization of capacity at the SBWRP is becoming an increasingly significant factor in reducing flows to PLWWTP from the Metro system.

The reduction in TSS mass emissions rate is attributable to the increase removals obtained this year, 89% compared to last year's 88% removals, rather than to a reduction of flows alone. You can see that removal rates correlate very closely with Mass Emission Rate (MER), as expected. Effluent TSS concentration goes down from year-to-year, following the MER pattern.



The historical picture of changes in the annual TSS removals and MER and the factors effecting those changes are discussed comprehensively in previous Annual Reports. The factors include:

- Changes in base industries, e.g. Tuna canneries, etc.
- Weather and infiltration.
- Sludge handling.
- Water reclamation plants.
- Population changes.
- Tijuana Interceptor.

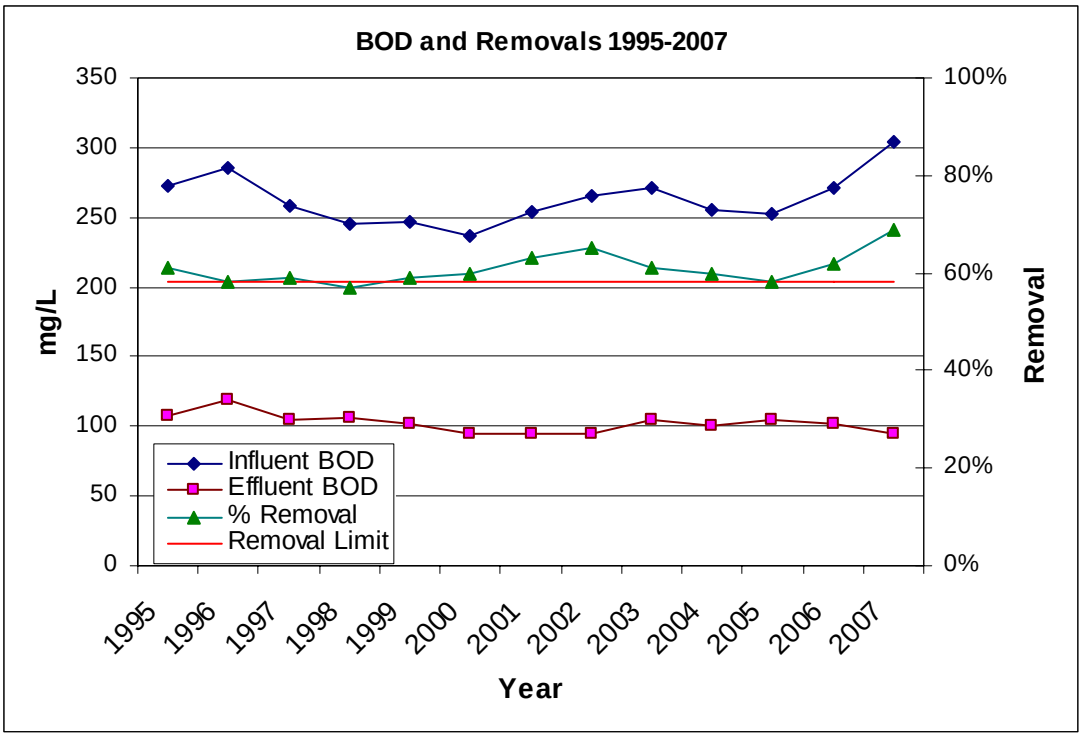
SUSPENDED SOLIDS TRENDS
AVERAGE DAILY SOLIDS

Year	Flow, Annual Average Daily (mgd)	Rainfall, Annual Total (inches)	TSS INFLUENT (mg/L)	TSS EFFLUENT (mg/L)	TSS % Removal	TSS Mass Emission (lbs/day)	TSS Mass Emission (metric tons /year)
1972	95		257	135	47	106,600	17,661
1973	100		310	154	50	127,947	21,197
1974	104		346	138	60	119,143	19,739
1975	107		215	115	46	103,135	17,087
1976	118		238	127	46	125,281	20,756
1977	115		273	128	53	123,277	20,424
1978	127		245	151	38	159,428	26,413
1979	128		248	143	43	150,933	25,006
1980	130		255	113	56	121,088	20,061
1981	131		289	114	61	122,705	20,329
1982	132		296	126	57	139,563	23,122
1983	138		310	98	68	110,789	18,355
1984	140		272	90	67	103,175	17,093
1985	156		251	70	72	91,190	15,108
1986	177		261	64	76	94,476	15,652
1987	183		289	67	77	102,257	16,941
1988	186		303	70	77	108,587	17,990
1989	191	3.8	305	60	80	95,576	15,834
1990	186	7.29	307	65	78	101,301	16,783
1991	173	13.46	295	81	73	116,810	19,352
1992	179	12.71	317	72	78	107,903	17,877
1993	187	17.26	298	55	82	88,724	14,699
1994	172	9.43	276	46	83	65,777	10,898
1995	188	17.04	289	43	85	67,492	11,182
1996	179	7.27	295	43	85	64,541	10,693
1997	189	7	284	39	86	61,923	10,259
1998	194	16.05	278	39	86	64,171	10,631
1999	175	5.43	273	38	86	55,130	9,134
2000	174	6.9	278	37	87	54,413	9,015
2001	175	8.45	275	43	85	61,931	10,260
2002	169	4.23	287	44	86	61,493	10,188
2003	170	9.18	285	42	85	59,459	9,851
2004	174	12.69	291	43	85	62,028	10,276
2005	183	14.02	274	41	85	61,768	10,233
2006	170	6.16	287	35	88	49,581	8,214
2007	161	4.23	319	34	89	45,822	7,591

(In the table there is more scatter in the data before 1980 because monthly averages were calculated using only the two suspended solids values done on "complete analysis" days, rather than averaging all of the daily test results).

BOD – Biochemical Oxygen Demand

While the 2007 the average influent BOD concentration rose from 271-mg/L to 304-mg/L, the effluent concentration dropped from 102-mg/L to 95-mg/L, reflecting an increase in the removal rate to 69%.



BOD Concentration mg/L

	Influent	Effluent	% Removal
1995 – Total	273	107	61%
Adjusted Total*	270	107	60%
Soluble	99	79	20%
1996 – Total	285	119	58%
Adjusted Total*	283	119	58%
Soluble	104	89	14%
1997 – Total	258	105	59%
Adjusted Total*	256	105	59%
Soluble	92	79	14%
1998 – Total	246	106	57%
Adjusted Total*	244	106	57%
Soluble	89	81	9%
1999- Total	247	102	59%
System-wide Total	251	102	59%
Soluble	96	79	18%
2000 – Total	237	94	60%
System-wide Total	248	94	62%
Soluble	84	69	18%
2001 – Total	254	94	63%
System-wide Total	270	94	65%
Soluble	84	58	31%
2002 – Total	266	94	65%
System-wide Total	287	94	67%
Soluble	86	59	31%
2003 – Total	271	105	61%
System-wide Total	292	105	64%
Soluble	86	70	19%
2004 – Total	255	101	60%
System-wide Total	273	101	63%
Soluble	80	70	12%
2005 – Total	252	105	58%
System-wide Total	269	105	61%
Soluble	88	75	15%
2006 – Total	271	102	62%
System-wide Total	295	102	65%
Soluble	87	73	16%
2007 – Total	**304**	**95**	**69%**
System-wide Total	**317**	**95**	**70%**
Soluble	**85**	**68**	**19%**

H. Special Studies

Two significant special studies were conducted by the Wastewater Chemistry Services Section of the Environmental Monitoring and Technical Services (EMTS) Division in 2007. A summary of each follows.

BOD-Seawater effect

On January 11, 2007 an experiment was initiated to determine the effect of native seawater on the Pt. Loma Wastewater Treatment Plant (PLWWTP) effluent BOD. The question was; Is there an effect on BOD from seawater other than that attributable to dilution alone?

BOD concentrations of seawater and effluent were determined for Pt. Loma WWTP effluent alone and in various concentration combinations with freshly obtained seawater. Additional samples were run as controls and to measure variance and accuracy. The experiment was designed to keep the amount of effluent (PLE) constant, while varying the relative proportion of seawater over a representative range.

The results showed no significant difference in BOD values for any of the effluent samples, regardless of proportion of seawater. There was no detectable effect on effluent BOD from seawater. All values are within the expected ± 10% variation replicate measurements and within the ±4.0 mg/L at the 99% confidence level.

PCBs as Congeners in Wastewater

Summary

In this study our goal was to simply determine if target PCB congeners were present in Pt Loma Wastewater Treatment Plant (WWTP) influent and effluent. A total of 28 Influent and effluent samples were taken between September and December 2007. No PCB (poly-chlorination biphenyl) congeners were identified in any sample. It is highly unlikely that PCBs are a significant pollutant, if present at all, in wastewater streams at the Pt. Loma WWTP. Aroclor determinations are based on detection of selected congeners in particular patterns. That leaves the question; Are individual isolated PCB congeners present but not identified?

An additional 17 samples from the Metro system plants were also analyzed for PCB congeners including SBWRP and NCWRP influents, effluents, reclaimed water, and other treatment products (e.g. primary effluent, raw and digested sludge, etc.). No PCB congeners were detected in any wastewater sample.

Background

Dating back some 25 years the City of San Diego has tested wastewater and ocean sediments for PCB's as Aroclor®. Aroclors have not been detected in any of the Pt. Loma WWTP influent or effluent streams. For about the past decade, the determination of PCBs in fish tissue and sediments have been for PCB congeners rather than as Aroclors, leaving a somewhat bifurcated set of data.

Aroclors® are commercial mixtures of various individual PCB Congeners (at stated

percentages) as marketed by the Monsanto Corporation.

Beginning in September 2007 the regularly sampled influent and effluent wastewaters from Point Loma Wastewater Treatment plant were analyzed for PCB's as congeners in addition to our regular testing for Aroclor's. Our normal EPA Method 608 is capable of allowing single peak PCB congener identification to take place during the normal course of chlorinated pesticide testing. The necessary modification was simply an instrumental software adjustment using a method from our existing congener analysis in sediments and fish.

Methodology

Samples for these determinations were taken on regular monitoring schedule between September 2007 and December 2007. A one liter aliquot of each regular monitoring sample from the Pt. Loma WWTP was extracted with methylene chloride using the standard procedure for EPA Method 608. The solvent is exchanged with hexane and the sample concentrated by evaporation. Cleanup with florisil and sulfur removal is performed on the concentrated sample. The clean extract was analyzed by GC/ECD/MS (Gas Chromatography/Electron Capture Detector and Mass Selective Detector). For these determinations, the sample aliquots were treated with PCB congener surrogates and a separate aliquot of the 608 concentrated extract was run on GC-ECD/MSD.

The method is adapted from the procedures in EPA Method 608 and SW-846 Method 8082A. Qualitative determination was made with a Varian 3800 Ion Trap Mass Spectrometer following separation by capillary column gas chromatography. This instrument, methods, and operating conditions mirrored those in use for congener determinations as regularly performed for all congener analysis methods used in the lab. The industry standard DBXLB column was used and mated with and Electron Capture Detector and an Ion Trap Mass Spectrometer.

A low level PCB congener standard (0.625 ppb) containing all of the target congeners was analyzed and chromatographic data from the influent and effluent samples was evaluated against the standard information. Peaks at relative retention times and presence of parent and daughter ions were the qualitative criteria used to judge detection. While a complete Method Detection Limit experiment was not performed for this study, estimated detectable concentrations for the most abundant congeners (in wastewater) range from 0.4 – 0.8 ppb.

Results and Conclusions

No PCB congeners were found in either the influent or effluent samples.

This study captured a significantly broad time span and at sufficiently low levels (0.4-0.8 ppb) that PCB congeners, if present, would have been identified. It is highly unlikely that PCBs are a significant pollutant, if present at all, in wastewater streams at the Pt. Loma WWTP.

A full report is available on request.