



METRO TAC AGENDA
(Technical Advisory Committee to Metro JPA)

TO: Metro TAC Representatives and Metro Commissioners

DATE: Wednesday, March 20, 2013

TIME: 11:00 p.m. to 1:30 p.m.

LOCATION: MWWD, 9192 Topaz Way, (MOC II Auditorium) – Lunch will be provided

****PLEASE DISTRIBUTE THIS NOTICE TO METRO COMMISSIONERS AND METRO TAC REPRESENTATIVES****

1. Review and Approve MetroTAC Action Minutes for the Meetings of [February 20, 2013](#) (**Attachment**)
2. Metro Commission/JPA Board Meeting Recap (Standing Item)
3. Public Utilities Financial Presentation (**Attachment**) (Lee Ann Jones-Santos)
4. **ACTION:** 2010 Exhibit E Audit Presentation (**Attachment**) (Kevin Starkey, Macias Gini & O'Connell)
5. Metro Strength Billing Evaluation Report (**Attachment**) (Brown & Caldwell)
6. Metro Wastewater Update (Standing Item)
7. Metro Capital Improvement Program and Funding Sources (Standing Item)
8. Financial Update (Karyn Keese)
9. MetroTAC Work Plan (Standing Item) (**Attachment**)
10. Padre Dam Mass Balance Correction (Standing Item)
11. Review of Items to be Brought Forward to the next Metro Commission/Metro JPA Meeting **March 7, 2013.**
12. Other Business of Metro TAC
13. Adjournment ([To the next Regular Meeting, April 17, 2013](#))

Metro TAC 2013 Meeting Schedule

January 16	May 15	September 18
February 20	June 19	October 16
March 20	July 17	November 20
April 17	August 21	December 18

AGENDA ITEM 1

Attachment

Metro TAC
(Technical Advisory Committee to Metro JPA)

ACTION MINUTES

DATE OF MEETING: February 20, 2013

TIME: 11:00 AM

LOCATION: MWWD, MOC II, Auditorium

MEETING ATTENDANCE:

Greg Humora, La Mesa
Al Lau, Padre Dam MWD
Dennis Davies, El Cajon
Karen Jassoy, Padre Dam MWD
Tom Howard, Poway
Bob Kennedy, Otay WD
Dan Brogadir, County of San Diego
Roberto Yano, Chula Vista
Ed Walton, Coronado
Joe Smith, National City

Art Madrid, La Mesa
Edgar Patino, City of San Diego
Peggy Merino, City of San Diego
Jeffrey Pasek, City of San Diego
Marsi Steirer, City of San Diego
Jaime Richards, City of San Diego
Tom Alspaugh, City of San Diego
Tung Phung, City of San Diego
Karyn Keese, Atkins
Shawn Hagerty, BBK

1. Review and Approve MetroTAC Action Minutes for the Meetings of January 16, 2012

On a motion by Tom Howard and seconded by Dennis Davies the minutes passed unanimously.

2. Metro Commission/JPA Board Meeting Recap

There was no Metro Commission/JPA meeting in January.

3. Financial Update

Karyn Keese reviewed the following items for Metro TAC. Ms Keese had attended the IROC February meeting because it was all finance related and included Metro issues of interest to the JPA:

- a. San Diego's draft rate case was presented to IROC. They have referred the Rate Case to their Finance Committee for in-depth review. Ms. Keese will be joining the IROC Finance Committee in this review.
- b. Lee Ann Jones-Santos gave a presentation at IROC on Finance 101 or how to read a financial statement. She will give parts of that presentation to Metro TAC and the Metro Commission/JPA Finance Committee as part of the 2010 Exhibit E process.
- c. At their February meeting IROC asked the same question that Metro TAC had about when they would see the 2014 budget – before or after it went to the Mayor. Staff response was inconclusive.
- d. IROC's Finance Committee has requested a report from staff on potential infill for recycled water.
- e. 2010 Exhibit E audit is in partner review.
- f. 2011 Exhibit E sample ready for JPA review. Karyn Keese and Karen Jassoy will perform the review in March.

4. **US Supreme Court Decision in LA County vs. NRDC Case (Shawn Hagerty, BBK)**

The U.S. Supreme Court issued an important decision earlier this year in the above referenced case, holding that the flow of water from an improved portion of a navigable waterway into an unimproved portion of the same waterway does not qualify as a discharge of pollutants subject to the Clean Water Act (CWA). This is important for several reasons:

- It affirms the Court's prior decision that the movement of water within a river system is not subject to permitting under the CWA.
- It demonstrates that there are outer limits to the CWA's pollutant discharge program. For liability to exist there must be evidence of a discharge from a point source that is owned or operated by the discharge.
- It stops the potential infighting between upstream and downstream dischargers about who is responsible for pollution discharges.

5. **Limnology and Reservoir Detention Study of San Vicente Reservoir (a component of the Water Purification Demonstration Project (Marsi Steirer/Jeff Pasek)**

PUD staff presented the draft findings of the above referenced Study. There are seven major components of the IPR Demonstration Project. This study is one of the seven. The Study focused on the effects of putting highly treated wastewater into the San Vicente Reservoir in relation to nitrogen, phosphorous, and algae. A model was created to study these effects and one of the major conclusions was that the current stratification of the reservoir will exist in the expanded reservoir. The reservoir is currently being raised 117 feet and will triple the size. Construction is almost complete and filling is beginning. It is estimated that filling the expanded reservoir with water will take 3 to 5 years. The results of the model showed no significant issues with the discharge of highly treated wastewater into the drinking water source. The data from the model has been shared with the Department of Health and the Regional Board. Staff has received conditional acceptance supporting the project. PUD staff is working on a final presentation which will be presented to the Metro JPA/Commission in the next couple months.

6. **Metro Wastewater Update**

Marsi Steirer reported that PUD staff had a kick-off meeting on the waiver. Staff in attendance included Roger Bailey, Marsi, Guann Hwang, Steve Meyers, and Allan Langworthy. The workgroup is looking into how the waiver gets integrated with IPR and what the next steps are. Preparation of the waiver will begin in early 2014. The waiver needs to be completed by February 2015.

7. **Action: Generators for Emergency Backup Power at Various Facilities. (Tom Alspaugh)**

PUD staff gave a presentation (Copy included as Attachment A) and requested approval of Phase II (construction) for the installation of 7-2MW generators and purchase and installation of 500KW generator at EMTS Lab. The project will be design/build and provide permanent pads for the trailer mounted generators. Each installation will include three day storage of diesel fuel and a fuel polishing system. On a motion by Greg Humora, seconded by Tom Howard, Metro TAC unanimously approved moving this item forward to the Metro JPA/Commission for their review and potential approval.

8. **Metro Capital Improvement Program and Funding Sources (Tung Phung)**

PUD staff presented the Quarterly Review of Metro Capital Projects. This report includes Program Highlights, Metro Project Highlights, actual expenditures this fiscal year to date versus planned expenditures based on total project costs, project forecast versus actual expenditures on a per project basis, an update to project schedules and a change order summary. Change orders are only shown on this schedule on a cumulative basis per project when they exceed 10% of total original project costs. No change orders are currently shown. It was the consensus of the Metro TAC members that this report should go to the Metro JPA/Commission in March.

9. IRWMP Meeting Update (Bob Kennedy)

Bob Kennedy attended their last meeting on February 6, 2013. The Metro JPA/Commission was added as an official member. Bob will be serving on the Water Quality Group. The next meeting will be April 3, 2013.

10. Metro JPA Mid-Year Financials (Karen Jassoy)

Karen Jassoy presented the mid-year financials. Year to date the JPA is substantially under budget mainly because the majority of the Atkins projects have been pushed off to the last half of the year. These include the San Diego rate case review, which just started in February, the field work on the 2011 and 2012 audits which will begin in March, and the recycled revenue issue which will start in late March/early April. Karen will present this to the Metro JPA/Commission in March.

11. MetroTAC Work Plan (Standing Item)

The Work Plan was updated in multiple areas. The updated work plan is included in this agenda packet under its standing item. The updates are shown in red italics.

12. Padre Dam Mass Balance Correction (Standing Item)

The PA attorney's group is still meeting.

13. Review of Items to be Brought Forward to the next Metro Commission/Metro JPA Meeting March 7, 2013.

Items 7, 8 and 10 will be brought forward to the Metro JPA/Commission at their March meeting.

14. Other Business of Metro TAC.

Tom Howard reported that he had participated in the selection panel for the Optimization Study and the presentations were very impressive.

15. Adjournment (To the next Regular Meeting, March 20, 2013)

ATTACHMENT A



The City of San Diego



Presentation to Metro TAC



City of San Diego Public Utilities Department Backup Generators (BUGs) Project Status Report

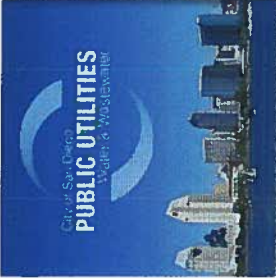
Thomas Alspaugh

February 20, 2013



Background

- On September 8, 2011 San Diego was subjected to a regional power outage.
- Sewage spills occurred upstream of Pump Station 1 and 64.
- These two Pump Stations meet EPA requirements for power redundancy (two independent power feeds from SDG&E).
- To prevent future re-occurrences, on site backup diesel fueled power generators were purchased and brought on to each of five sites.
- The Environmental Monitoring and Technical Services Laboratory's 200kW backup generator was not large enough to be able to prevent loss of test samples.



Temporary Onsite Location of Generators (Phase 1: Completed)

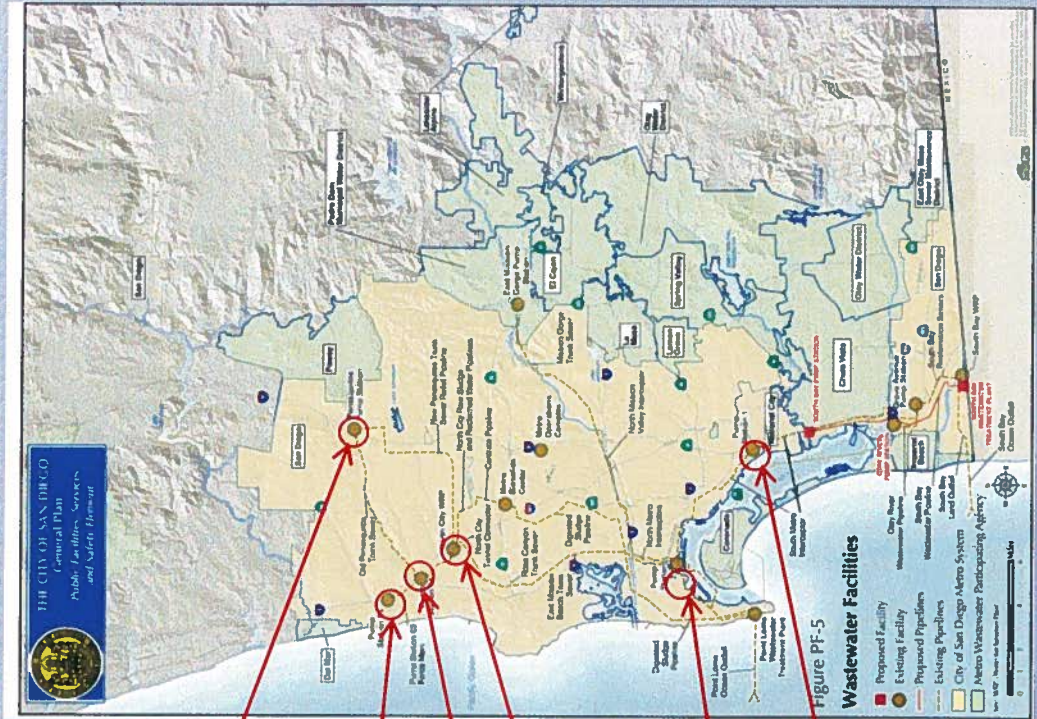
Five facilities received 2MW portable generator units purchased through the National Joint Powers Alliances with Caterpillar:

- Pump Station 1 – (2 units)
- Pump Station 64 – (2 units)
- Pump Station 65
- Penasquitos Pump Station
- North City Water Reclamation Plant (NCWRP)



Environmental Monitoring and Technical Services (EMTS) Laboratory will receive a larger 500kW generator through the Design-Build contract.

Facility Locations



**PENASQUITOS
PS**

PS 65

PS 64

NCWRP

EMTS

PS 1

Temporary Generator and Connected Transformer Staging



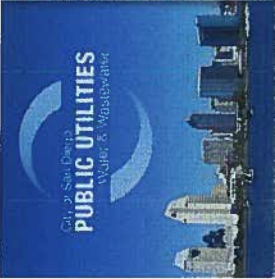
2MW Generator and transformer at North City Water Reclamation Plant

Permanent Installation (Phase 2: On-going)

The Selected Design/Build contractor will install:

- Concrete pads for the generators and transformers
- Underground conduits and cables
- Automatic transfer switches or power breakers to respond to electrical outage within minutes
- Diesel fuel storage tanks with the capacity to run the units for up to 3 days

The five of the seven 2MW generators will remain as portable units and will be able to be relocated on short notice.



Total Project Cost

PHASE 1:

➤ Pre-purchased of the seven 2MW generators, five transformers, and cables	\$ 7,178,816
➤ <u>APCD compliance contingency</u>	<u>\$ 3,771,250</u>
Previously Approved by Council	\$10,950,066

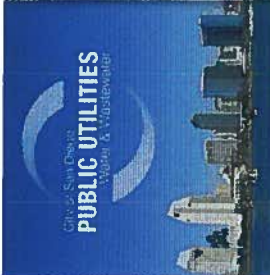
PHASE 2:

➤ Permanent Installation of all 8 generators	\$6,511,534
➤ <u>Construction Management Costs</u>	<u>\$ 284,000</u>
Additional funds requested to be authorized by this Council Action	\$6,795,534

BUDGET FOR TOTAL PROJECT COST

\$17,745,600

Funding is from Dedicated Reserve of Efficiencies and Savings Fund.



Schedule of Permanent Installation (Phase 2)

- | | |
|--|---------------|
| ➤ Issue RFP | December 2012 |
| ➤ Council Approval of Funds and Contract Award | April 2013 |
| ➤ Notice to Proceed with Construction | May 2013 |
| ➤ Complete Installation of 8 generators | December 2014 |

Thank you



AGENDA ITEM 3

Attachment



THE CITY OF SAN DIEGO

Presentation to the Metro Technical Advisory Committee

Public Utilities Financial Presentation

Lee Ann Jones-Santos

March 20, 2013





Purpose

- Provide an overview of the following:
 - Financial Statement Overview
 - Cash balances and Unrestricted Net Assets
 - FY11 to FY12 variances
 - CIP Program
 - Rate Case Assumptions for FY08 – FY11
 - Actual Expenditures FY08 – FY12
 - Projections for FY13 – FY17
 - Revenue received



THE CITY OF SAN DIEGO



Financial Statement Overview

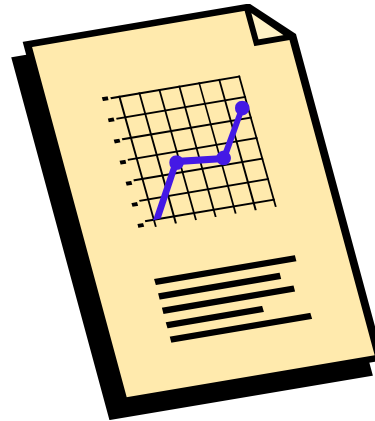
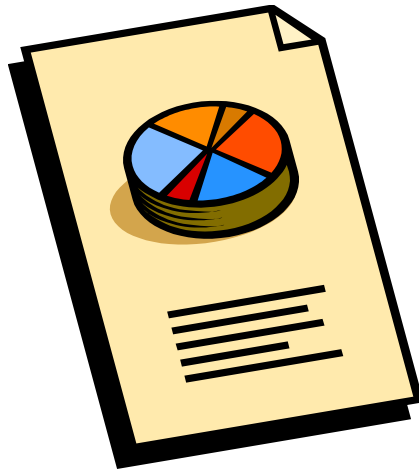




Understanding Primary Financial Statements

Statement of Revenues, Expenses, and Changes in Fund Net Assets

Statement of Net Assets



Statement of Cash Flows





Statement of Net Assets

ASSETS

Things we own of value

LIABILITIES

Things we owe

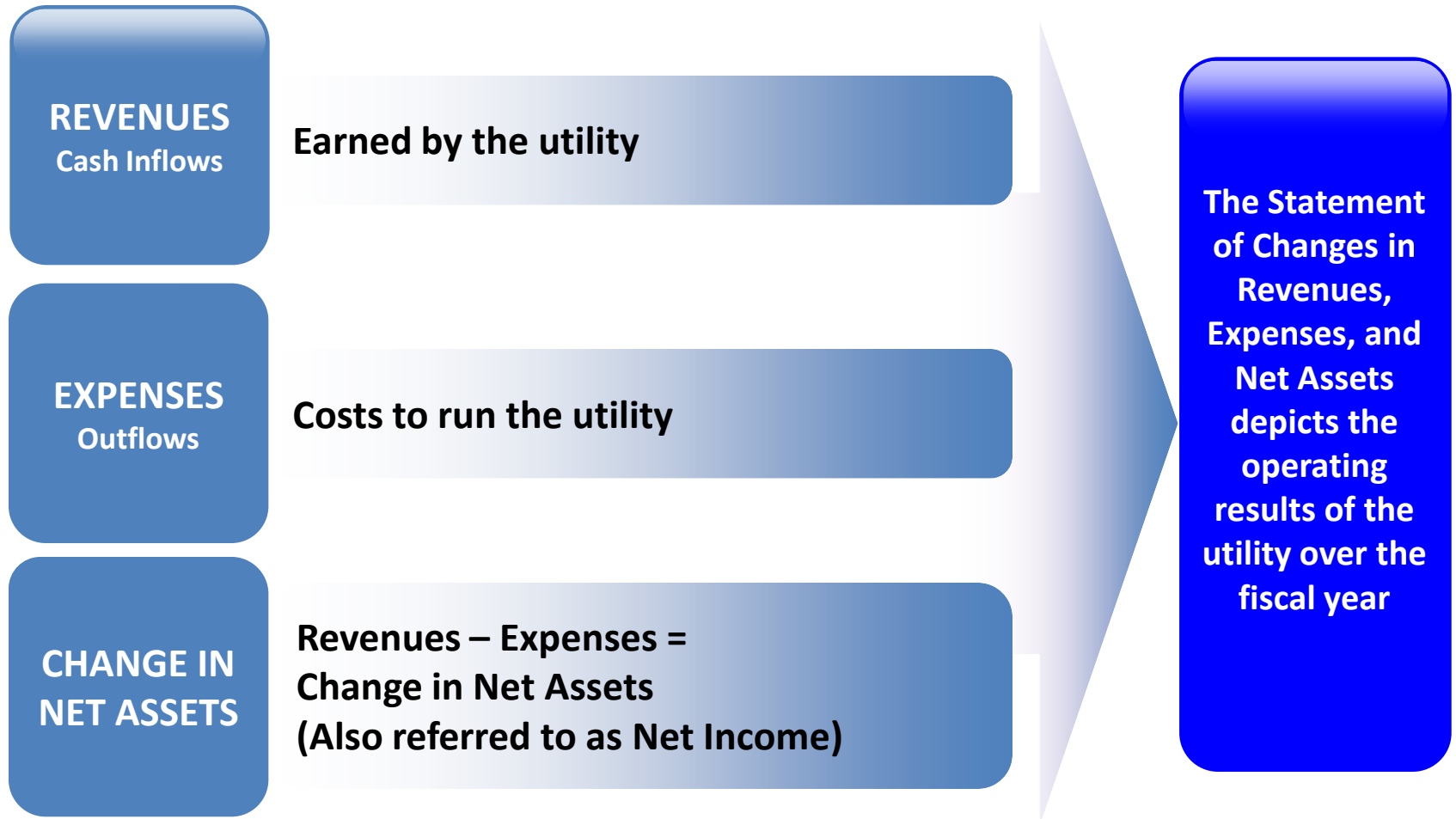
**NET
ASSETS**

Assets – Liabilities = Net Assets

**The
Statement of
Net Assets is
a “snapshot”
of the utility
on the last
day of the
fiscal year**



Statement of Changes in Revenue, Expenses, and Net Assets





The Link Between Financial Statements

- Example Transaction – Increase in Revenue with no offsetting Expense
 - Statement of Revenues, Expenses, and Changes in Fund Net Assets
 - Increase in Revenue
 - Increase in Net Income
 - (Revenue minus Expense equals Net Income)
 - Statement of Net Assets
 - Increase in Cash
 - Increase in Unrestricted Net Assets
 - Statement of Cash Flows
 - Increase in Receipts



Fiscal Year 2012 Ending Balances

- Wastewater
 - Cash and Investments - \$433M
 - Unrestricted Net Assets - \$379M

Net Assets = Assets minus Liabilities.

For example, Accounts Receivable and Accounts Payable are included in the calculation of Unrestricted Net Assets.



Unrestricted Net Assets

- In government accounting assets with no external restriction as to use or purpose. They can be employed for any purpose designated by the governing board (i.e. City Council), as distinguished from funds restricted externally for specific purposes (i.e. Reserves for Debt Service held with Trustee).



Unrestricted Net Assets

**STATEMENT OF NET ASSETS
CITY OF SAN DIEGO - Public Utilities
YEAR ENDED JUNE 30, 2012
(In Thousands)**

	<u>SEWER</u>
Invested in Capital Assets Net of Related Debt	\$ 1,838,281
Restricted for Debt Service	9,449
Unrestricted	<u>379,114</u>
TOTAL NET ASSETS	<u>\$2,226,844</u>

ASSETS – LIABILITIES = NET ASSETS



Unrestricted Net Assets – Wastewater

STATEMENT OF NET ASSETS – WASTEWATER UTILITY As of June 30, 2012 (In Millions)

NET ASSETS - Unrestricted		\$379
Reserves (Per City Reserve Policy)	100	
Continuing Appropriations	147	
Encumbrances	87	
Undesignated	45	
		\$379



Wastewater Projected Capital Program

	FY2013	FY2014	FY2015	FY2016	Total FY2013 - FY2016
Muni CIP	\$87,723,681	\$92,885,183	\$84,216,116	\$61,855,102	\$326,680,082
Metro CIP	\$21,220,524	\$28,634,808	\$38,127,124	\$26,629,011	\$114,611,467
Total CIP	\$108,944,205	\$121,519,990	\$122,343,240	\$88,484,113	\$441,291,549



THE CITY OF SAN DIEGO



CIP Program





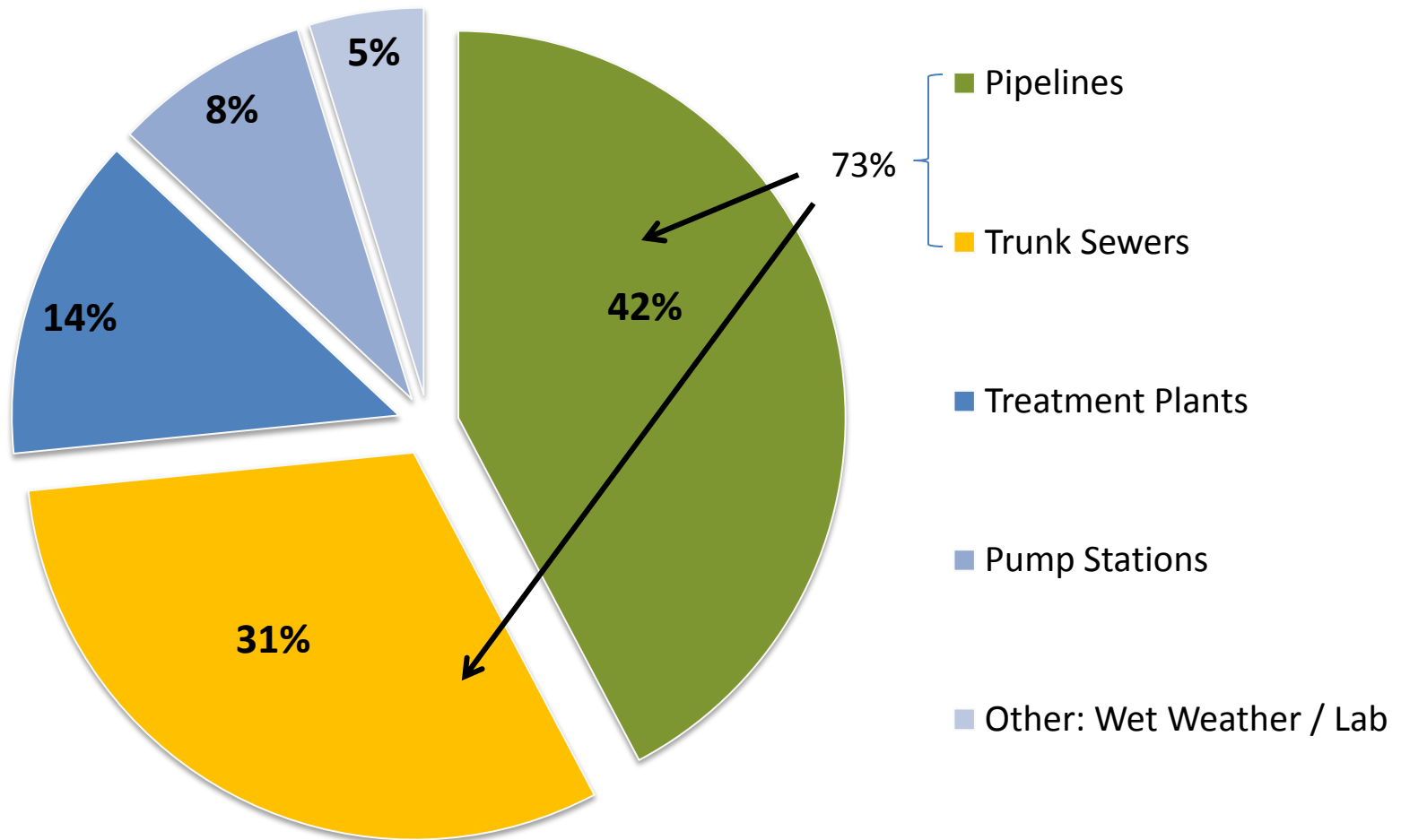
Wastewater Fund FY2008 – FY2011 Capital Program Overview*

- WASTEWATER
 - 50 Projects (Individual and “Annual Allocation”)
 - City Municipal system
 - Force mains, trunk sewers, pump stations
 - Metro system
 - Bio-solids storage, centrifuges, grit processing, control system upgrades, pump stations
 - 33.5% funded by Metropolitan System Joint Powers
 - \$585 million
 - EPA Consent Decree

*As Proposed in the 2007 Rate Case



Wastewater Fund FY2008 – FY2011 \$585M Planned Capital Program





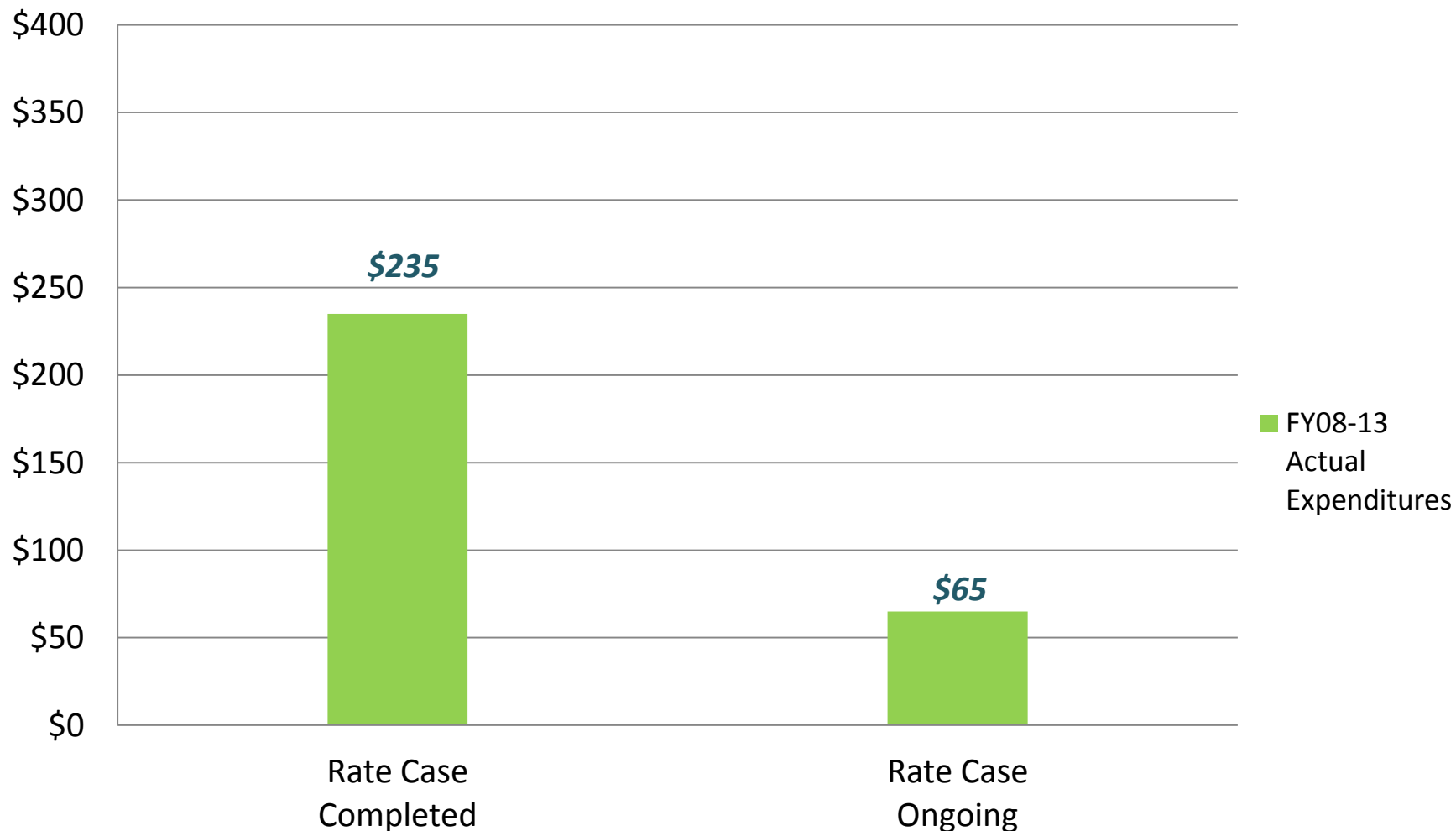
CIP Execution (Actual FY2008 - FY2013)*

- WASTEWATER
 - 23 Projects completed - \$235M
 - 14 Projects on-going - \$65M
 - 13 Projects Cancelled/On Hold
- CIP execution initially delayed in FY2008
 - City still met regulatory requirements

*As of December 2012



Wastewater Fund CIP Expenditures FY2008 – FY2013* (In \$ Millions)



* As of December 2012. Includes only Rate Case Projects.



Wastewater CIP Expenditures Rate Case vs. Actual (FY2008 - FY2013)

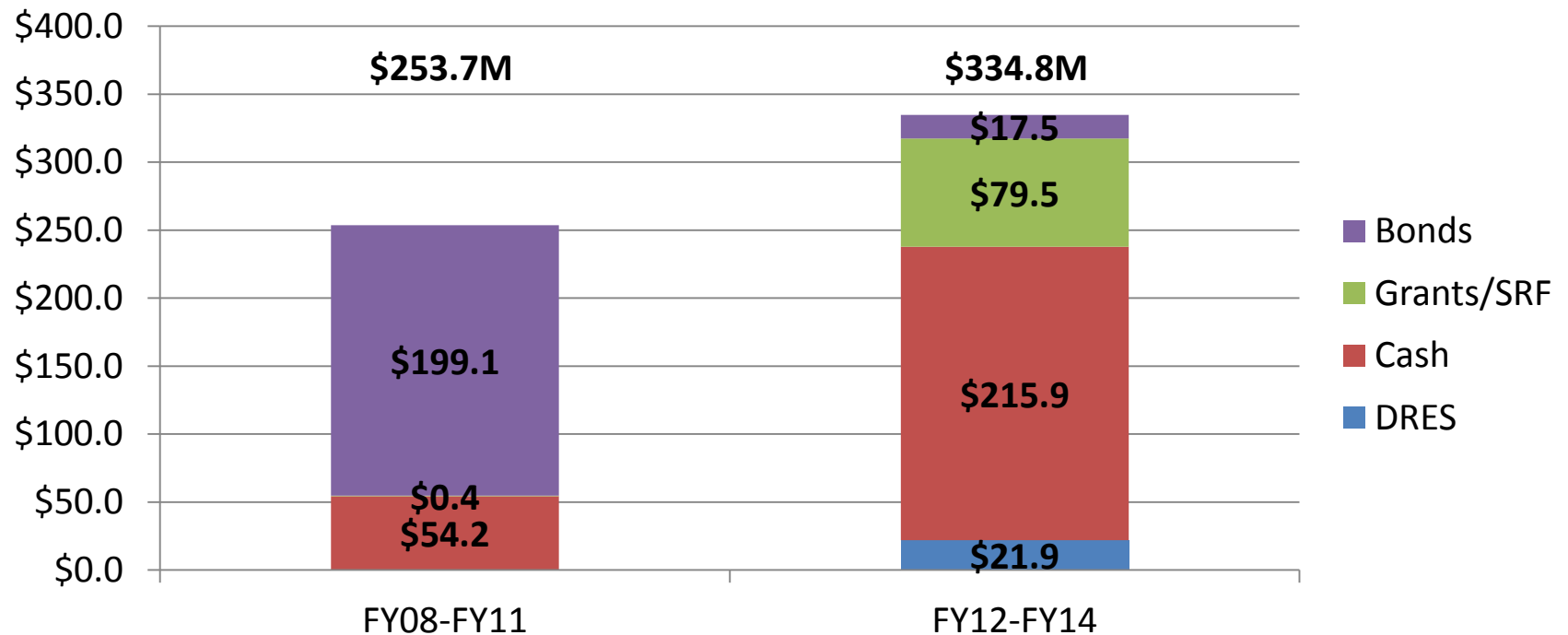
	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	Total FY2008- FY2013
Projected Capital Expenditures (COSS Table 5-3)	\$95,986,546	\$119,490,811	\$185,477,318	\$184,419,306	N/A	N/A	\$585,373,981
Actual Capital Expenditures	\$29,802,707	\$50,016,290	\$80,104,243	\$93,701,014	\$104,280,026	\$108,944,205	\$466,848,485
Variance (Actuals less Projected)	(\$66,183,839)	(\$69,474,521)	(\$105,373,075)	(\$90,718,292)	\$104,280,026	\$108,944,205	(\$118,525,496)

DRAFT – pending Review of Funds Completion



Wastewater CIP Financing

(in \$ Millions)



Figures rounded



THE CITY OF SAN DIEGO



Revenue Received





Wastewater Rate Increase Revenues Rate Case vs. Actual (FY2008-FY2011)

	FY2008 ⁽¹⁾	FY2009	FY2010	FY2011	Total FY2008- FY2011
Revenue from Rate Increase (COSS Table 5-5) ⁽²⁾	\$25,196,800	\$47,150,500	\$68,729,100	\$90,323,300	\$231,399,700
Actual Additional Revenue solely from Rate Increases ⁽²⁾ (calculated)	\$27,531,185	\$43,786,218	\$63,278,867	\$71,914,292	\$206,510,562
Surplus (Deficit) of revenues from rate increase	\$2,334,385	(\$3,364,282)	(\$5,450,233)	(\$18,409,008)	(\$24,889,138)

DRAFT – pending Review of Funds Completion

(1) FY2008 includes rate increase revenue from FY2007

(2) Rate Increases Effective May 1st each FY

FY2007 - FY2008 : 8.75%

FY2009 - FY2010: 7.00%



THE CITY OF SAN DIEGO

Questions?





Investor Information

- Link –
<http://www.sandiego.gov/investorinformation/terms.shtml>
 - This will take you to the investor information page where you need to click “OK” to proceed (at bottom of page)
 - Includes CAFR, Continuing Disclosures, Official Statements, Current Credit Ratings, etc.

AGENDA ITEM 4

Attachment

**CITY OF SAN DIEGO PUBLIC
UTILITIES DEPARTMENT**

Schedule of Allocation for Billing to Metropolitan
Wastewater Utility and Independent Auditor's Reports

For the Fiscal Year Ended June 30, 2010

CITY OF SAN DIEGO PUBLIC UTILITIES DEPARTMENT
Schedule of Allocation for Billing to Metropolitan Wastewater Utility
and Independent Auditor's Reports
For the Fiscal Year Ended June 30, 2010

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Schedule of Allocation for Billing to Metropolitan Wastewater Utility	3
Notes to the Schedule of Allocation for Billing to Metropolitan Wastewater Utility	4-6
Independent Auditor's Report on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of the Schedule of Allocation for Billing to Metropolitan Wastewater Utility Performed in Accordance with <i>Government Auditing Standards</i>	7-8



Certified Public Accountants.

San Diego
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San Diego, CA 92101
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Sacramento

Walnut Creek

Oakland

LA/Century City

Newport Beach

Seattle

To the Honorable Mayor and City Council
of the City of San Diego
San Diego, California

**INDEPENDENT AUDITOR'S REPORT ON SCHEDULE OF ALLOCATION
FOR BILLING TO METROPOLITAN WASTEWATER UTILITY**

We have audited the accompanying Schedule of Allocation for Billing to Metropolitan Wastewater Utility (the Schedule) of the City of San Diego Public Utilities Department (the PUD), an enterprise fund of the City of San Diego (the City) for the fiscal year ended June 30, 2010. The Schedule is the responsibility of the PUD's and the City's management. Our responsibility is to express an opinion on the Schedule based on our audit.

We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the Schedule is free of material misstatement. An audit includes consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the PUD's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the Schedule, assessing the accounting principles used and the significant estimates made by management, as well as evaluating the overall Schedule presentation. We believe that our audit provides a reasonable basis for our opinion.

As described in Note 3, the accompanying Schedule referred to above was prepared for the purpose of complying with, and in conformity with the accounting practices prescribed by the Regional Wastewater Disposal Agreement between the City and the Participating Agencies in the Metropolitan Wastewater System dated May 18, 1998, and amended on May 15, 2000, and June 3, 2010. Accordingly, the Schedule is not intended to present the financial position or the changes in the financial position of the PUD in conformity with accounting principles generally accepted in the United States of America.

In our opinion, the Schedule referred to above presents fairly, in all material respects, the allocation for billing to Metropolitan Wastewater Utility of the PUD for the fiscal year ended June 30, 2010 on the basis of accounting described in Note 3.

In accordance with *Government Auditing Standards*, we have also issued our report dated February 21, 2013, on our consideration of the PUD's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* and should be considered in assessing the results of our audit.

This report is intended solely for the information and use of the City Council, the Mayor, the City, the PUD's management, and Metro Commission/Metro Wastewater JPA Board and is not intended to be and should not be used by anyone other than these specified parties. However, this report is a matter of public record and its distribution is not limited.

Macias Fini & O'Connell LLP

San Diego, California
February 21, 2013

CITY OF SAN DIEGO PUBLIC UTILITIES DEPARTMENT
SCHEDULE OF ALLOCATION FOR BILLING TO METROPOLITAN WASTEWATER UTILITY
FOR THE FISCAL YEAR ENDED JUNE 30, 2010

	Operating Expenses		
	Municipal System	Metropolitan System	Total
Transmission			
Main Cleaning	\$ 12,093,833	\$ -	\$ 12,093,833
Sewer Pump Stations	6,090,380	-	6,090,380
Other Pump Stations	5,010,777	1,006,415	6,017,192
Pump Station 1	-	2,963,981	2,963,981
Pump Station 2	-	6,874,828	6,874,828
Other Muni Agencies	2,709,411	-	2,709,411
Pipeline Maintenance & Repair	10,860,022	50,867	10,910,889
Wastewater Collection (WWC) Engineering and Planning	4,564,937	-	4,564,937
Total Transmission	41,329,360	10,896,091	52,225,451
Treatment and Disposal			
Point Loma Wastewater Treatment Plant (PTLWWTP)	-	22,818,340	22,818,340
North City Water Reclamation Plant (NCWRP)	-	9,016,846	9,016,846
South Bay Water Reclamation Plant (SBWRP)	-	6,808,355	6,808,355
Metropolitan Biosolids Center (MBC)	-	15,919,143	15,919,143
Gas Utilization Facility (GUF)	-	1,259,233	1,259,233
Total Treatment and Disposal	-	55,821,917	55,821,917
Quality Control			
Sewage Testing and Control	2,787,829	293,386	3,081,215
Marine Biology and Ocean Operations	-	4,692,693	4,692,693
Wastewater Chemistry Services	-	5,915,069	5,915,069
Industrial Permitting and Compliance	3,334,915	-	3,334,915
Total Quality Control	6,122,744	10,901,148	17,023,892
Engineering			
Program Management & Review	880,032	6,301,612	7,181,644
Environmental Support	324,337	429,704	754,041
Total Engineering	1,204,369	6,731,316	7,935,685
Operational Support			
Central Support Commnet/Comc	578,102	4,371,159	4,949,261
Operational Support	1,530,624	10,278,938	11,809,562
Total Operational Support	2,108,726	14,650,097	16,758,823
General and Administrative			
Business Support Admin	31,036,932	20,789,231	51,826,163
Operating Division Admin	5,149,884	4,142,617	9,292,501
Total General and Administrative	36,186,816	24,931,848	61,118,664
TOTAL EXPENSES	86,952,015	123,932,417	210,884,432
CAPITAL IMPROVEMENT EXPENSE	70,053,201	10,863,476	80,916,677
DEBT SERVICE ALLOCATION	45,114,632	64,507,673	109,622,305
METROPOLITAN SYSTEM INCOME CREDITS			
Operating Revenue	-	(6,810,715)	(6,810,715)
Capital Improvement Project (CIP) - Revenue Bond Issue	-	(8,601,327)	(8,601,327)
Operating - Grant Revenue	-	(136,877)	(136,877)
CIP - Grant Revenue	-	(83,642)	(83,642)
TOTAL METROPOLITAN SYSTEM INCOME CREDITS	-	(15,632,561)	(15,632,561)
TOTAL ALLOCATION FOR BILLING PURPOSES	\$ 202,119,848	\$ 183,671,005	\$ 385,790,853

See accompanying notes to the Schedule of Allocation for Billing to Metropolitan Wastewater Utility.

CITY OF SAN DIEGO PUBLIC UTILITIES DEPARTMENT
Notes to the Schedule of Allocation for Billing to Metropolitan Wastewater Utility
For the Fiscal Year Ended June 30, 2010

Note 1 – General

The City of San Diego Public Utilities Department (the PUD) operates and maintains the Metropolitan Wastewater System (the Metropolitan System) and the Municipal Wastewater Collection System (the Municipal System). The Participating Agencies and the City of San Diego (the City) have entered into the Regional Wastewater Disposal Agreement dated May 18, 1998 and amended on May 15, 2000 and June 3, 2010, for their respective share of usage and upkeep of the Metropolitan Wastewater Utility. The accompanying Schedule of Allocation for Billing to Metropolitan Wastewater Utility (the Schedule), represents the allocation of expenses for billing related to the Metropolitan Wastewater Utility of the Participating Agencies.

The PUD is accounted for and reported as an enterprise fund of the City of San Diego.

Note 2 – Participating Agencies

The Participating Agencies consist of the following municipalities and districts:

City of Chula Vista	Lemon Grove Sanitation District
City of Coronado	City of National City
City of Del Mar	Otay Water District
East Otay Mesa Sewer Maintenance District	Padre Dam Municipal Water District
City of El Cajon	City of Poway
City of Imperial Beach	Spring Valley Sanitation District
City of La Mesa	Winter Gardens Sewer Maintenance District
Lakeside Sanitation District	Alpine Sanitation District

Note 3 – Summary of Significant Accounting Policies

Basis of Presentation

The Schedule has been prepared for the purpose of complying with the Regional Wastewater Disposal Agreement between the City and the Participating Agencies as discussed in Note 1 above. As a result, the Schedule is not intended to be a presentation of the financial position or the changes in the financial position in conformity with generally accepted accounting principles. The more significant differences are:

1. Purchases of capital assets are presented as capital improvement expenses.
2. Payments of principal and interest related to long-term debt are presented as debt service allocation expenses.

The preparation of the Schedule requires management to make estimates and assumptions that affect the reported amounts and disclosures. Actual results could differ from those estimates.

Note 4 – Metropolitan Wastewater Utility Capital Improvement Expense

Construction costs incurred during the fiscal year to maintain and improve the Metropolitan Wastewater Utility and equipment purchases used in the maintenance of the Metropolitan Wastewater Utility are included in capital improvement expense.

Metropolitan Wastewater Utility capital improvement income credits include, if any, contributions-in-aid-of-construction received from Federal and State granting agencies and reimbursements from bond proceeds.

CITY OF SAN DIEGO PUBLIC UTILITIES DEPARTMENT
Notes to the Schedule of Allocation for Billing to Metropolitan Wastewater Utility (Continued)
For the Fiscal Year Ended June 30, 2010

Note 5 – Debt Service Allocation Expenses

Debt service allocation expenses are that portion of the principal and interest payments relating to the Senior Sewer Revenue Bonds Series 1995, 1997A, 1997B, 1999A, 1999B, and 2009A and the Senior Sewer Revenue Refunding Bonds Series 2009B and 2010A, and outstanding loans with the State of California.

Note 6 – Metropolitan System Income Credits

Metropolitan System income credits are revenues earned by the Metropolitan System for costs incurred during the current or previous fiscal years. The PUD has agreed to share the income credits from the South Bay Water Reclamation Facility as per the 1998 Regional Wastewater Disposal Agreement. Currently, there is an unresolved issue between the Participating Agencies and the City regarding the calculation of the reclaimed water revenue. The Wastewater Division of the PUD has not collected any revenue from reclaimed water sales.

Note 7 – Total Allocation for Billing Purposes

Costs to be billed to Participating Agencies include all individual construction projects costs and operation and maintenance expenses attributable to the Metropolitan System. Costs are apportioned back to the Participating Agencies based on their percentage of each of the totals of flow, suspended solids and chemical oxygen demand (COD). Each Participating Agency and the City are sampled quarterly, with plants sampled daily. The percentages are determined from cumulative samples and monitored flow.

For construction projects, percentages were allocated to flow, suspended solids and COD based on each of the project's design and function. The percentages are weighted by total project costs and combined to determine the final three derived percentages. Total annual costs are then allocated based on the three derived percentages and the measured flow, suspended solids and COD of each Participating Agency.

Operation and maintenance (O&M) costs as a percentage of flow, suspended solids and COD are evaluated based on four cost categories: pump stations, plant operations, technical services and cogeneration. These percentages are weighted by the annual O&M costs for each category, and combined to determine a derived percentage for administrative costs. All O&M costs are then allocated based on the measured flow, suspended solids and COD of each Participating Agency.

Note 8 – Pension Benefit Costs

The rates supporting expenses related to the employer share of pension costs are actuarially determined by the San Diego City Employees' Retirement System's actuary. Employer contribution rates are set with a 2 year time-lag (i.e., rates effective in fiscal year 2010 were calculated in the fiscal year 2008 actuarial valuation). The City's enterprise funds fully paid their pension rates set by the actuary in the actuarial report prepared in fiscal year 2008 for fiscal year 2010.

Further information regarding the City's pension plan, benefits costs and funded status at June 30, 2010 can be found in the City's Comprehensive Annual Financial Report.

CITY OF SAN DIEGO PUBLIC UTILITIES DEPARTMENT
Notes to the Schedule of Allocation for Billing to Metropolitan Wastewater Utility (Continued)
For the Fiscal Year Ended June 30, 2010

Note 9 – Postemployment Healthcare Benefits

Postemployment healthcare benefits costs are measured and accrued based upon annual actuarial valuations similar to current practice with pension plans. The actuarial valuations provide information on the annual required contributions (ARC) to fund the plan. The Schedule only includes postemployment healthcare benefits expenses incurred during the fiscal year ended June 30, 2010.

Further information regarding the City's Postemployment Healthcare Benefits at June 30, 2010 can be found in the City's Comprehensive Annual Financial Report.

Note 10 – Subsequent Event

The Local Agency Formation Commission approved a reorganization of the San Diego County sanitation services during fiscal year 2011. The San Diego County Sanitation District was formed on July 1, 2011. Lakeside Sanitation District, Spring Valley Sanitation District, East Otay Mesa Sewer Maintenance District, and Winter Gardens Sewer Maintenance District were reorganized into the San Diego County Sanitation District. The reorganization, however, does not affect the allocation of expenses for billing related to the Metropolitan System of those sanitation districts.

Note 11 – Administrative Protocol

In May 2010, an Administrative Protocol (Protocol) was approved between the City of San Diego and all Participating Agencies signatory to the Regional Wastewater Disposal Agreement. The Protocol that was effective during fiscal year 2010, established that the Participating Agencies would maintain at least a 1.2 debt service coverage ratio and fund a 45 day operating reserve. In addition, the Protocol establishes that beginning with fiscal year 2010, interest would accrue on the Participating Agencies' operating reserves and undesignated account. All interest earned during fiscal year 2010 was credited to the operating reserve, which ended the fiscal year with a 42-day reserve. The Participating Agencies have agreed to contribute additional funds to bring the operating reserve into compliance with the Administrative Protocol.



Certified Public Accountants.

San Diego
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Sacramento

Walnut Creek

Oakland

LA/Century City

Newport Beach

Seattle

To the Honorable Mayor and City Council
of the City of San Diego
San Diego, California

**INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL
REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN
AUDIT OF THE SCHEDULE OF ALLOCATION FOR BILLING TO
METROPOLITAN WASTEWATER UTILITY PERFORMED IN
ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS***

We have audited the accompanying Schedule of Allocation for Billing to Metropolitan Wastewater Utility (the Schedule) of the City of San Diego Public Utilities Department (the PUD), an enterprise fund of the City of San Diego (the City), California, for the fiscal year ended June 30, 2010 and have issued our report thereon dated February 21, 2013. Our report contained an explanatory paragraph indicating that the Schedule was prepared for the purpose of complying with, and in conformity with the accounting practices prescribed by the Regional Wastewater Disposal Agreement between the City of San Diego and the Participating Agencies in the Metropolitan Wastewater System dated May 18, 1998 and amended on May 15, 2000 and June 3, 2010. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States.

Internal Control Over Financial Reporting

Management of the PUD is responsible for establishing and maintaining effective internal control over financial reporting. In planning and performing our audit, we considered the PUD's internal control over financial reporting as a basis for designing our auditing procedures for the purpose of expressing our opinion on the Schedule, but not for the purpose of expressing an opinion on the effectiveness of the PUD's internal control over financial reporting. Accordingly, we do not express an opinion on the effectiveness of the PUD's internal control over financial reporting.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. *A material weakness* is a deficiency, or a combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the Schedule will not be prevented, or detected and corrected on a timely basis.

Our consideration of internal control over financial reporting was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over financial reporting that might be deficiencies, significant deficiencies, or material weaknesses. We did not identify any deficiencies in internal control over financial reporting that we consider to be material weaknesses, as defined above.

Compliance and Other Matters

As part of obtaining reasonable assurance about whether the PUD's Schedule is free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of the Schedule's amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

We noted certain matters that we reported to management of the PUD, in a separate letter dated February 21, 2013.

This report is intended solely for the information and use of the City Council, the Mayor, the City, the PUD's management, and the Metro Commission/Metro Wastewater JPA Board and is not intended to be and should not be used by anyone other than these specified parties.

Macias Jini & O'Connell LLP

San Diego, California
February 21, 2013



THE CITY OF SAN DIEGO

February 21, 2013

Macias Gini & O'Connell LLP
225 Broadway, Suite 1750
San Diego, CA 92101

We are providing this letter in connection with your audit of the Schedule of Allocation of Billing to Metropolitan Wastewater Utility (the Schedule) of the Metropolitan System of the City of San Diego Public Utilities Department (PUD), an enterprise fund of the City of San Diego (City) for the year ended June 30, 2010.

As described in Note 1 to the Schedule, the Schedule was prepared in conformity with the accounting practices prescribed by the Regional Wastewater Disposal Agreement between the City and the participating agencies in the Metropolitan Sewerage System dated May 18, 1998 and amendments dated May 15, 2000 and June 3, 2010 (Agreements), on a comprehensive basis of accounting other than accounting principles generally accepted in the United States of America. We are also responsible for adopting sound accounting policies, establishing and maintaining effective internal control over financial reporting related to the Schedule, and preventing and detecting fraud.

We confirm, to the best of our knowledge and belief, as of February 21, 2013, the following representations made to you during your audit of the Schedule for the year ended June 30, 2010:

- 1) The Schedule referred to above is fairly presented in conformity with the accounting practices prescribed by the Agreements between the City and the Participating Agencies, on a comprehensive basis of accounting other than generally accepted accounting principles in the United States of America.
- 2) We are responsible for selecting the criteria and for determining that such criteria are appropriate for our purposes.
- 3) We have made available to you all:
 - a. Financial records and related data.
 - b. Minutes of the meetings of the City Council or summaries of actions of recent meetings for which minutes have not yet been prepared.



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- 4) There have been no communications from regulatory agencies, internal auditors, and other independent practitioners or consultants concerning noncompliance with, or deficiencies in, financial reporting practices to Schedule of Allocation of Billing to Metropolitan Wastewater Utility, including communications received between June 30, 2010 and February 21, 2013.
- 5) There are no material transactions that have not been properly recorded in the accounting records underlying the Schedule.
- 6) There are no material uncorrected misstatements which we are individually aware of.
- 7) We acknowledge our responsibility for the design and implementation of programs and controls to prevent and detect fraud.
- 8) We have no individual knowledge of any fraud or suspected fraud that could affect the Schedule involving:
 - a. Management,
 - b. Employees who have significant roles in internal control, or
 - c. Others where the fraud could have a material effect on the Schedule.
- 9) We have no individual knowledge of any allegations of fraud or suspected fraud which affects the Schedule received in communications from employees, former employees, analysts, regulators, or others. (as to items 7, 8, and 9 we understand the term "fraud" to mean those matters described in Statement of Auditing Standards No. 99).
- 10) We have a process to track the status of audit findings and recommendations.
- 11) We have provided our views on the reported findings and recommendations, as well as our planned corrective action.
- 12) Accounting estimates that could be material to the Schedule. We believe the estimates and measurements are reasonable in the circumstances and consistently applied.
- 13) We are responsible for compliance with the laws, regulations, and provisions of contracts and grant agreements applicable to us, including tax or debt limits and debt contracts; and we have identified and disclosed to you all laws, regulations and provisions of contracts and grant agreements that we believe have a direct and material effect on the determination of Schedule amounts, including legal and contractual provisions for reporting specific activities in separate funds.

14) There are no:

- a. Violations or possible violations of budget ordinances, laws and regulations (including those pertaining to adopting, approving, and amending budgets), provisions of contracts and grant agreements, tax or debt limits, and any related debt covenants whose effects should be considered for disclosure in the Schedule, or as a basis for recording a loss contingency, or for reporting on noncompliance.
- b. We are not aware of any pending or threatened litigation, claims, or assessments or unasserted claims or assessments that are required to be disclosed in the Schedule in accordance with *Financial Accounting Standards Board (FASB) Statement No. 5*, and we have not consulted a lawyer concerning litigation, claims, or assessments that impact the Schedule.
- c. Other liabilities or gain or loss contingencies that are required to be accrued or disclosed by FASB Statement No. 5.

15) As part of your audit, you assisted with preparation of the draft Schedule and related notes. We have designated an individual with suitable skill, knowledge, or experience to oversee your services and have made all management decisions and performed all management functions. We have reviewed, approved, and accepted responsibility for the Schedule and the related notes.

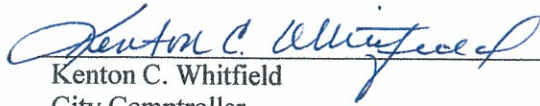
16) The PUD has complied with all aspects of contractual agreements that would have a material effect on the Schedule in the event of noncompliance.

17) We have followed all applicable laws and regulations in adopting, approving, and amending budgets.

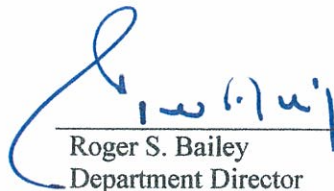
18) Expenses have been appropriately classified in the Schedule, and allocations of shared expenses between Metro and Muni have been made on a reasonable basis.

19) Revenues are appropriately classified in the Schedule.

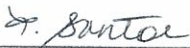
20) No events, including instances of noncompliance, have occurred subsequent to the Schedule date and through the date of this letter that would require adjustment to or disclosure in the aforementioned Schedule.



Kenton C. Whitfield
City Comptroller
City of San Diego



Roger S. Bailey
Department Director
Public Utilities Department
City of San Diego



Lee Ann Jones-Santos
Deputy Director
Finance and Information Technology
Public Utilities Department
City of San Diego



Susan LaNier
Deputy Director
Employee Services and Quality Assurance
Public Utilities Department
City of San Diego

WITHOUT PADRE DAM ADJUSTMENT

TABLE A

CITY OF SAN DIEGO - METROPOLITAN WASTEWATER DEPARTMENT
FISCAL YEAR 2010 ESTIMATED UNIT COSTS
FUNCTIONAL-DESIGN COST ALLOCATION METHOD
WITHOUT PADRE DAM ADJUSTMENT

TREATMENT PARAMETER	FY 2010 BUDGET	UNITS	COST PER UNIT
WASTEWATER FLOW	AMOUNT \$89,106,584	66,745 (a)	\$1,335.03 /per Million Gallons
SUSPENDED SOLIDS	\$50,104,866	165,429 (b)	\$302.88 /per Thousand Pounds
CHEMICAL OXYGEN DEMAND	\$44,459,554	314,169 (c)	\$141.51 /per Thousand Pounds
TOTAL	\$183,671,004	100%	

- (a) Units of Flow - Million Gallons Per Year
(b) Units of SS - Thousands of Pounds per Year
(c) Units of COD - Thousands of Pounds per Year

TABLE C

CITY OF SAN DIEGO - METROPOLITAN WASTEWATER DEPARTMENT
SYSTEM WASTEWATER CHARACTERISTICS - FISCAL YEAR 2010
SYSTEM STRENGTH LOADINGS INCLUDED
WITHOUT PADRE DAM ADJUSTMENT

AGENCY	WASTEWATER CHARACTERISTICS			UNADJUSTED ANNUAL USE				ADJUSTED ANNUAL USE			
	AVERAGE FLOW - mgd (a)	SS mg/l (b)	COD mg/l (b)	2010 FLOWS million gallons	SS thousand pounds	COD thousand pounds	2010 FLOWS million gallons	Flow Difference (c)	FY 2010 Billing Flows	SS thousand pounds	COD thousand pounds
CHULA VISTA	16.225	210	624	5,922.041	10,364	30,843	6,827.127	6.893	6,633.819	16,184	31,647
CORONADO	1.669	138	476	609.358	701	2,418	681.909	0.889	682.598	1,095	2,481
DEL MAR	0.567	240	586	206.884	415	1,012	231.516	0.234	231.750	647	1,038
EAST OTAY MESA	0.037	7	95	13.596	1	11	15.215	0.015	15.230	1	11
EL CAJON	7.430	158	493	2,711.885	3,572	11,182	3,034.765	3.065	3,037.830	5,579	11,453
IMPERIAL BEACH	2.276	193	519	830.565	1,336	3,596	929.453	0.939	930.392	2,087	3,690
LA MESA	4.824	169	478	1,760.676	2,486	7,027	1,970.304	1.990	1,972.294	3,882	7,210
LAKESIDE/ALPINE	2.992	170	468	1,088.382	1,541	4,255	1,217.966	1.230	1,219.196	2,407	4,368
LEMON GROVE	2.160	161	531	788.343	1,062	3,495	882.204	0.891	883.095	1,858	3,586
NATIONAL CITY	4.362	190	607	1,592.218	2,522	8,069	1,781.790	1.799	1,783.589	3,938	8,279
OTAY	0.378	996	1,302	138.070	1,148	1,500	154.509	0.156	154.665	1,792	1,539
PADRE DAM	2.433	539	936	888.167	3,995	6,950	993.914	1.004	994.917	6,238	7,131
POWAY	3.166	192	480	1,155.731	1,851	4,632	1,293.334	1.306	1,294.640	2,890	4,752
SPRING VALLEY	6.744	193	503	2,461.483	3,954	10,336	2,754.550	2.782	2,757.332	6,175	10,605
WINTERGARDENS	0.923	148	397	336.906	416	1,117	377.019	0.381	377.399	650	1,146
SUBTOTAL PARTICIPATING AGENCIES	56.176	207	564	20,504.305	35,363	96,423	22,945.574	23.172	22,968.746	55,222	98,934
SAN DIEGO	107.067	220	650	39,079.323	71,893	211,949	43,732.157	44.164	43,776.321	112,265	217,469
REGIONAL SLUDGE RETURNS	19.436	240	212	7,094.104	14,227	12,572					
FLOW DIFFERENCE	0.184			67.336	46,003	(4,541)					
TOTAL	182.863	297	564	66,745.068	165,429	314,169	66,677.732	67.336	66,745.068	167,487	316,403

(a) Flows based on metered, housecounts and inter-agency flow, adjustment to City of San Diego flow for centrate from MBC reduction of 2.4932 * 365 days

(b) SS and COD characteristics based on standard deviation cumulative samples taken by MWWD's Environmental Monitoring and Technical Services Division up to 06-30-10. Except for East Otay Mesa.

WITHOUT PADRE DAM ADJUSTMENT

FY 2010 AGENCY	expressed in percents:		
	FLOW	SUSPENDED SOLIDS	OXYGEN DEMAND
CHULA VISTA/MONTGOMERY	9.94%	9.66%	10.00%
CORONADO	1.02%	0.65%	0.78%
DEL MAR	0.35%	0.39%	0.33%
EAST OTAY MESA	0.02%	0.00%	0.00%
EL CAJON	4.55%	3.33%	3.62%
IMPERIAL BEACH	1.39%	1.25%	1.17%
LA MESA	2.95%	2.32%	2.28%
LAKESIDE/ALPINE	1.83%	1.44%	1.38%
LEMON GROVE	1.32%	0.99%	1.13%
NATIONAL CITY	2.67%	2.35%	2.62%
OTAY	0.23%	1.07%	0.49%
PADRE DAM	1.49%	3.72%	2.25%
POWAY	1.94%	1.73%	1.50%
SPRING VALLEY	4.13%	3.69%	3.35%
WINTERGARDENS	0.57%	0.39%	0.36%
SUBTOTAL PARTICIPATING AGENCIES	34.41%	32.97%	31.27%
SAN DIEGO	65.59%	67.03%	68.73%
TOTAL	100.00%	100.00%	100.00%

TABLE B

CITY OF SAN DIEGO - METROPOLITAN WASTEWATER DEPARTMENT
PROJECTED DISTRIBUTION OF SYSTEM WASTEWATER COSTS - FISCAL YEAR 2010
FUNCTIONAL-DESIGN BASED ALLOCATION METHOD
WITHOUT PADRE DAM ADJUSTMENT

AGENCY	ALLOCATION OF COSTS BY FLOW, SUSPENDED SOLIDS AND CHEMICAL OXYGEN DEMAND				TOTAL FLOW, SS & COD	TOTAL PAID FOR FY 2010	DIFFERENCE	% OF TOTAL
	FLOW (a)	SS (a)	COD (a)					
CHULA VISTA	\$8,856,339	\$4,841,438	\$4,446,843		\$18,144,620	\$18,395,320	(\$250,700)	29.70%
CORONADO	911,288	327,533	348,635		1,587,456	\$2,256,684	(\$669,228)	2.60%
DEL MAR	309,393	193,673	145,894		648,960	\$730,352	(\$81,392)	1.06%
EAST OTAY MESA	20,333	350	1,557		22,240	\$41,316	(\$19,076)	0.04%
EL CAJON	4,055,590	1,668,861	1,609,282		7,333,733	\$8,315,260	(\$981,527)	12.01%
IMPERIAL BEACH	1,242,100	624,261	518,449		2,384,810	\$2,221,256	\$163,554	3.90%
LA MESA	2,633,069	1,161,177	1,013,183		4,807,429	\$4,862,096	(\$54,667)	7.87%
LAKESIDE/ALPINE	1,627,662	720,056	613,445		2,961,163	\$3,166,232	(\$205,069)	4.85%
LEMON GROVE	1,178,957	495,981	503,931		2,178,869	\$2,179,968	(\$1,099)	3.57%
NATIONAL CITY	2,381,143	1,178,173	1,163,368		4,722,684	\$5,026,448	(\$303,764)	7.73%
OTAY	206,482	536,164	216,262		958,908	\$981,112	(\$22,204)	1.57%
PADRE DAM	1,328,243	1,866,033	1,002,021		4,196,297	\$6,302,500	(\$2,106,203)	6.87%
POWAY	1,728,382	864,533	667,748		3,260,663	\$3,048,904	\$211,759	5.34%
SPRING VALLEY	3,681,117	1,847,193	1,490,154		7,018,464	\$6,143,768	\$874,696	11.49%
WINTERGARDENS	503,839	194,474	161,014		859,327	\$816,192	\$43,135	1.41%
SUBTOTAL PARTICIPATING AGENCIES	\$30,663,937	\$16,519,900	\$13,901,786		\$61,085,623	\$64,487,408	(\$3,401,785)	
SAN DIEGO	\$58,442,647	\$33,584,965	\$30,557,769		\$122,585,381			
TOTAL	\$89,106,584	\$50,104,865	\$44,459,555		\$183,671,004			

TABLE D
CITY OF SAN DIEGO - METROPOLITAN WASTEWATER DEPARTMENT
ALLOCATION OF FISCAL YEAR 2010 ESTIMATED BUDGET
FUNCTIONAL-DESIGN BASED ALLOCATION METHOD
WITHOUT PADRE DAM ADJUSTMENT

DESCRIPTION	FY 2010 ACTUAL COSTS	ALLOCATION OF COSTS						
		FLOW %	FLOW COSTS	SS %	SS COSTS	COD %	COD COSTS	TOTAL COSTS
<u>OPERATION AND MAINTENANCE :</u>								
TRANSMISSION AND SYSTEM MAINTENANCE	\$10,896,091	100.0%	\$10,896,091	0.0%	\$0	0.0%	\$0	\$10,896,091
OPERATIONS & MAINTENANCE	54,562,685	36.4%	19,855,320	34.2%	18,669,428	29.4%	16,037,937	54,562,685
TECHNICAL SERVICES	10,607,762	30.0%	3,182,329	40.0%	4,243,105	30.0%	3,182,329	10,607,762
COGENERATION	307,791	0.0%	0	60.0%	184,675	40.0%	123,116	307,791
METRO ADMIN & GENERAL EXPENSES - 41508	25,817,416	44.4%	11,470,889	30.2%	7,807,731	25.3%	6,538,796	25,817,416
METRO ADMIN & GENERAL EXPENSES - 41509	15,480,983	44.4%	6,878,327	30.2%	4,681,776	25.3%	3,920,880	15,480,983
TOTAL OPERATIONS AND MAINTENANCE	\$117,672,727	44.43%	\$52,282,956	30.24%	\$35,586,714	25.33%	\$29,803,057	\$117,672,727
<u>CAPITAL IMPROVEMENT PROGRAM :</u>								
PAY-AS-YOU-GO METRO 41508	737,326	55.8%	411,390	22.0%	162,195	22.2%	163,741	737,326
PAY-AS-YOU-GO METRO 41509	753,278	55.8%	420,280	22.0%	165,704	22.2%	167,283	753,277
DEBT SERVICE	64,507,673	55.8%	35,991,948	22.0%	14,190,253	22.2%	14,325,473	64,507,674
TOTAL CAPITAL IMPROVEMENT PROGRAM	\$65,998,277	55.8%	\$36,823,628	22.0%	\$14,518,152	22.2%	\$14,656,497	\$65,998,277
TOTAL O&M & CAPITAL IMPROVEMENT PROGRAM	\$183,671,004	48.51%	\$89,106,584	27.28%	\$50,104,866	24.21%	\$44,459,554	\$183,671,004

TABLE D
CITY OF SAN DIEGO - METROPOLITAN WASTEWATER DEPARTMENT
ALLOCATION OF FISCAL YEAR 2010 ESTIMATED BUDGET
FUNCTIONAL-DESIGN BASED ALLOCATION METHOD
WITHOUT PADRE DAM ADJUSTMENT

DESCRIPTION	FY 2010 ACTUAL COSTS	ALLOCATION OF COSTS						
		FLOW %	FLOW COSTS	SS %	SS COSTS	COD %	COD COSTS	TOTAL COSTS
<u>OPERATION AND MAINTENANCE :</u>								
TRANSMISSION AND SYSTEM MAINTENANCE	\$10,896,091	100.0%	\$10,896,091	0.0%	\$0	0.0%	\$0	\$10,896,091
OPERATIONS & MAINTENANCE	54,562,685	36.4%	19,855,320	34.2%	18,669,428	29.4%	16,037,937	54,562,685
TECHNICAL SERVICES	10,607,762	30.0%	3,182,329	40.0%	4,243,105	30.0%	3,182,329	10,607,762
COGENERATION	307,791	0.0%	0	60.0%	184,675	40.0%	123,116	307,791
METRO ADMIN & GENERAL EXPENSES - 41508	25,817,416	44.4%	11,470,889	30.2%	7,807,731	25.3%	6,538,796	25,817,416
METRO ADMIN & GENERAL EXPENSES - 41509	15,480,983	44.4%	6,878,327	30.2%	4,681,776	25.3%	3,920,880	15,480,983
TOTAL OPERATIONS AND MAINTENANCE	\$117,672,727	44.43%	\$52,282,956	30.24%	\$35,586,714	25.33%	\$29,803,057	\$117,672,727
<u>CAPITAL IMPROVEMENT PROGRAM:</u>								
PAY-AS-YOU-GO METRO 41508	737,326	55.8%	411,390	22.0%	162,195	22.2%	163,741	737,326
PAY-AS-YOU-GO METRO 41509	753,278	55.8%	420,290	22.0%	165,704	22.2%	167,283	753,277
DEBT SERVICE	64,507,673	55.8%	35,991,948	22.0%	14,190,253	22.2%	14,325,473	64,507,674
TOTAL CAPITAL IMPROVEMENT PROGRAM	\$65,998,277	55.8%	\$36,823,628	22.0%	\$14,518,152	22.2%	\$14,656,497	\$65,998,277
TOTAL O&M & CAPITAL IMPROVEMENT PROGRA	\$183,671,004	48.51%	\$89,106,584	27.28%	\$50,104,866	24.21%	\$44,459,554	\$183,671,004

WITH PADRE DAM ADJUSTMENT

TABLE A

CITY OF SAN DIEGO - METROPOLITAN WASTEWATER DEPARTMENT
FISCAL YEAR 2010 ESTIMATED UNIT COSTS
FUNCTIONAL-DESIGN COST ALLOCATION METHOD
WITH PADRE DAM ADJUSTMENT

TREATMENT PARAMETER	FY 2010 BUDGET	UNITS	COST PER UNIT
WASTEWATER FLOW	AMOUNT \$89,106,584	66,745 (a)	\$1,335.03 /per Million Gallons
SUSPENDED SOLIDS	\$50,104,866	165,429 (b)	\$302.88 /per Thousand Pounds
CHEMICAL OXYGEN DEMAND	\$44,459,554	314,169 (c)	\$141.51 /per Thousand Pounds
TOTAL	\$183,671,004	100%	

(a) Units of Flow - Million Gallons Per Year

(b) Units of SS - Thousands of Pounds per Year

(c) Units of COD - Thousands of Pounds per Year

TABLE C

CITY OF SAN DIEGO - METROPOLITAN WASTEWATER DEPARTMENT
SYSTEM WASTEWATER CHARACTERISTICS - FISCAL YEAR 2010
SYSTEM STRENGTH LOADINGS INCLUDED
WITH PADRE DAM ADJUSTMENT

	WASTEWATER CHARACTERISTICS			UNADJUSTED ANNUAL USE			ADJUSTED ANNUAL USE				
AGENCY	AVERAGE FLOW - mgd (a)	SS mg/l (b)	COD mg/l (b)	2010 FLOWS million gallons	SS thousand pounds	COD thousand pounds	2010 FLOWS million gallons	Flow Difference (c)	FY 2010 Billing Flows	SS thousand pounds	COD thousand pounds
CHULA VISTA	16.225	210	624	5,922.041	10,364	30,843	6,627.127	6.693	6,633.819	16,297	31,653
CORONADO	1.669	138	476	609.358	701	2,418	681.909	0.669	682.598	1,103	2,482
DEL MAR	0.567	240	586	206.884	415	1,012	231.516	0.234	231.750	652	1,038
EAST OTAY MESA	0.037	7	95	13.596	1	11	15.215	0.015	15.230	1	11
EL CAJON	7.430	158	493	2,711.885	3,572	11,162	3,034.765	3.065	3,037.830	5,618	11,455
IMPERIAL BEACH	2.276	193	519	830.565	1,336	3,596	929.453	0.939	930.392	2,101	3,690
LA MESA	4.824	169	478	1,760.676	2,486	7,027	1,970.304	1.990	1,972.294	3,909	7,212
LAKESIDE/ALPINE	2.982	170	468	1,088.382	1,541	4,255	1,217.966	1.230	1,219.196	2,424	4,366
LEMON GROVE	2.160	161	531	788.343	1,062	3,495	882.204	0.891	883.095	1,670	3,587
NATIONAL CITY	4.362	190	607	1,592.218	2,522	8,069	1,761.760	1.799	1,783.589	3,966	8,281
OTAY	0.378	996	1,302	138.070	1,148	1,500	154.509	0.156	154.665	1,805	1,539
PADRE DAM	2.433	261	636	888.167	1,937	4,716	993.914	1.004	994.917	3,045	4,840
POWAY	3.166	192	460	1,155.731	1,851	4,632	1,293.334	1.306	1,294.640	2,910	4,753
SPRING VALLEY	6.744	193	503	2,461.483	3,954	10,336	2,754.550	2.782	2,757.332	6,218	10,607
WINTERGARDENS	0.923	148	397	336.906	416	1,117	377.019	0.381	377.399	655	1,146
SUBTOTAL PARTICIPATING AGENCIES	56.176	195	550	20,504.305	33,305	94,189	22,945.574	23.172	22,968.746	52,374	96,660
SAN DIEGO	107.067	220	650	39,079.323	71,893	211,949	43,732.157	44.164	43,776.321	113,055	217,509
REGIONAL SLUDGE RETURNS	19.436	240	212	7,094.104	14,227	12,572					
FLOW DIFFERENCE	0.184			67.336	46,003	(4,541)					
TOTAL	182.863	297	564	66,745.068	165,429	314,169	66,677.732	67.336	66,745.068	165,429	314,169

(a) Flows based on metered, housecounts and inter-agency flow, adjustment to City of San Diego flow for centrate from MBC reduction of 2.4932 * 365 days

(b) SS and COD characteristics based on standard deviation cumulative samples taken by MWWD's Environmental Monitoring and Technical Services Division, up to 06-30-10. Except for East Otay Mesa.

WITH PADRE DAM ADJUSTMENT

expressed in percents:

FY 2010 AGENCY	FLOW	SUSPENDED SOLIDS	OXYGEN DEMAND
CHULA VISTA/MONTGOMERY	9.94%	9.85%	10.07%
CORONADO	1.02%	0.67%	0.79%
DEL MAR	0.35%	0.39%	0.33%
EAST OTAY MESA	0.02%	0.00%	0.00%
EL CAJON	4.55%	3.40%	3.65%
IMPERIAL BEACH	1.39%	1.27%	1.17%
LA MESA	2.95%	2.36%	2.30%
LAKESIDE/ALPINE	1.83%	1.47%	1.39%
LEMON GROVE	1.32%	1.01%	1.14%
NATIONAL CITY	2.67%	2.40%	2.64%
OTAY	0.23%	1.09%	0.49%
PADRE DAM	1.49%	1.84%	1.54%
POWAY	1.94%	1.76%	1.51%
SPRING VALLEY	4.13%	3.76%	3.38%
WINTERGARDENS	0.57%	0.40%	0.36%
SUBTOTAL PARTICIPATING AGENCIES	34.41%	31.66%	30.77%
SAN DIEGO	65.59%	68.34%	69.23%
TOTAL	100.00%	100.00%	100.00%
Participating Agencies Ave.	32.28%		
San Diego Ave.	67.72%		
Total	100.00%		

TABLE B

CITY OF SAN DIEGO - METROPOLITAN WASTEWATER DEPARTMENT
 PROJECTED DISTRIBUTION OF SYSTEM WASTEWATER COSTS - FISCAL YEAR 2010
 FUNCTIONAL-DESIGN BASED ALLOCATION METHOD
 WITH PADRE DAM ADJUSTMENT

AGENCY	ALLOCATION OF COSTS BY FLOW, SUSPENDED SOLIDS AND CHEMICAL OXYGEN DEMAND				TOTAL PAID FOR FY 2010	DIFFERENCE	OPERATING RESERVE	TOTAL FOR FY 2010	% OF TOTAL
	FLOW (a)	SS (a)	COD (a)	TOTAL FLOW SS & COD					
CHULA VISTA	\$8,856,339	\$4,936,143	\$4,479,296	\$18,271,778	\$18,395,320	(\$123,542)	\$109,613	(\$13,928)	30.35%
CORONADO	911,288	333,940	351,180	1,596,408	\$2,256,684	(\$660,276)	\$9,577	(\$650,699)	2.65%
DEL MAR	308,393	197,462	146,959	653,814	\$730,352	(\$76,538)	\$3,922	(\$72,616)	1.09%
EAST OTAY MESA	20,333	357	1,569	22,259	\$41,316	(\$19,057)	\$134	(\$18,923)	0.04%
EL CAJON	4,055,590	1,701,507	1,621,027	7,378,124	\$8,315,260	(\$937,136)	\$44,261	(\$892,875)	12.25%
IMPERIAL BEACH	1,242,100	636,472	522,232	2,400,804	\$2,221,256	\$179,548	\$14,402	\$193,950	3.99%
LA MESA	2,633,069	1,183,892	1,020,577	4,837,538	\$4,862,096	(\$24,558)	\$29,020	\$4,462	8.04%
LAKESIDE/ALPINE	1,627,662	734,141	617,922	2,979,725	\$3,166,232	(\$186,507)	\$17,875	(\$168,632)	4.95%
LEMON GROVE	1,178,957	505,683	507,609	2,192,249	\$2,179,988	\$12,261	\$13,151	\$25,432	3.64%
NATIONAL CITY	2,381,143	1,201,220	1,171,858	4,754,221	\$5,026,448	(\$272,227)	\$28,521	(\$243,706)	7.90%
OTAY	206,482	546,652	217,840	970,974	\$981,112	(\$10,138)	\$5,825	(\$4,313)	1.61%
PADRE DAM	1,328,243	922,413	684,866	2,935,522	\$6,302,500	(\$3,366,978)	\$17,610	(\$3,349,368)	4.98%
POWAY	1,728,382	881,444	672,621	3,282,447	\$3,048,904	\$233,543	\$19,691	\$253,234	5.45%
SPRING VALLEY	3,681,117	1,883,327	1,501,030	7,065,474	\$6,143,768	\$921,706	\$42,386	\$964,092	11.74%
WINTERGARDENS	503,839	198,279	162,189	864,307	\$816,192	\$48,115	\$5,185	\$53,300	1.44%
SUBTOTAL PARTICIPATING AGENCIES	\$30,663,937	\$15,862,932	\$13,678,775	\$60,205,644	\$64,487,408	(\$4,281,764)	\$361,175	(\$3,920,589)	
SAN DIEGO	\$58,442,647	\$34,241,935	\$30,780,780	\$123,465,362					
TOTAL	\$89,106,584	\$50,104,867	\$44,459,555	\$183,671,006					

(a) Allocations based on estimated annual flows and strength loadings - See Table C

CITY OF SAN DIEGO - METROPOLITAN WASTEWATER DEPARTMENT
ALLOCATION OF FISCAL YEAR 2010 ESTIMATED BUDGET
FUNCTIONAL-DESIGN BASED ALLOCATION METHOD
WITH PADRE DAM ADJUSTMENT

DESCRIPTION	FY 2010 ACTUAL COSTS	ALLOCATION OF COSTS						
		FLOW %	FLOW COSTS	SS %	SS COSTS	COD %	COD COSTS	TOTAL COSTS
OPERATION AND MAINTENANCE :								
TRANSMISSION AND SYSTEM MAINTENANCE	\$10,896,091	100.00%	\$10,896,091	0.00%	\$0	0.00%	\$0	\$10,896,091
OPERATIONS & MAINTENANCE	54,562,685	36.39%	19,855,320	34.22%	18,669,428	29.39%	16,037,937	54,562,685
TECHNICAL SERVICES	10,607,762	30.00%	3,182,329	40.00%	4,243,105	30.00%	3,182,329	10,607,762
COGENERATION	307,791	0.00%	0	60.00%	184,675	40.00%	123,116	307,791
METRO ADMIN & GENERAL EXPENSES - 41508	25,817,416	44.43%	11,470,889	30.24%	7,807,731	25.33%	6,538,796	25,817,416
METRO ADMIN & GENERAL EXPENSES - 41509	15,480,983	44.43%	6,878,327	30.24%	4,681,776	25.33%	3,920,880	15,480,983
TOTAL OPERATIONS AND MAINTENANCE	\$117,672,727	44.43%	\$52,282,956	30.24%	\$35,586,714	25.33%	\$29,803,057	\$117,672,727
CAPITAL IMPROVEMENT PROGRAM:								
PAY-AS-YOU-GO METRO 41508	737,326	55.8%	411,390	22.0%	162,195	22.2%	163,741	737,326
PAY-AS-YOU-GO METRO 41509	753,278	55.795%	420,290	21.998%	165,704	22.2%	167,283	753,277
DEBT SERVICE	64,507,673	55.795%	35,991,948	21.998%	14,190,253	22.21%	14,325,473	64,507,674
TOTAL CAPITAL IMPROVEMENT PROGRAM	\$65,998,277	55.8%	\$36,823,628	22.0%	\$14,518,152	22.2%	\$14,656,497	\$65,998,277
TOTAL O&M & CAPITAL IMPROVEMENT PROGRAM								
TOTAL O&M & CAPITAL IMPROVEMENT PROGRAM		48.51%	\$89,106,584	27.28%	\$50,104,866	24.21%	\$44,459,554	\$183,671,004

TABLE 4-1A
METROPOLITAN WASTEWATER DEPARTMENT
FY 2010 ESTIMATED OPERATIONS & MAINTENANCE BUDGET
FUNCTIONAL-DESIGN BASED ALLOCATION METHOD
WITH PADRE DAM ADJUSTMENT

FUND#	TITLE	% ALLOC
	TOTAL TRANSMISSION & SYSTEM MAINT	
41508	METRO PUMP STATION #1 - OPS & MAINT	100%
41508	METRO PUMP STATION #2 - OPS & MAINT	100%
	OPERATIONS & MAINT	
41508	POINT LOMA PLANT - OPS & MAINT	100%
41508	NORTH CITY WATER REC PLANT	100%
41508	METRO BIOSOLIDS CENTER	100%
41508	SOUTH BAY WATER REC. PLANT (Includes GAPS)	100%
	TECHNICAL SERVICES	
41508	WASTEWATER CHEMISTRY	100%
41508	BIOLOGY/OCEAN OPERATIONS	100%
	COGENERATION	
41508	POINT LOMA COGEN. - OPS & MAINT	100%
41508	HYDRO ELECTRIC GEN. - OPS & MAINT	100%
41508	COGENERATION PRODUCTION SOLD	100%
	TOTAL DIRECT COSTS	
	ADMINISTRATION AND GENERAL EXPENSE	
41508	METRO ADMINISTRATION & ENGINEERING	100%
41508	PERMITS & COMPLIANCE	100%
41508	TECHNICAL SERVICES ADMINISTRATION	100%
41508	SEWAGE TESTING AND CONTROL	100%
41508	COMC CENTRAL SUPPORT FACILITY	100%
41508	FACILITIES MAINTENANCE MANAGEMENT	100%
	METRO GENERAL & ADMIN SUBTOTAL	
41509	CLEAN WATER PROGRAM ADMIN	100%
	METRO AND CLEAN WATER ADMIN TOTAL	
	GRAND TOTAL - OPERATIONS	

\$ AMOUNT		FLOW COSTS		SS COSTS		COD COSTS	
	%		%		%		%
3,282,614	100.0%	3,282,614	0.0%	0	0.0%	0	0.0%
7,613,477	100.0%	7,613,477	0.0%	0	0.0%	0	0.0%
10,896,091	100.0%	10,896,091	0.0%	0	0.0%	0	0.0%
22,818,341	35.0%	7,986,419	40.0%	9,127,336	25.0%	5,704,585	25.0%
9,016,846	75.0%	6,762,635	10.0%	901,685	15.0%	1,352,527	15.0%
15,919,143	0.0%	0	50.0%	7,959,572	50.0%	7,959,572	50.0%
6,808,355	75.0%	5,106,266	10.0%	680,836	15.0%	1,021,253	15.0%
54,562,685	36.4%	19,855,320	34.2%	18,669,428	29.4%	16,037,937	29.4%
5,915,069	30.0%	1,774,521	40.0%	2,366,028	30.0%	1,774,521	30.0%
4,692,693	30.0%	1,407,808	40.0%	1,877,077	30.0%	1,407,808	30.0%
10,607,762	30.0%	3,182,329	40.0%	4,243,105	30.0%	3,182,329	30.0%
1,259,233	0.0%	0	60.0%	755,540	40.0%	503,693	40.0%
0	100.0%	0	0.0%	0	0.0%	0	0.0%
(951,441)	0.0%	0	60.0%	(570,865)	40.0%	(380,577)	40.0%
307,791	0.0%	0	60.0%	184,675	40.0%	123,116	40.0%
76,374,329	44.4308%	33,933,740	30.24%	23,097,207	25.33%	19,343,382	25.33%
17,010,254	44.4%	7,557,795	30.2%	5,144,259	25.3%	4,308,199	25.3%
	44.4%	0	30.2%	0	25.3%	0	25.3%
4,142,617	44.4%	1,840,599	30.2%	1,252,815	25.3%	1,049,204	25.3%
293,386	44.4%	130,354	30.2%	88,726	25.3%	74,306	25.3%
4,371,159	44.4%	1,942,142	30.2%	1,321,931	25.3%	1,107,087	25.3%
	44.4%	0	30.2%	0	25.3%	0	25.3%
25,817,416	44.4%	11,470,889	30.2%	7,807,731	25.3%	6,538,796	25.3%
15,480,983	44.4%	6,878,327	30.2%	4,681,776	25.3%	3,920,880	25.3%
41,298,398	44.4%	18,349,216	30.2%	12,489,506	25.3%	10,459,675	25.3%
\$117,672,727	44.4%	\$52,282,956	30.2%	\$35,586,714	25.3%	\$29,803,057	25.3%

AGENDA ITEM 5

Attachment



Technical Memorandum

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Prepared for: City of San Diego, Public Utilities Department
Project Title: Metro Strength Based-Billing Evaluation
Project No: 142685

Technical Memorandum - DRAFT

Subject: Metro Strength Based-Billing Evaluation

Date: February 15, 2013

To: Mike Faramarzi

From: Seval Sen, Project Manager

Copy to: Victor Occiano, Brown and Caldwell

Prepared by: _____

Seval Sen, Project Engineer, CA 70565, Exp. 06/30/13

Reviewed by: _____

Victor Occiano, As-Needed Contract Manager/Vice President

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Limitations:

This is a draft memorandum and is not intended to be a final representation of the work done or recommendations made by Brown and Caldwell. It should not be relied upon; consult the final memorandum.

This document was prepared solely for the City of San Diego in accordance with professional standards at the time the services were performed and in accordance with the Agreement for As Needed Engineering Services 2008 – 2013, Task Order No. 49 (H074040) between the City of San Diego and Brown and Caldwell dated May 16, 2008. This document is governed by the specific scope of work authorized by the City of San Diego; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by the City of San Diego and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

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List of Abbreviations

ADS	ADS Services Inc.	PUD	Public Utilities Department
ASSSC	Amalgamated System Sewer Service Charge	RWCWRF	Ralph W. Chapman Water Recycling Facility
BC	Brown and Caldwell	SD	Sanitation District
BOD	biochemical oxygen demand	SM	Standard Method
cfs	cubic feet per second	SSC	sewer service charge
COD	chemical oxygen demand	SVTS	Spring Valley Trunk Sewer
City	City of San Diego	TM	technical memorandum
Contract Agencies	surrounding communities and agencies	TSS	total suspended solids
EDU	equivalent dwelling unit	UGR	unit generation rate
FY	fiscal year	WAS	waste activated sludge
gpd	gallon per day	WD	Water District
I&I	infiltration and inflow	WRF	Water Reclamation Facility
IPS	Influent Pump Station	WRP	Water Reclamation Plant
IRWD	Irvine Ranch Water District		
IWL	Industrial Waste Laboratory		
LA	Los Angeles		
lb	pound		
lb/day	pounds per day		
MBC	Metropolitan Biosolids Center		
Metro JPA	Metropolitan Joint Powers Authority		
Metro System	Metropolitan Sewerage System		
MG	million gallons		
mgd	million gallons per day		
mg/L	milligrams per liter		
MWD	municipal water district		
OCSD	Orange County Sanitation District		
PA	participating agency		
PS	pump station		

Executive Summary

The City of San Diego (City) Public Utilities Department (PUD) operates the Metropolitan Sewerage System (Metro System) which serves the City and 15 participating agencies (PA) outside of the City's jurisdiction. The City currently allocates the cost of operating and maintaining Metro System facilities (including administration and the costs associated with the annual capital improvement program) based on a methodology developed in the 1990s. The Metropolitan Joint Powers Authority (Metro JPA) member agencies agreed to allocate the cost of operating and maintaining the Metro System based on three wastewater components (flow, total suspended solids [TSS], and chemical oxidation demand [COD]) contributed to the system by each respective agency.

The PUD wishes to evaluate the strength-based billing methodology to ensure that costs are equitably distributed among participating agencies. The PUD's initial concerns about the methodology include:

1. A number of older samples included in the database and used in strength calculations may no longer be valid because of changing conditions; specifically water conservation.
2. Do the sampling locations and application of the resulting data appropriately represent the strength of flow from each agency?
3. There are two special conditions in the system where agencies treat wastewater and discharge the residual solids into the Metro System. The PUD wants the effects of these discharges evaluated to ensure the billing is equitable.

Brown and Caldwell was contracted by the City to evaluate the current strength-based billing methodology and make recommendations to ensure the billing of the participating agencies is equitable in relation to the value received from the Metro System. The scope of work is divided into five tasks:

- **Task 1 – Obtain and Review Historical Wastewater Flow and Strength Data.** The intent of this task was to thoroughly review the existing data to evaluate the impact of water conservation and system changes may have had on the flows and loads of the Metro System. Another objective of this task is to determine the appropriate averaging times for the historical wastewater strength data used for calculating the loading from each agency.
- **Task 2 – Review Practices in Similar Agencies.** The objective of this task is to report the billing methods practiced in similar agencies. The information gathered from this task could provide insight into the practices that have proven successful at other agencies.
- **Task 3 – Examine Each Participating Agency's Flow Measurement and Sampling Locations.** The objective of this task is to closely examine the sampling and metering locations and determine if data collected from these locations is equitable and truly representative of the contribution from each agency.
- **Task 4 – Examine Otay Water District, Padre Dam Municipal Water District and County of San Diego's Flow Measurement and Sampling Locations.** The objective of this task is to specifically focus on the first two agencies that have unique discharges to the Metro System. Review of the County of San Diego system is also performed since the sampling and flow monitoring location used to determine the County's contribution receives significant discharges from other PAs, including Otay Water District. Sampling and metering locations are examined and mass balance calculations are reviewed under this task.
- **Task 5 – Prepare Technical Memorandum.** The result of this task is this technical memorandum. This TM presents the findings, conclusions and recommendations of the evaluation.

Findings of the study conclusions and recommendations of the study is summarized in Table ES-1.

Table ES.1 Summary of Conclusions and Recommendations

Category	Findings/Conclusions	Recommendations
Flow Measurement Locations	Unmetered flow contribution is significant for some agencies.	For consistency, the City can continue to use its current criteria for installing flow meters in sewers where the flow reaches or surpasses 0.2 mgd (which is 750 EDU based on UGR of 265 gpd/EDU) to determine which area should be metered. Each affected PA should collaborate with the City in determining the appropriate metering location.
	The current Unit Generation Rate (UGR) value of 265 gpd/EDU applied to unmetered areas is appropriate for most areas. UGRs can differ between agencies, depending on the water conservation and general water use practices followed by neighborhoods and the tightness of the pipeline to prevent infiltration and inflow (I/I).	UGRs should be re-evaluated periodically to determine if currently applied values continue to be representative of the last 5 years. Confidence in flow calculations for unmetered areas can increase and it may eliminate the need to install costly metering locations. PA's could independently conduct studies to determine the appropriate UGRs specific to their service areas and seek an agreement with the City to use a different UGR value for unmetered flows in their area.
	The recycled water produced at the North City WRP and distributed to nearby City customers is not considered when determining City flows reaching sample location SD1B. In addition MBC centrate should be subtracted as it has been recently done since FY2010.	The recycled water produced at the North City WRP should be added to the San Diego flow determined for SD1B. The flow addition can be done at the end of the year in a same manner the MBC centrate flow deduction is made.
Sampling Locations	Lemon Grove. Due to recent changes in Lemon Grove sewer system, the current sampling location, LG1, represents 9% of the total agency flow; whereas, LG2, which is metered for flow but not sampled, makes up about 46% of the agency flow.	Collect wastewater samples at LG2 instead of LG1 to obtain data that are more representative of flows from Lemon Grove.
	San Diego. The City has 12 sampling locations throughout its main service area. SD11 and SD12 are among the current sampling locations and each represent only 0.6 and 0.2 % of the total City flow, respectively. Comparatively, no wastewater samples are collected from flow metering locations SD19 and SD2B where up to 13 and 3 percent, respectively, of approximately 110 mgd (FY 2011 flow) of the total City flow is passing. Two locations, SD11A and SD18 combined capture the flow of SD11 prior to flow diversion to South Bay Water Reclamation Plant in 2002. This is about 4 mgd or 3.5 percent of the total net City flow. Alternatively, SD11A and SD18 can be included in the monitoring program.	Unless there is a specific reason for these locations to not be sampled, data collected at locations SD19 and SD2B would produce more representative data for San Diego. It is recommended to discontinue monitoring at SD11 and SD12 if monitoring is established at SD19 and SD2B. SD11A and SD18 should be considered for sampling. This change would increase the total number of City-specific sampling locations to 14, but would provide a better representation of City flows. If the City wishes to stay with 12 sampling locations due to cost issues, then we recommend discontinuing sampling at SD2A or SD8 (both contribute only about 1 percent each of the total net City flow).
	National City. National City is mainly comprised of single and multiple family homes with some transport, industrial and commercial land uses. Location NC5, where wastewater samples are collected, represents approximately 19% of the net agency flow. But, the dominant land use type specific to this catchment area is transport. Sampling at a location where the dominant land use type is not residential is not considered a representative location for National City.	The City should consider collecting wastewater samples at NC3B. Wastewater passing through this location comprises about 16% of the total agency flow. In addition, the land use types within its catchment area better represents the majority of National City land uses. Sampling at both NC5 and NC3B is recommended to better represent the National City discharges.

Table ES.1 Summary of Conclusions and Recommendations

Category	Findings/Conclusions	Recommendations
Monitoring of Wastewater from Padre Dam MWD	The results of the short-term sampling and monitoring event conducted in October 2012 suggest that concurrent sampling and monitoring at LS2 and PD1B adequately captures waste streams from the Ray Stoyer WRF and bypass flows at the IPS. It was noted that average COD and TSS concentrations (889 and 433 mg/L, respectively) measured at PD1B during this sampling event were much higher than the historical average COD and TSS concentrations (590 and 236 mg/L, respectively) the City has been using for billing purposes. The difference is considered significant.	Concurrent monitoring of LS2 and PD1B should be performed (without the need to monitor at MSS) since the short-term sampling and monitoring performed under this project proved that LS2 and PD1B, when sampled and monitored concurrently, adequately represents discharges from the Padre Dam MWD. The best approach to capture the PD1B loads accurately would be to disregard the historical COD and TSS measurements at PD1B and start fresh. In order to form a baseline quickly, a more frequent (monthly or bi-monthly) sampling program can be instituted in the initial 2 years. After collecting about 24 data points, quarterly sampling can be reinstated to reduce cost.
	Wastewater strength determined at PD2 and at a manhole receiving discharges from Simeon Drive (as part of the 2010 Wastewater Characterization Study conducted by Padre Dam MWD) are about 20 and 30% lower than the COD and TSS concentrations used to represent Padre Dam MWD's wastewater strength in FY 2011 using data based on PD1B. Applying the calculated representative TSS and COD values for wastewater generated downstream of PD1B will result in over estimating loads from these areas.	It is recommended to collect samples at PD2 for wastewater characterization in addition to flow measurement. Limited number of sampling, e.g., 5 to 7 days) would be sufficient to characterize the wastewater since it is mainly from residential community. The concentrations found there could represent Cowles Mountain and the Padre Dam residential flows that go to PD2. This would eliminate the potential overestimation of the load from these locations by the current application of the concentrations found at PD1B.
Monitoring of Wastewater from Otay WD	Since 1993, Otay WD estimates the WAS TSS load in the RWCWRF based on plant influent flow according to a guideline found in a textbook. This method was preferred because the waste activated sludge discharge did not have to be analyzed for TSS. Today, Otay WD collects a daily grab of the WAS and analyzes for process control purposes.	Otay WD should report the TSS and BOD loadings associated with the WAS based on measured flow and TSS concentration. Otay WD indicated that future reports to the City will utilize measured values in determining loads.
	The current method of assuming BOD load in WAS is half of the TSS load may be conservative; actual BOD load may be less. In addition, the BOD of the screenings is assumed to be equal to its TSS content, which may also be an over estimation.	Otay WD should revise the current textbook-based equations being employed to estimate loadings using actual measured values. They could either continuously take samples of the sludge or perform a short-term sampling program (5 to 10 samples) and analyze it for BOD and TSS to arrive at a TSS to BOD ratio that can be confidently applied for estimating loads.
	Equations used in the current mass balance calculation spreadsheet are set assuming the RWCWRF is on-line all year-long. This setup causes erroneous calculation of the annual TSS and COD concentrations used for loading estimates when the plant is off-line.	BC recommends the City use the average RWCWRF influent concentrations for the days the plant is on-line as reported by the Otay WD, or revise the mass balance calculations to be based on yearly total flows and loads instead of yearly average values. This will eliminate any calculation errors due to plant off-line periods.

Table ES.1 Summary of Conclusions and Recommendations

Category	Findings/Conclusions	Recommendations
Monitoring of Wastewater from County of San Diego	Wastewater contribution from East Otay Mesa to the Metro System was minimal and had not been monitored until 2009. Wastewater TSS and COD concentrations are monitored at a sampling and metering location at the Otay Mesa Energy Center. Average COD and TSS concentrations reported here are used to represent the residential wastewater discharges from Easy Otay Mesa. These concentrations are significantly lower than the typical concentrations observed at other locations in the County with residential flows.	The plan is to re-initiate the sampling program at a more representative sampling location when the flows increase from East Otay Mesa. Meantime, it is suggested to use more representative COD and TSS concentrations for the residential discharges such as the average concentrations reported for Winter Gardens or Lakeside/Alpine.
	Spring Valley SD is neighbored by several agencies, including the cities of El Cajon, La Mesa, Lemon Grove, National City, Chula Vista, and San Diego, and the Otay WD. All the neighboring agencies, except City of El Cajon, discharge wastewater within the district boundaries which is eventually conveyed to the Metro System. Otay WD discharges both sludge and sewer flows bypassed at the RWCWRF and therefore considerably different than typical domestic wastewater. COD and TSS loads contributed by the Otay WD are subtracted from the Spring Valley SD loads. Other significant inter-agency flow contributors include the cities of Chula Vista and San Diego.	Land use types among Spring Valley, Chula Vista, and San Diego communities are not considered significantly different that additional sampling locations are necessary, but load calculations for Spring Valley SD could be refined with additional sampling. BO1 could be sampled to better define the characteristics of wastewater from San Diego while CV7 and another location such as CV10, CV12 or CV 9 could be sampled to characterize Chula Vista discharges.
Calculation of the Agency Representative Wastewater Strength Data	For agencies where the inter-agency loadings are expected to be significantly different in strength, loadings from the inter-agency flows are subtracted from the agency loadings. The representative COD and TSS concentrations are then calculated based on the net agency flow. Representative COD and TSS concentrations for Coronado, El Cajon, Padre Dam and Spring Valley are calculated based on this concept. Navy Base flows and loads are subtracted from Coronado flows and loads while Lakeside/Alpine and Winter Gardens (County of San Diego) flows and loads are subtracted from El Cajon and Padre Dam flows and loads, respectively. Similarly, Otay WD loads, including the waste solids from the RWCWRF, are subtracted from the Spring Valley loads.	Concurrent sampling and monitoring at the sampling locations for Navy Base and Coronado (C1M and C3); Lakeside/Alpine and Padre Dam (LS2 and PD1B); and Winter Gardens and El Cajon (WG1M and EC1) are strongly recommended to maintain direct correlation between data used for estimating the agency's contributions. Concurrent sampling for discharges to the Spring Valley trunk sewer can be challenging since there are many inter-agency discharges. However, the two major contributors are cities of San Diego and Chula Vista. As suggested earlier, wastewater characterization sampling at the San Diego metering location BO1, and at two Chula Vista metering locations (CV7 and one of either CV10, CV12, or CV9) can be implemented to better define the characteristics of wastewater from there agencies. When this happens, concurrent sampling at SV8, BO1, and the two Chula Vista sampling locations is recommended.
Sampling and Analysis Procedures	Analysis method SM 5220 for COD analysis state that blending (homogenization) is needed for samples containing suspended solids prior to conducting the test. Homogenization is an important sample preparation step to reduce variability in the analysis results. Currently the IWL does not follow the homogenization procedure, which might be contributing the variable analysis results.	It is recommended that IWL perform homogenization step prior to analysis for COD analysis.

Table ES.1 Summary of Conclusions and Recommendations

Category	Findings/Conclusions	Recommendations
Statistical Data Evaluation	Statistical analysis is performed on the concentrations, which is highly dependent on wastewater flow. Since loading is directly tied to billing, it should be used basis for the statistical analysis.	Since loading is directly tied to billing, it should be used as the basis for the statistical analysis.
	Although the criterion for acceptance is defined as 95% of the data, less data (as low as 85%) have been accepted for most data sets with the current method. The iterative process of reestablishing the upper and lower limits after rejection of outliers results in ever tighter bounds and large quantities of data are thrown out.	It is suggested not to follow the iterative process and base the statistical evaluation on the whole data set. It is found more reasonable to set the lower and upper boundaries for data rejection to 5% of the top and bottom of the whole data set. This would capture 90% of the data and throw 10% (5% from the top and 5% from the bottom).
Evaluation of a Representative Time Period for Load Calculations	The historical wastewater flow trend varies for each agency, but it is generally in a stable or decreasing pattern after 2006 potentially due to conservation. Decreasing flow and increasing COD and TSS concentration trends are noted for most agencies while no obvious changes have been noted for few of them. The decreasing flow and increasing concentration trends are likely a consequence of water conservation.	It is recommended to use the latest 5-year running average instead of averaging the historical data. Using a 5-year running average will ensure that the data used for billing represents current conditions. The currently practice of quarterly sampling produces 20 data points over a five year period. This is considered adequate. Similar to what is practiced by the City of Los Angeles, the City may consider sampling new dischargers for the first two years and rely on quarterly sampling during subsequent years. Increased sampling frequency could also be temporarily instituted if the wastewater characteristics (flow or strength) have drastically changed at an existing location due to flow diversion or the addition or deletion of a significant tributary discharge.
Review of Practices in Similar Agencies	Billing practices of Orange County Sanitation District and City of Los Angeles, the two agencies of similar size and complexities were reviewed. The objective was to report the billing methods practiced in other, similar agencies. Information gathered could lead to recommending and possibly applying practices that have proven successful at these agencies.	Consider increasing the frequency of sampling to monthly or bi-monthly for the first 1 to 2 years for new dischargers or when existing dischargers make significant operational changes that ultimately impact the quality of their discharge quality. The frequency could be reduced to quarterly sampling during subsequent years. This could also be performed for agencies, such as Padre Dam MWD and Otay MWD, who discharge treatment waste that are much different from the majority of discharges from other Metro System dischargers. Consider a similar increased sampling frequency when the wastewater characteristic at an existing monitoring location is expected to change because of the addition or deletion of a significant tributary discharge or if flow diversion occurs. Consider reducing the averaging times to 3 to 5 years rather than using the entire historical data.

1. Introduction

The City PUD operates the Metro System which serves the City and 15 PAs outside of the City's jurisdiction. As a result of the Federal Clean Water Act of 1970, The City has received significant grant funding for Point Loma Wastewater Treatment Plant projects and other facilities associated with the Metro System. The Clean Water Grant program is administrated by the State Water Resources Control Board. Under the provisions of the grants received, a financial plan and revenue program was required which demonstrates that each user pays their fair share of costs proportional to discharge, considering both quantity of flow and strength of discharge defined in terms of COD and TSS.

The Design/Function methodology was chosen as the best alternative for the Metro System to determine the proportion of the total annual cost consisting of Capital Improvement Projects (CIP), operations and maintenance (O&M), and debt services. The City currently allocates the cost of operating and maintaining Metro System facilities based on this methodology developed in the 1990s. This cost allocation methodology is described on Figure 1-1.

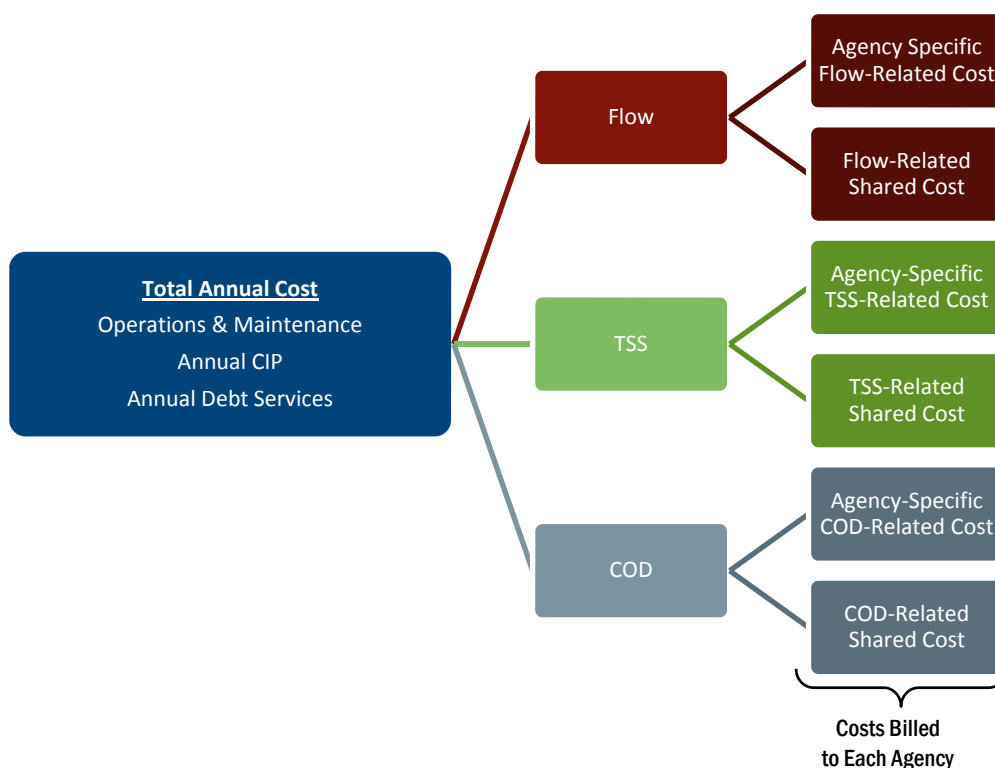


Figure 1-1. Schematic of the Cost Allocation for the Total Annual Cost of Operating and Maintaining the Metro System

Flow governs the annual costs spent on power, chemical and, most often, the size and thereby the cost of new facilities to be constructed. Metro System flow is measured through an extensive system of flow meters located throughout the collection system. The total system flow is determined by adding or removing equivalent dwelling units (EDU) values for unmetered subareas. TSS concentration can affect chemical costs, the volume of sludge produced, and the life of certain equipment. COD is an indirect measure of the

amount of organics in the wastewater and contributes to the cost of secondary treatment. The presence of organics also impacts generation of odors and the consequent corrosion of equipment exposed to the corrosive gases produced. TSS and COD are measured at approximately 30 locations throughout the service area to identify the values contributed by each participating agency. Each site is sampled quarterly for a 24-hour period.

The PUD wishes to evaluate the strength-based billing methodology to ensure that costs are equitably distributed among participating agencies. The PUD's initial concerns about the methodology include:

1. A number of older samples included in the database and used in strength calculations may no longer be valid because of changing conditions; specifically water conservation.
2. Do the sampling locations and application of the resulting data appropriately represent the strength of flow from each agency?
3. There are at least two special conditions in the system where agencies treat wastewater and discharge the residual solids into the Metro System. The PUD wants the effects of these discharges evaluated to ensure the billing is equitable.

1.1 Scope of Work

BC was contracted by the City to evaluate the current strength-based billing methodology and make recommendations to ensure the billing of the participating agencies is equitable in relation to the value received from the Metro System. The scope of work is divided into five tasks:

- **Task 1 – Obtain and Review Historical Wastewater Flow and Strength Data.** The intent of this task was to thoroughly review the existing data to evaluate the impact of water conservation and system changes may have had on the flows and loads of the Metro System. Another objective of this task is to determine the appropriate averaging times for the historical wastewater strength data used for calculating the loading from each agency.
- **Task 2 – Review Practices in Similar Agencies.** The objective of this task is to report the billing methods practiced in similar agencies. The information gathered from this task could provide insight into the practices that have proven successful at other agencies.
- **Task 3 – Examine Each Participating Agency's Flow Measurement and Sampling Locations.** The objective of this task is to closely examine the sampling and metering locations and determine if data collected from these locations is equitable and truly representative of the contribution from each agency.
- **Task 4 – Examine Otay Water District, Padre Dam Municipal Water District and County of San Diego's Flow Measurement and Sampling Locations.** The objective of this task is to specifically focus on the first two agencies that have unique discharges to the Metro System. Review of the County of San Diego system is also performed since the sampling and flow monitoring location used to determine the County's contribution receives significant discharges from other PAs, including Otay WD. Sampling and metering locations are examined and mass balance calculations are reviewed under this task.
- **Task 5 – Prepare TM.** The result of this task is this TM, presenting the findings, conclusions and recommendations of the evaluation.

As part of the project, BC will develop a presentation that summarizes this evaluation. The presentation will be delivered to a group selected by the City after the final TM submittal.

2. Review of Each Agency's Flow Measurement and Sampling Locations

The flow meter and sampling locations for each PA were analyzed to determine if the existing locations are appropriate for recording flows and collecting representative samples for strength analysis. The results of the analysis are summarized in this section.

2.1 Flow Measurement Locations

A list of the flow meters and the respective flow contributions associated with each PA (in order from the highest contribution to the lowest) is presented in Table 2-1. The table also includes information on flow contributions from unmetered house counts. Net agency flows presented in the table are fiscal year (FY) 2011 flows. Flow meter locations shown in red (also marked with *) are the current sampling locations for wastewater characterization. The last column of the table presents the dominant land use type for the flow meter catchment areas. It should be noted that information presented in this column is based on general land use type for each area as reported to BC.

Currently, ADS Services Inc. (ADS) has a contract with the City to continuously record and monitor wastewater flow at the metering locations. Flow data is collected, processed and reported to the City monthly. ADS performs quality checks on the flow data before submitting monthly reports to the City. The City personnel utilize a spreadsheet to compare the current month's flow data with the previous month's data. If the difference exceeds 10 percent, the data is flagged and the City has the option of requesting ADS check the accuracy of the data.

Monthly flow data is used to calculate net flow contributions from each PA for billing. Billing formulas used to calculate the net flows were established by an agreement with the PAs. The formulas are reviewed, modified, signed and approved by the PAs on an as needed basis. PAs with inter-agency flows (i.e., where another PA's flow enters and passes through their system) are responsible for reporting changes to the City. The current billing formulas used to calculate the net agency flows are provided in Appendix A.

In addition to the flow metering data, unmetered flow from house counts are also used for almost every PA. Unmetered flows are calculated based on estimated house counts reported in terms of EDU and the assumed wastewater unit generation rate (UGR) per EDU for the area. The assumed population per EDU is 3.5 people. House counts may change over time; it is the responsibility of the impacted PAs to determine, confirm, modify and come to agreement on house counts with other affected agencies per their agreement with the City.

In earlier years, billing calculations were based on a UGR of 280 gallon per day (gpd) per EDU – a value suggested in the City's Sewer Design Guideline. This value includes a wet weather flow component (about 4.4 percent of the average dry weather flow) consisting of a cumulative infiltration and inflow (I&I) volume representing a two-year frequency rain event distributed evenly over a year. The PAs have suggested that this value should be lowered to reflect the lower flows that were reported in early years of the strength based billing. The City consequently reduced the UGR to 265 gpd/EDU (or 75 gpd per capita) in the late 1990s, which is the current UGR value used for most unmetered flow calculations. By comparison, typical UGR reported in literature¹ is between 70 to 95 gpd per capita for residential areas.

Unmetered flows from PAs discharging into the Spring Valley Trunk Sewer (SVTS) are determined using a lower UGR value. A study conducted by the Otay WD showed that the UGR that should be applied for the sewer basin tributary to the SVTS is 240 gpd/EDU. The City began using this figure on subsequent bills.

¹ www.maderacounty.com/rma/archives/uploads/...gwastewatertreatment.pdf; <http://www.eolss.net/EolssSampleChapters/C06/E6-13-04-05/E6-13-04-05-TXT-05.aspx>

Table 2-1. Billing Flow and Sampling Locations for Participating Agencies and City of San Diego

Participating Agency	Flow Meter Name	Percent PA Flow Contribution ^a and Net Agency Flow	Dominant Land Use Type ^g
Chula Vista	CV2*	29%	90% single family
	CV14	21%	60% recreational, 30% single family
	CV1*	19%	70% single family, 20% industrial
	CV3	12%	60% single family, 20% recreational
	CV7	6%	95% recreational
	CV10	3%	80% recreational, 20% single family
	CV12	3%	Single family
	CV9	2%	Single family
	CV11	2%	Single family
	CV6	0.5%	Single family
	CV8	0.4%	Single family
	CV5	0.4%	Transport
	Unmetered EDUs	2%	Single family
	Net Agency Flow	16.3 mgd	
Coronado	C1M*	61% is Coronado flow ^b	50% recreational, 25% single family, 25% transport
	C2	6% (-) ^b	Recreational
	C3*	33% (-) ^b	Military
	Net Agency Flow	1.6 mgd	
Del Mar	DM1	16%	Transport
	DM2*	85%	40% recreational, 40% single family, 10% transport
	Unmetered EDUs	1% (-)	Single family
	Net Agency Flow	0.6 mgd	
El Cajon	EC1*	96%	70% single family, 25% transport, 5% industrial
	LM4	3%	80% single family, 10% transport, 5% commercial
	Unmetered EDUs	1%	Single family
	Net Agency Flow	7.6 mgd	
East Otay Mesa	OMEC01*	67%	Industrial
	Unmetered EDUs	33%	Single family
	Net Agency Flow	0.03 mgd	
Imperial Beach	IBM3*	53%	Multi family
	IB1*	36%	Single family
	IB2	8%	Single family
	Unmetered EDUs	3%	Single family
	Net Agency Flow	2.2 mgd	
La Mesa	LM3*	56%	80% single family, 10% commercial, 10% industrial
	LM7*	15%	Single family
	LM1A*	7%	Single family
	LM8	1%	Single family, transport
	Unmetered EDUs	21%	Single family
	Net Agency Flow	5.0 mgd	

Table 2-1. Billing Flow and Sampling Locations for Participating Agencies and City of San Diego

Participating Agency	Flow Meter Name	Percent PA Flow Contribution ^a and Net Agency Flow	Dominant Land Use Type ^g
Lemon Grove	LG2	46%	90% single family, 10% transport
	LG1*	9%	60% single family, transport, recreational, commercial
	LG4	19%	--
	LG3	9%	--
	Unmetered EDUs	17%	Single family
	Net Agency Flow	2.2 mgd	
National City	NC3A*	36%	40% single family, 20% multi family, transport, commercial
	NC5*	19%	Transport
	NC3B	16%	Single family, multi family, industrial, services; about 25% each
	NC7M	14%	Single family
	NC2	6%	30% single family, industrial, commercial, recreational
	NC15	4%	Single family
	NC8M	2%	--
	Unmetered EDUs	3%	Single family
	Net Agency Flow	4.4 mgd	
Otay	PA conducts the sampling at treatment plant		
	Net Agency Flow	0.4 mgd	
Padre Dam	PD1B*	81%	40% single family, 30% recreational, industrial, transport
	PD2	14%	Single family
	Unmetered EDUs	5%	Single family
	Net Agency Flow	2.5 mgd	
Poway	P02*	71% is Poway flow ^c	80% single family, 10% industrial, 10% commercial
	P01	10% (-) ^c	40% single family, 40% recreational, 20% services
	P05	5% (-) ^c	Recreational
	P06	4% (-) ^c	Recreational
	P03M	3% (-) ^c	Recreational
	P04	3% (-) ^c	Single family
	Unmetered EDUs	4% (-) ^c	Single family
	Net Agency Flow	3.2 mgd	
Lakeside/ Alpine	LS2*	100 %	90% single family
	Net Agency Flow	3.2 mgd	
Spring Valley	SV8* ^d	52% Spring Valley	80% single family, multi family, recreational, transport
		21% Chula Vista	50% recreational, 45% single family
		14% B01	Single family, multi family
		4% La Mesa	Single family
		3% Lemon Grove	Single family
		3% Otay	--
		2% San Diego Houses	Single family
		1% National City	Single family
	Net Agency Flow	7.4 mgd	

Table 2-1. Billing Flow and Sampling Locations for Participating Agencies and City of San Diego

Participating Agency	Flow Meter Name	Percent PA Flow Contribution ^a and Net Agency Flow	Dominant Land Use Type ^g
Winter Gardens	WG1M*	60%	Single family
	Unmetered EDUs	40%	Single family
	Net Agency Flow	1.0 mgd	
San Diego	SD1B	26%	Single family, transport
	SD9*	19%	Military
	SD19	13%	Recreational, multi family, single family, office, transport
	SD33*	10%	Recreational, hotel
	South Bay Inf.	4%	--
	SD40*	3%	Single family, recreational, office, commercial, transport
	SD2B	3%	Single family, recreational, transport, multi family
	SD7A*	3%	90% transport, multi family, commercial, recreational
	SD6	2%	Single family, transport, industrial, multi family, recreational
	SD5*	2%	Single family, military, recreational
	SD10*	2%	60% industrial, recreational, transport, rural homes
	SD7C	2%	Transport
	SD1E*	2%	Single family, transport
	B01	2%	--
	National City meters ^e	2%	--
	SD2A*	1%	60% recreational, single family, multi family, transport
	SD8*	1%	Transport, single family
	SD9D	1%	70% single family, transport, military
	PC1	1%	--
	SD11*	0.6%	Single family, multi family
	SD20	0.6%	--
	Navy meters ^f	0.4%	Military
	SD7B	0.3%	--
	SD3	0.2%	Transport, commercial, industrial
	SD12*	0.2%	Transport
	SD42	0.1%	--
	Unmetered EDUs	2%	Single family
	Net Agency Flow	110 mgd	

a. Percentages are calculated based on FY 2011 flow data.

b. C1M is a flow meter located furthest downstream; flow measured at C1M includes C2 and C3 flows. The C2 and C3 flows are subtracted from C1M flow to determine the net Coronado flows.

c. PO2 is a flow meter located furthest downstream; flow measured at PO2 includes other Poway flow meter flows. Other Poway flows are subtracted from PO2 to determine net Poway flows.

d. SV8 includes the flows from all the Agencies listed in the next column.

e. Equal to flows at NC10 + NC11 + NC12 + NC6 – Olive Ave. – Racheal Ave. North

f. Equal to flows at USN4 + USN5 + USN8

g. Land use type information is intended to provide a general idea based on visual observation from a GIS map. It is not based on detailed evaluation.

In Del Mar, a UGR of 263 and 280 gpd/EDU are used, depending on the location. A UGR of 280 gpd/EDU is used for two neighborhoods in the Padre Dam Municipal Water District (MWD) service area. The City indicated that future bills sent to the Padre Dam MWD will reflect the lowering of the UGR from 280 to 265 gpd/EDU for the two neighborhoods to be consistent with the UGR applied to other agencies.

2.1.1 Issues with the Net Flow Calculations and Recommended Improvements

This section provides a discussion on certain issues related to the current methodology of calculating flows for billing purposes and presents recommended improvements.

Unmetered Flows. Unmetered flow contribution is significant for some agencies such as La Mesa, Lemon Grove, Winter Garden and Spring Valley. Unmetered flow contribution for La Mesa and Lemon Grove are about 20 percent of the agency's total net flow, whereas it is about 40 percent of Winter Garden's total net flow. In Spring Valley, the unmetered fraction represents about 10 percent of the total net flow. For other agencies, unmetered flows are between 1 to 4 percent of the total net agency flows, which is considered minor.

Some agencies questioned how well the calculated flows represent the wastewater generated in the unmetered housing areas. Metering flows for a predetermined number of house counts was suggested by some PAs. Table 2-2 shows the ten highest unmetered flows calculated in FY 2011. The addition of flow meters to monitor flow generation at these locations should be considered, particularly at the highlighted locations. Metering would provide a more accurate accounting of significant and impactful flow streams where unmetered flow contribution is significant.

Table 2-2. Highest Ten Unmetered Flows Calculated in FY2011

Agency Where Flow is Generated	Agency Initially Receiving Discharged Flow	Housing Area ^a	EDU	Approved Unit Generation Rate (gpd)	Estimated Flow (mgd)
La Mesa	Spring Valley	Combined EDUs to SV	2712	240	0.651
San Diego	San Diego	Barnett Avenue	2552	265	0.612
San Diego	San Diego	N. Harbor Drive	2550	265	0.612
San Diego	San Diego	Beech Street	1944	265	0.467
Lemon Grove	Spring Valley	Combined EDUs to SV	1548	240	0.371
San Diego	San Diego	Commercial Street	1459	265	0.350
San Diego	San Diego	Elm Street	1455	265	0.349
Winter Garden	El Cajon	Combined EDUs to EC	1383	265	0.332
Chula Vista	Spring Valley	Combined EDUs to SV	1040	240	0.250
La Mesa	Lemon Grove	Combined EDUs to LG	921	265	0.221

a. As reported in a City-provided spreadsheet titled "capflw11.xlsx"

As a guideline, the City installs flow meters in sewers where the flow reaches or surpasses 0.2 million gallons per day (mgd). This is about 750 EDU based on a UGR of 265 gpd/EDU. By comparison, the City of Los Angeles (LA) uses 0.5 cubic feet per second (0.32 mgd) or 1,200 EDUs (based on 265 gpd/EDU) as the cut off for flow meter insertion. The City can use the suggested value of 0.2 mgd as the threshold for flow meter insertion. Should the City continue to use the 0.2 mgd (or 750 gpd/EDU) threshold, flow meters should be installed at the locations identified in Table 2-2. The challenge will be finding a good downstream location to capture all the flows contributed from these EDUs. The configuration of the sewer collection system may require multiple flow meters in one house-count community. Each PA should collaborate with the City in determining the appropriate metering location.

UGR Values. The current UGR value of 265 gpd/EDU being applied to unmetered areas stems from the original UGR value of 280 gpd/EDU suggested under the Clean Water Program Design Standards. The 9.5 percent reduction instituted in late 1990s occurred after a review of the flow trends at the Point Loma Wastewater Treatment Plant. UGRs can vary from agency to agency depending on the water conservation and general water use practices followed by the agencies and the tightness of the pipeline to prevent I/I. The UGR should be re-evaluated periodically to determine if it matches the average of the recorded UGRs in the last 5 years, potentially increasing the confidence level in the unmetered flow calculations. PAs could also conduct studies on their own to determine the appropriate UGRs specific to their service areas and seek an agreement with the City to use a different UGR value for unmetered flows in their area.

A recent study conducted by a PA substantiated the use of 265 gpd/EDU. As part of the Wastewater Characterization Study conducted by Padre Dam MWD, a flow meter was inserted in a manhole capturing the wastewater flow generated in the Cowles Mountain housing area. Average wastewater flow was 68,700 gpd based on the continuous flow monitoring performed in the month of June 2010. At this flow rate and the reported house count for Cowles Mountain, the calculated UGR for the area is 258 gpd/EDU. Applying the City's estimating procedure to account for I/I, the dry weather UGR was increased by 4.4 percent to arrive at an estimated yearly average UGR of 269 gpd/EDU. A good match to the current UGR of 265 gpd/EDU considering the precision and accuracy of the monitoring methods applied.

North City and Metropolitan Biosolids Center Discharges at Meter Location SD1B. Flow measured at meter SD1B accounts for approximately 29 mgd, or about 26 percent of the total flow assigned to the City. SD1B includes the centrate flow from Metropolitan Biosolids Center (MBC) (about 2.4 mgd), North City Water Reclamation Plant (WRP) effluent and bypass flows, and other discharges from the City between the North City WRP and SD1B as shown on Figure 2-1.

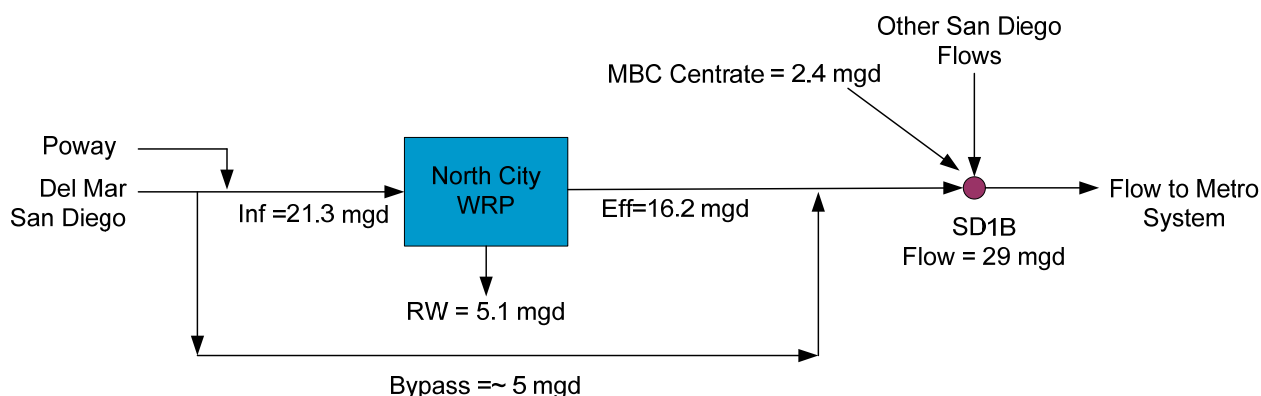


Figure 2-1. Sewer Flow Schematic Relative to SD1B

The MBC centrate flow stream is considered a regional flow and the associated cost for treating and conveying this flow is shared amongst the agencies. Therefore, the MBC centrate flow should be deducted from the flow measured at SD1B. Review of FY 2009 and FY 2010 billing calculations revealed that only Point Loma-related centrate flow (about 1.2 mgd of dewatering centrate) had been deducted from the City flows instead of the entire MBC centrate flow (about 2.6 mgd of thickening and dewatering centrate). This resulted in higher flows assigned to the City. However, in FY 2011, a correction was made that appropriately deducted the entire MBC centrate flow from the flows recorded at SD1B.

Figure 2-1 shows the flow balance around the North City WRP. Reported flow values on Figure 2-1 are based on FY 2011 flow measurements. North City WRP receives all the flows from Poway and a portion of the flows from Del Mar and San Diego. Unless all flow from Pump Station No. 64 is diverted to the North City WRP, the remainder of the flow from Del Mar and San Diego bypasses the plant and is discharged into the Metro System, upstream of SD1B. A majority of the recycled water produced at the North City WRP is considered to leave the system altogether; unused tertiary treated water for recycled water production is discharged in to the Metro System.

The net City flow generated upstream of SD1B is currently calculated based on the following formula:

$$\text{(Equation 1)} \quad \text{Net City Flow at SD1B} = \text{SD1B} - \text{Net Poway} - \text{Net Del Mar}$$

Equation 1 does not consider the recycled water produced at the North City WRP that leaves the system. The equation should be revised to include the recycled water produced and reused to accurately estimate the City of San Diego flows generated in the North City basin. The following equation (Equation 2) should be used to estimate the year end net City flow at SD1B:

$$\begin{aligned} \text{(Equation 2)} \quad \text{Net City Flow at SD1B} &= \text{SD1B} - \text{Net Poway} - \text{Net Del Mar} \\ &\quad - \text{MBC Total Centrate Flow} + \text{Total Recycled Water Used} \end{aligned}$$

2.2 Sampling Locations

As mentioned in Section 2.1, the red text in Table 2-1 represents the flow metering locations where samples are also collected for wastewater characterization. From the table, it is clear that samples are not gathered at every flow metering location, mainly due to the high cost involved in sampling and analysis. Only a few locations are selected to represent the characteristics of wastewater generated within the respective agency. The general tendency is to select the locations where a majority of the agency flows pass through. For example, samples are collected at CV1 and CV2 since flows recorded at these locations represent about 48 percent of the net flow from the City of Chula Vista.

Current sampling locations were examined according to the following two criteria to determine if the assigned sampling locations are equitable and representative:

1. Do the sampling locations represent the majority of the flows from the agency; and
2. Are the sampling locations representative of the agency's main flow characteristics based on land use type?

2.2.1 Issues with the Sampling Locations and Recommended Improvements

As seen in Table 2-1, most of the sampling locations adequately represent a majority of the flow coming from each agency, except for the instances noted below.

Lemon Grove. Due to recent changes in Lemon Grove sewer system, the current sampling location, LG1, represents 9 percent of the total agency flow whereas LG2, which is metered for flow but not sampled, makes up about 46 percent of the agency flow. It would appear that sampling at LG2 instead of LG1 would provide more representative data for Lemon Grove.

San Diego. The City has 12 sampling locations throughout its main service area. As seen in Table 2-1, SD11 and SD12 are among the current sampling locations representing only 0.6 and 0.2 percent of the total City flow, respectively. Comparatively, no wastewater samples are collected from flow metering locations SD19 and SD2B where up to 13 and 3 percent, respectively, of approximately 110 mgd (FY 2011 flow) of the total City flow is passing. Unless there is a specific reason for not sampling at these locations (e.g., access, traffic, etc.), samples should be collected from them instead of SD11 and SD12 to provide a better characterization of City flows.

Wastewater flows reaching sampling location SD11 has steadily been diverted to the Grove Avenue Pump Station to provide flow to the South Bay Water Reclamation Plant since its operation starting 2002. Current flows and loadings at SD11 are about 10 percent of the values reported prior to 2002. The City indicated that two locations, SD11A and SD18 combined capture the flows recorded at SD11 prior to the diversion. In 2010, SD11A and SD18 combined represented about 4 mgd or 3.5 percent of the total net City flow. Alternatively, SD11A and SD18 can be included in the monitoring program.

In summary, the City should consider discontinuing sampling at SD11 and SD12 and start sampling at SD19, SD2B, SD11A, and SD18. This change would increase the total number of City-specific sampling locations to 14, but would provide a better representation of City flows. If the City wishes to stay with 12 sampling locations due to cost issues, then we recommend discontinuing sampling at SD2A or SD8 (both contribute only about 1 percent each of the total net City flow).

Sampling at SD1B could be considered based on its high flow contribution at about 26 percent, but contributions received from North City WRP and MBC at this location makes this flow stream atypical. Therefore, it is acceptable that SD1B is not sampled for wastewater characterization to represent the City discharges.

Sampling location SD40 flow represents about 3 percent of the total City flow. Historical data show that the last sample at SD40 was taken in January 2010. The sampling was ceased due to construction of the trunk sewer and it is planned to be resumed soon.

National City. Based on a limited land use evaluation of the flow meter's catchment areas, the following observations were made:

- Overall, National City has a mixture of mainly single and multiple family houses with a mixture of transportation, industrial, and commercial land uses.
- Sampling location NC5, where wastewater samples collected are used to represent the National City catchment basin, represent approximately 19 percent of the net agency flow. However, the dominant land use type specific to this catchment area is transportation. Sampling at NC3B might represent National City better since flow at NC3B contributes about 16 percent of the agency flow and the land use types within its catchment area better represent the overall National City land uses.
- Sampling at both NC5 and NC3B is recommended to better represent the National City discharges.

3. Review of Padre Dam, Otay, and County's Flow Measurement and Sampling Locations

Padre Dam MWD and Otay WD operate wastewater treatment scalping facilities that treat wastewater for reclamation. Solids from these facilities are discharged back to the Metro System. In addition, flow and load calculations for the Spring Valley Sanitation District (now managed by the County of San Diego) are complicated due to several inter-agency flow discharges, including the solids discharge from Otay WD. The sampling and monitoring requirements are unique to these agencies and warrant additional evaluation of

the monitoring locations and mass balance calculations. This section provides background information on each agency's system and results of the evaluation.

3.1 Padre Dam Municipal Water District

The Padre Dam MWD serves the City of Santee, a portion of the City of El Cajon, and portions of the unincorporated communities of Alpine, Blossom Valley, Crest, Dehesa, El Cajon, Flinn Springs, Harbison Canyon and Lakeside. Wastewater generated within the Lakeside Water District boundaries goes through Padre Dam MWD service area before entering into the Metro System. Currently, an average of 5 mgd of wastewater is generated within the service area. Forty percent of the wastewater (approximately 2 mgd) is conveyed to the Ray Stoyer Water Recycling Facility (WRF); the balance goes to Metro System. Sludge generated at the Ray Stoyer WRF is also discharged to the Metro System. Figure 3-1 shows the Padre Dam MWD sewer collection system flow diagram, including sampling locations LS2, PD1B and PD2 (identified as the purple dots) used to estimate the flow from Padre Dam MWD.

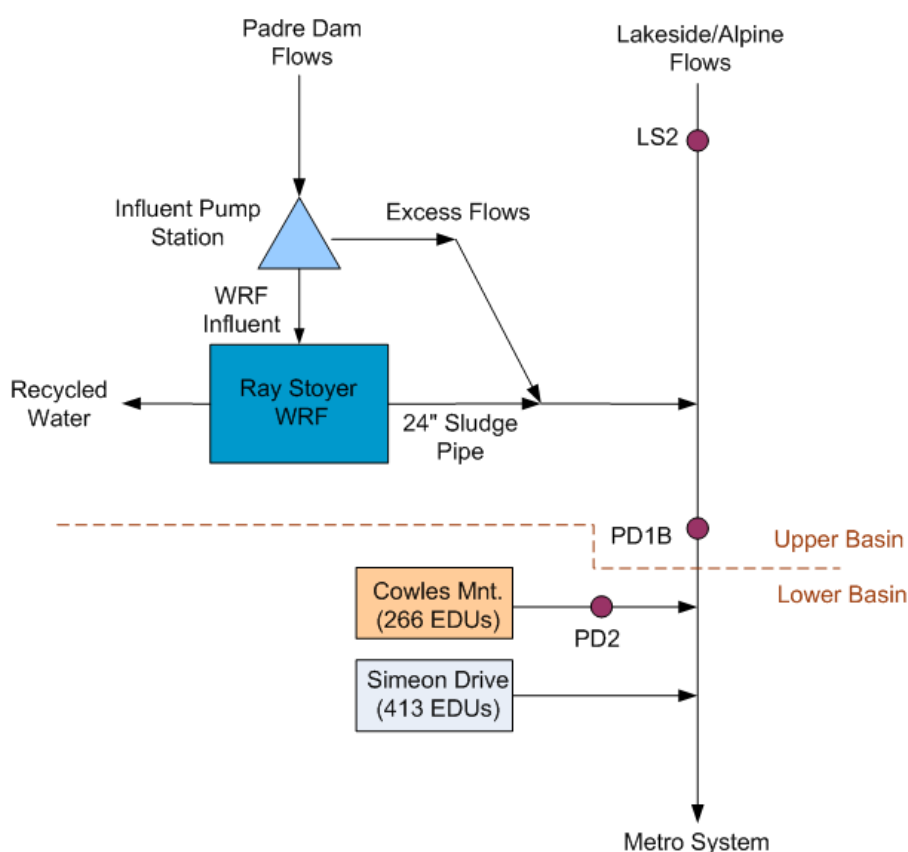


Figure 3-1. Schematic Showing the Padre Dam MWD Sewer Collection System and Flow Metering Locations

The following equation (Equation 3) is used to calculate the wastewater contribution from Padre Dam MWD:

(Equation 3)

$$\text{Net Flow from Padre Dam MWD} = (\text{PD1B} - \text{LS2}) + (\text{PD2} - \text{Cowles Mountain}) + \text{Simeon Dr.}$$

Lakeside/Alpine flows are recorded at sampling location LS2. At PD1B, about 80 percent of the Padre Dam MWD wastewater flows in the Upper Basin pass through this location in addition to flows that go through LS2. Flows at PD2 include flows from the Lower Basin including house counts at Cowles Mountain, a City of

San Diego community, and residential flows from the Padre Dam MWD service area (about 15 percent of the total flow from Padre Dam MWD). The balance of the Padre Dam MWD flows (about 5 percent) comes from houses on Simeon Drive. Cowles Mountain and Simeon Drive flows are not monitored; instead, they are calculated based on house counts and an assumed unit wastewater generation rate of 280 gpd/EDU. The City indicated that future bills will use a lower UGR of 265 gpd/EDU to be consistent with the UGR applied to other agencies.

The City determines the COD and TSS loadings from Padre Dam MWD using a similar equation as Equation 3, except loads are used rather than flow. The City performs quarterly sampling at PD1B and LS2 and determines the wastewater strength based on composite samples. Wastewater COD and TSS loadings at PD1B and LS2 are calculated using the historic average concentrations and the annual average daily flows at these locations. Calculated loads for LS2 are subtracted from calculated loads for PD1B to determine the net loads contributed by Padre Dam MWD in the Upper Basin. Then the corresponding COD and TSS concentrations are back calculated based on the net Padre Dam loads and flows in the Upper Basin as shown in the following equation (Equation 4):

$$\text{(Equation 4)} \quad \text{Representative Concentration in the Upper Basin} = \frac{(\text{PD1B} - \text{LS2}) \text{ Loads}}{(\text{PD1B} - \text{LS2}) \text{ Flows}}$$

These representative COD and TSS concentrations are then used to calculate the COD and TSS loadings from the Lower Basins (at PD2 and from Simeon Drive).

3.1.1 Issues with the Sampling Locations at the Upper Basin and Recommended Improvements

The issue raised by some stakeholders is whether the sampling program implemented at PD1B accurately captures the impact of the sludge discharged by the Ray Stoyer WRF. In theory, the wastewater sample taken at PD1B should include the sludge since the sludge addition occurs upstream of PD1B. However, primary sludge, which contributes the majority of the load, is batch discharged three times per day while waste activated sludge (WAS), screenings, scum and sanitary flows are constantly discharged throughout the day. Flow from an alum application system is also discharged. Primary sludge is typically discharged for 15 minutes at 0600, 1100 and 1430 hours according to Padre Dam MWD. The autosampler at PD1B is currently programmed to take samples every 15 minutes, with 4 aliquots added to one of 24 discrete sampling bottles. Contents of each discrete sample bottle represent an hourly composite; 24 bottles represent one full day. Since the sampling interval is not synchronized with the primary sludge discharge pattern, there is a concern by some stakeholders that samples collected at every 15-minute interval do not contain the sludge.

BC, City and Padre Dam MWD representatives met to review and better understand details of the sludge discharge process. It was described that a pipeline at the Ray Stoyer WRF captures all the plant flows and conveys the mixture to the Metro System by gravity. The pipeline is 24 inches in diameter and approximately 3 miles long. Historically, the discharge flow from the plant averages about 0.22 mgd daily. As a result, the sludge discharge has considerable residence time in the pipeline before reaching the Metro System.

The plant discharge combines with excess sewage flow pumped from the Influent Pump Station (IPS) at a manhole east of the IPS. The combined flow then proceeds by gravity through two, parallel 16-inch-diameter pipelines, towards the upstream end of the two-barrel siphon that crosses beneath the San Diego River. The two-barrel siphon is about 0.4 miles long and consists of one 14-inch and one 16-inch-diameter pipelines. Wastewater from the two-barrels of the siphon then combines and flows by gravity towards a manhole designated by Padre Dam MWD as "MSS." From the MSS manhole, the wastewater flows through a 24-inch-diameter gravity pipeline that connects with the Metro System. At this point of confluence, the Padre Dam MWD flow mixes with other wastewater flowing through the 42-inch-diameter Lakeside Interceptor. Samples collected at PD1B contain a mixture of wastewater from Padre Dam MWD and

Lakeside. A schematic shown on Figure 3-2 illustrates the relationship between the Ray Stoyer WRF, the various pipelines and the sampling locations in the vicinity.

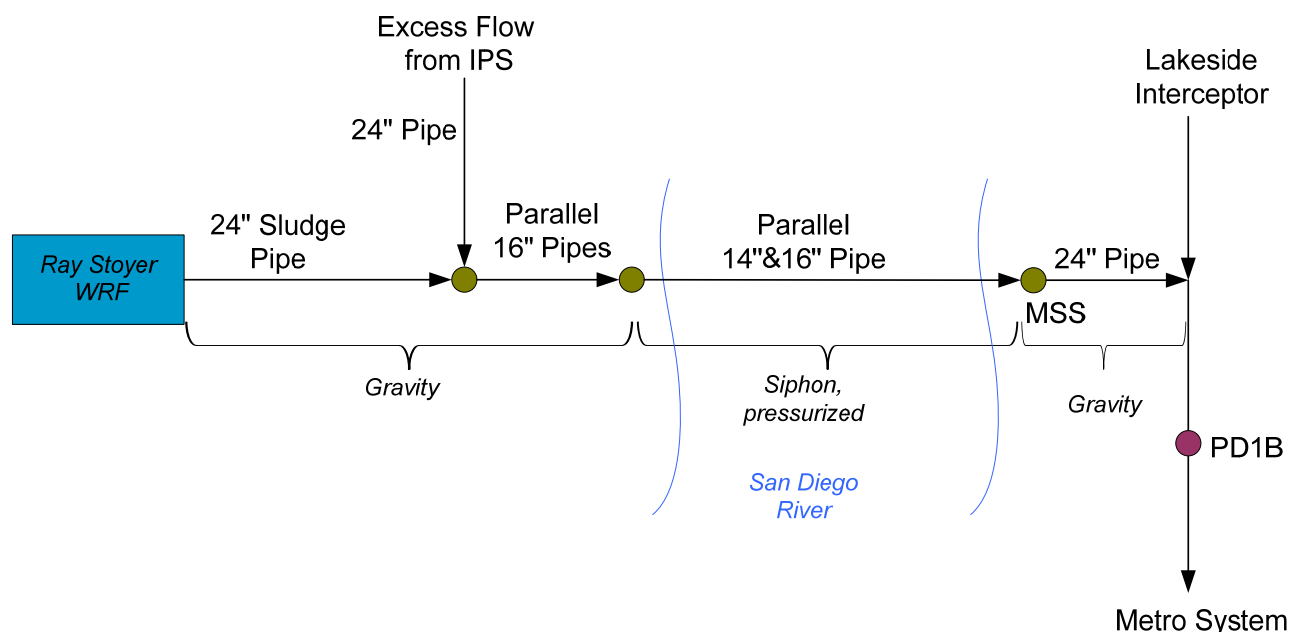


Figure 3-2. Schematic Showing the Padre Dam MWD Sludge Conveyance System

After close examination of the system layout, the project team questioned whether direct measurement at MSS and inclusion of a new sampling and monitoring station immediately located upstream of the point where the Padre Dam MWD flows discharge to the Metro System (identified as S1 in this TM) would yield a more accurate measure of the bypass flows and the discharge from the Ray Stoyer WRF (instead of estimating it using flow and concentration data collected at LS2 and PD1B). If direct flow measurement and sample collection were performed at the MSS, then the net flow and load contribution from Padre Dam MWD could be calculated using the following equation (Equation 5):

(Equation 5)
$$\text{Net Flow (or Load) from Padre Dam MWD} = (S1 - LS2) + MSS + (PD2 - \text{Cowles Mountain}) + \text{Simeon Dr.}$$

From October 10 to 22, 2012, the City concurrently monitored the flow and collected samples at four locations, including LS2, PD1B, MSS and S1. The sampling locations are shown schematically on Figure 3-3. Wastewater flows were recorded continuously during the sampling period. Discrete hourly samples were collected for 5 days and tested for COD and TSS concentrations. Table 3-1 summarizes the average daily flow and concentration data collected during the sampling period.

Hourly COD and TSS loadings at each sampling location were calculated based on average hourly flows and concentrations. Average daily values were then determined for mass balance calculations.

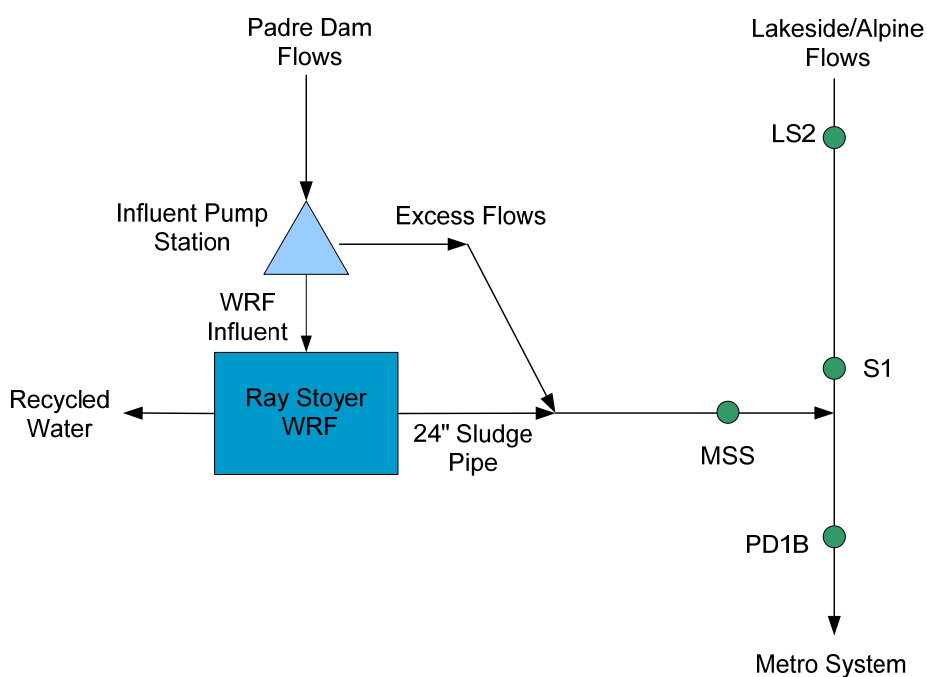


Figure 3-3. Four Sampling Locations for the Short Period Flow Monitoring and Wastewater Characterization Sampling

Table 3-1. Summary of the Average Daily Flow, COD and TSS Concentrations Recorded at the Sampling Locations						
Sampling Location	Day 1 10/10/2012	Day 2 10/11/2012	Day 3 10/15/2012	Day 4 10/16/2012	Day 5 10/22/2012	Overall Average
LS2						
Flow (mgd)	3.04	3.02	3.03	3.08	3.03	3.04
COD (mg/L)	620	646	682	699	754	680
TSS (mg/L)	264	273	271	273	320	280
PD1B						
Flow (mgd)	4.95	4.83	4.75	4.59	4.79	4.78
COD (mg/L)	823	794	923	914	992	889
TSS (mg/L)	430	411	410	446	471	433
MSS						
Flow (mgd)	0.66	0.65	0.74	0.68	0.72	0.69
COD (mg/L)	1836	1856	2352	1887	1557	1898
TSS (mg/L)	1251	1378	1273	1492	1017	1282
S1						
Flow (mgd)	4.15	4.09	3.93	3.87	4.01	4.01
COD (mg/L)	578	648	717	764	743	690
TSS (mg/L)	238	291	299	354	325	301

Note: Reported flows are the daily average of the 15 minute interval flow data. Reported concentrations are flow weighted and calculated based on the following formula: Average Daily Concentration = Total Daily Load / Total Daily Flow*8.34

Ideally, the net flow and load contributions calculated based on Equations 3 and 5 should be equal. Data obtained from this sampling event were used to see if this was indeed the case. In other words, it was checked if net flows and loads for (PD1B-LS2) equals (S1-LS2) + MSS after eliminating the terms common to Equations 3 and 5. Figure 3-4 shows the comparison of the net flow, COD and TSS loadings calculated based on these two equations. As it can be seen from the figures, the values calculated based on the two equations are about ± 10 percent of each other. This is considered as in good agreement when accounting for the possible errors associated with sampling and sample analysis.

The results show that the bypass flows and the discharge from the Ray Stoyer WRF are adequately captured at PD1B. The current protocol of using LS2 and PD1B could continue without the need to monitor at MSS or to install a new monitoring location, S1. Concurrent sampling and monitoring at PD1B and LS2 is strongly recommended to maintain direct correlation between data used for estimating Padre Dam MWD's contributions.

It was noted that average COD and TSS concentrations (889 and 433 mg/L, respectively) measured at PD1B during this sampling event were much higher than the historical average COD and TSS concentrations (590 and 236 mg/L, respectively) the City has been using for the billing purposes. The difference is considered significant.

The best approach to capture the PD1B loads accurately would be to disregard the historical COD and TSS measurements at PD1B and start fresh. In order to form a baseline quickly, a more frequent sampling period can be considered at the initial 2 years, such as monthly or bi-monthly sampling. LS2 has to be sampled concurrently during this period. After collecting about 24 data points, quarterly sampling can be reinstated to reduce cost. A similar approach is practiced at other agencies when a new significant discharger begins to using the sewer system or when an existing significant discharger institute changes to its process such that the quality of its discharge changes considerably.

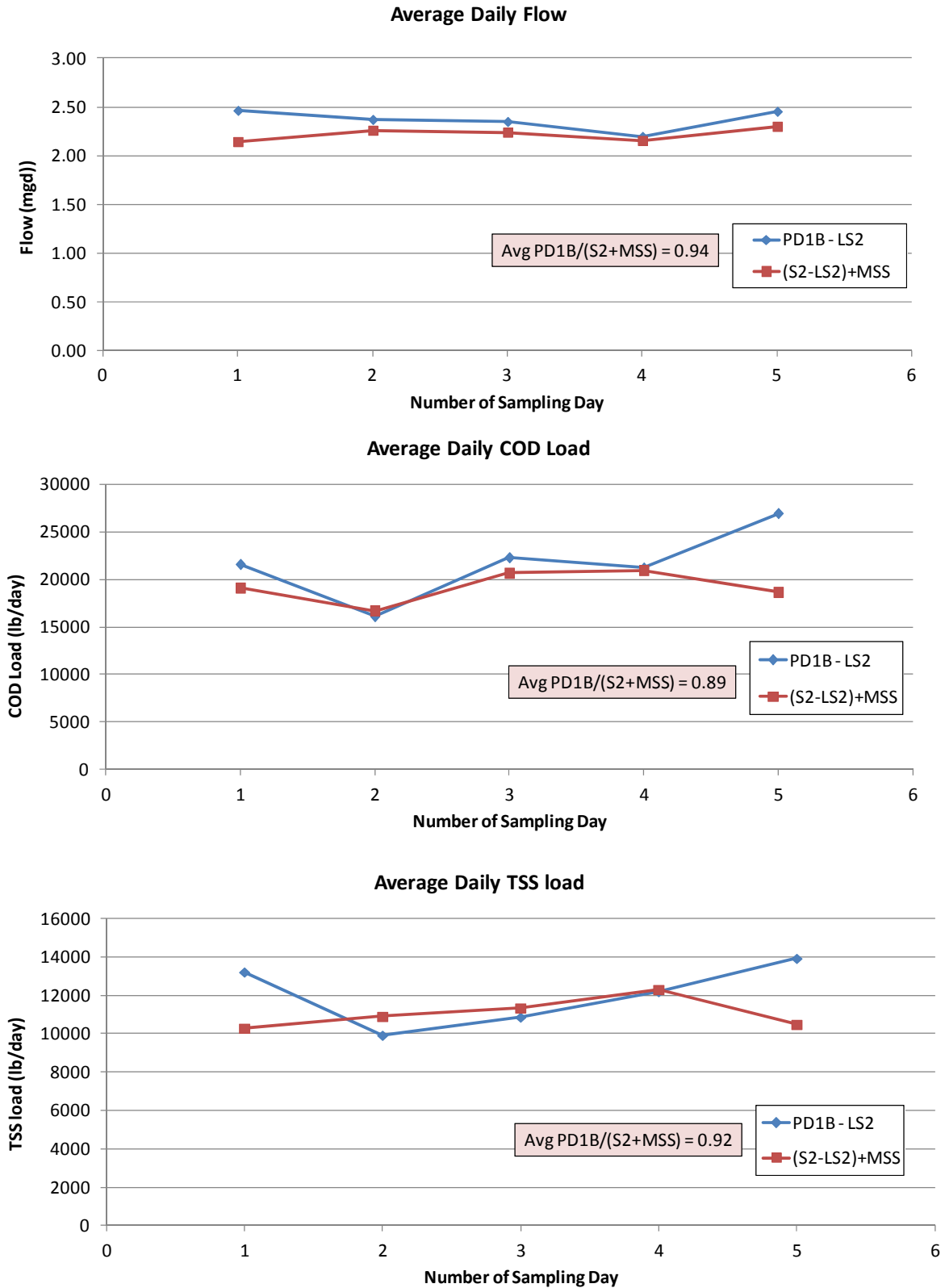


Figure 3-4. Comparison of Net Average Daily Flow, COD, and TSS Loadings (from top to bottom) from Padre Dam MWD Based on Two Mass Balance Equations

3.1.2 Issues with the Load Calculations at the Lower Basin and Recommended Improvements

The COD and TSS concentrations used to characterize Padre Dam WMD wastewater are 697 and 294 milligrams per liter (mg/L), respectively (based on the data set for FY 2011 provided to BC with the LS2 flows subtracted). As described earlier, these COD and TSS concentrations are multiplied by the net Padre Dam MWD flow to determine the total loads. The concern is that these concentrations include discharges from the WRF and reflect wastewater characteristics stronger than typical domestic wastewater. Wastewater received at PD2 and from Simeon Drive is generated mainly by residential communities and, therefore, is expected to have typical domestic wastewater strength.

Wastewater strength was determined at PD2 and at a manhole receiving discharges from Simeon Drive as part of the 2010 Wastewater Characterization Study conducted by Padre Dam MWD. Average COD and TSS concentrations measured at PD2 were 555 and 200 mg/L, respectively, based on 24-hour, flow-proportioned composite sampling for 30 consecutive days. Similarly, the average COD and TSS concentrations measured at the manhole receiving discharges from Simeon Drive were 556 and 156 mg/L, respectively. These values are about 20 and 30 percent lower than the COD and TSS concentrations used to represent Padre Dam MWD wastewater strength in FY 2011, respectively. Applying the calculated representative TSS and COD values for wastewater generated downstream of PD1B will result in over estimating loads from these areas. It is recommended to collect samples at PD2 for wastewater characterization in addition to flow measurement. Limited number of sampling (e.g., 5 to 7 days) would be sufficient to characterize the wastewater since it is mainly from residential community. The concentrations found there could represent Cowles Mountain and the Padre Dam residential flows that go to PD2. This would eliminate the potential overestimation of the load from these locations by the current application of concentration found at PD1B.

3.2 Otay Water District

Otay WD owns and operates Ralph W. Chapman Water Recycling Facility (RWCWRF), treating up to 1.3 mgd of wastewater to full Title 22 recycled water standards. The RWCWRF treats wastewater received from Steel Bridge Pump Station (PS), 67 percent of which comes from the Otay WD customers and 33 percent from the County of San Diego residents (based on the EDU split). The amount of wastewater directed to the RWCWRF is limited to the amount needed by recycled water customers. Excess wastewater is conveyed to Rancho San Diego PS via gravity as shown on Figure 3-5.

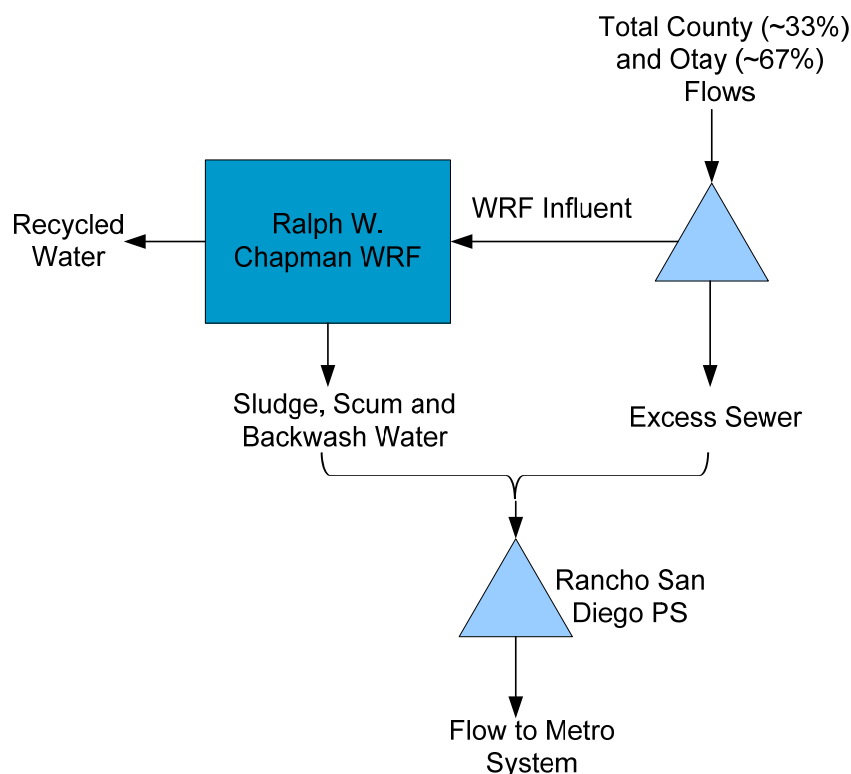


Figure 3-5. Schematic Showing the Relationship between the Ralph W Chapman WRF, Relevant Pump Stations, and Wastewater and Plant Waste Discharges to the Metro System

Solids produced at the RWCWRF, including WAS, scum and screenings, are also directed to the Rancho San Diego PS, where the combined flow is subsequently pumped to the Metro System. In a recent visit, BC was informed that the WAS discharge occurs once a week, 7 hours per event, from morning to about 14:00. Scum discharges intermittently and the screenings discharge continuously. Figure 3-5 shows a schematic of the Otay WD sewer collection system.

The Otay WD meters recycled water production rate and solids flow (including WAS, scum and screenings). County of San Diego meters Rancho San Diego PS discharge flow. The Otay WD calculates the total flow discharged into the Metro System based on these metered flows.

The Otay WD's contribution to the total flow discharge into the Metro System is then calculated based on the EDU split between Otay WD and the County (approximately 67 percent of the EDUs is within the catchment area of the Otay WD). The Otay WD reports their flow discharges to the City on a monthly basis.

Otay WD also prepares a mass balance table for the RWCWRF and sends it to the City at the end of each fiscal year. The table includes annual average daily plant influent flow, recycled water flow, solids (both WAS and screenings) flow, and the corresponding TSS and biochemical oxygen demand (BOD) loads and concentrations.

The City calculates the TSS and BOD loads in Otay WD's untreated wastewater not sent to RWCWRF based on the above information provided by Otay WD and the following equations:

(Equation 6) $\text{Bypass flow} = \text{Rancho San Diego PS Flow} - \text{RWCWRF Solids Discharge Flow}$

(Equation 7) $\text{Bypass TSS Load} = \text{Bypass flow} * \text{RWCWRF Influent TSS Conc.}$

(Equation 8)
$$\text{Bypass BOD Load} = \text{Bypass flow} * \text{RWCWRF Influent BOD Conc.}$$

TSS and BOD concentrations in the above equations are obtained from the City's "Metro Mass Balance" spreadsheet which pulls the data from the RWCWRF mass balance table submitted by the Otay WD.

Overall TSS and BOD load contribution from Otay WD is the summation of the loads from the RWCWRF solids discharge and from the bypass flow. The City converts BOD to COD in the Metro Mass Balance spreadsheet by using a conversion factor of 2.1.

3.2.1 Issues with the Load Calculations and Recommended Improvements

The RWCWRF mass balance tables and calculation spreadsheets used to create the mass balance tables were obtained from the City for review for FYs 2003 and 2007 to 2010. The calculation spreadsheet is known to Otay and San Diego as the "OWD Daily Numbers" spreadsheet. The Study team noted the following issues with the calculations.

Estimating Solids TSS Load. Solids load from the RWCWRF includes TSS loads from WAS and screenings and the following equations (Equations 9 and 10) are used in the *OWD Daily Numbers* spreadsheet:

(Equation 9)
$$\text{WAS TSS Load (lb/day)} = \text{WRF Influent Flow (mgd)} * 2,250$$

(Equation 10)
$$\text{Screening TSS Load (lb/day)} = \text{Estimated screening weight based on measured daily volume}$$

It is not common to estimate the WAS TSS load based on plant influent flow. Otay WD was contacted to understand the basis of the assumptions in WAS TSS load calculations. Otay WD forwarded a memorandum sent to the City, dated October 1993, explaining the methodology of estimating the WAS TSS load. In that memorandum, Otay WD proposed to use a table in a textbook (Wastewater Engineering, Metcalf and Eddy, Inc, 1972) listing typical quantities of sludge produced by different treatment processes. [Note that the same table was also referenced in *Manual of Practice (MOP) 8- Wastewater Treatment Plant Design* dated 1977.] According to the table, dry solids in activated sludge process is estimated to be 2,250 lb per million gallons (MG) of sewage based on a sewage flow of 100 gallons/day/capita and 300 mg/L of TSS in sewage. It appears that Otay WD has been using this estimation methodology since then.

The reason Otay WD preferred following this methodology was stated in the memorandum as not having to measure the volume of WAS and not having to run extra tests to determine the sludge's percent solids concentration. However, Otay WD indicated that WAS solids concentration is now being sampled daily (as a grab) for process control and the impression was that this data has been used to calculate the WAS solids loads. However, no data has been received from Otay WD showing that the measured TSS concentration is used for WAS TSS load estimation.

Otay WD stated that *OWD Daily Numbers* spreadsheet would be modified in FY 2011 to incorporate the measured WAS solids concentration in estimating the WAS solids load. BC supports this revision to better estimate the loads from the Otay WD. The Otay WD already measures the WAS solids content daily and this data should be used to estimate the solids loads. The current methodology of using 2,250 lb per MG of wastewater probably provides and overestimation of WAS solids load since it is based on 300 mg/L of solids concentration in the sewage whereas the average RWCWRF influent solids concentration is around 200 mg/L.

Estimating Solids BOD Load. BOD load from the RWCWRF includes BOD loads from WAS and screening discharges. The following equations (Equations 11 and 12) are currently used in the *OWD Daily Numbers* spreadsheet for estimation:

(Equation 11)
$$\text{WAS BOD Load (lb/day)} = \text{Sludge TSS load (lb/day)} / 2$$

(Equation 12)
$$\text{Screenings BOD Load (lb/day)} = \text{Screenings TSS Load}$$

The October 1993 memorandum, previously mentioned, did not contain information on how the WAS BOD load was estimated. However, based on the spreadsheet, BOD load in WAS is assumed to be half of the TSS load. Based on previous BioWin² model runs for various secondary treatment processes, a TSS to BOD load ratio of 2 is low; higher ratios are more common. This means that the actual BOD load may be less than what is currently being calculated. In addition, BOD content of the screenings is currently assumed to be equal to its TSS content, which is probably an over estimation as well.

Otay WD reported that the following equations (Equations 13 and 14) have been used for mass balance calculations at RWCWRF. However, the data set provided to BC does not show that these equations have been used and no additional data have been received indicating otherwise. Otay WD indicated that the BOD load in WAS discharge will be calculated based on these equations in FY 2011 spreadsheet.

(Equation 13)
$$\text{Sludge BOD Conc.} = [\text{Influent BOD Conc.} - \text{Effluent BOD Conc.}] * [\text{Influent Flow/Solids Flow}]$$

(Equation 14)
$$\text{Sludge BOD Load} = \text{Sludge Flow} * \text{Sludge BOD Conc.} * 8.34$$

The equations above assume that BOD is conserved; i.e., all BOD either leaves the treatment plant as sludge or in the effluent. In reality, some BOD is incorporated into biomass that leaves the plant as TSS, but much is consumed by bacteria and converted to carbon dioxide. Typically, 50 to 80 percent of the BOD that enters the secondary process is converted to carbon dioxide. Therefore, the above calculation will overestimate the amount of BOD in the WAS. BC recommends Equations 11 and 12 be revised to better estimate the BOD load in the WAS. Otay WD could either continuously take samples of the sludge or perform a short-term sampling program (5 to 10 samples) and analyze it for BOD and TSS to arrive at a TSS to BOD ratio that can be confidently applied to Equation 10.

Otay WD Data in Metro Mass Balance Spreadsheet. As described above, the City's *Metro Mass Balance* spreadsheet extracts the data from the RWCWRF mass balance table submitted by the Otay WD. FY 2008 to 2010 calculations have been reviewed. A few errors were discovered in FYs 2009 and 2010 calculations, as noted below.

- The RWCWRF influent TSS and BOD concentrations shown in the *Metro Mass Balance* spreadsheet were lower than the numbers reported by Otay WD in FY 2009 (TSS of 206 mg/L versus 216 mg/L and BOD of 169 mg/L versus 189 mg/L). The reason for the discrepancy is explained as follows: In FY 2009, the RWCWRF was off-line for about three months due to new construction activities. The City calculated yearly average influent and solids flows and loads based on the *OWD Daily Numbers* spreadsheet which included "zero" for flows and loads for the days the plant was off-line. These "zero" values were not eliminated from the spreadsheet before doing the calculations and therefore including them in the calculation lowered the average values. These calculated average flows and loads were then used in the *Metro Mass Balance* spreadsheet to calculate the average RWCWRF influent TSS and BOD concentrations. As a result, the calculation provided lower TSS and BOD concentrations which were then used to estimate the TSS and BOD loads in the bypass flow.
- The FY 2009 Metro Mass Balance spreadsheet had the WAS sludge flow and loads from RWCWRF instead of the WAS and screenings flow and loads. It appears that this was corrected in FY 2010.

BC recommends the City use the average RWCWRF influent concentrations for the days the plant is on-line as reported by the Otay WD, or revise the mass balance calculations to be based on yearly total flows and loads instead of yearly average values. This will eliminate any calculation errors due to plant off-line periods.

² BioWin is a dynamic wastewater treatment process modeling simulation and optimization software used for design and analysis of systems.

3.3 County of San Diego

The County of San Diego Sanitation District is comprised of five county sanitation districts and four sewer maintenance districts that provide sanitation services. The five sanitation districts include Alpine, Julian, Lakeside, Pine Valley and Spring Valley. Sewer maintenance districts cover East Otay Mesa, Campo, Harmony Grove and Winter Gardens. The County Department of Public Works administers, operates and maintains sewerage facilities for all nine sanitation and maintenance districts. Wastewater is discharged into the City's Metro System from Lakeside, Alpine, Spring Valley, East Otay Mesa, and Winter Gardens districts. Below is a summary of the flow and load calculations review for these districts.

East Otay Mesa. Wastewater contribution from East Otay Mesa to the Metro System was minimal and had not been monitored until 2009. Average flow discharge from East Otay Mesa was about 0.03 mgd in FY 2011. Wastewater TSS and COD concentrations are monitored at a sampling and metering location at the Otay Mesa Energy Center. Average COD and TSS concentrations reported there were 103 and 7 mg/L, respectively. These concentrations were used to represent the residential wastewater discharges from 32.2 EDUs at East Otay Mesa. The concentrations are significantly lower than the typical concentrations observed at other residential locations in the County. The plan is to re-initiate the sampling program at a more representative sampling location when the flows increase from East Otay Mesa. Until this is done, applying more representative COD and TSS concentrations to residential discharges is suggested. Average concentrations reported for Winter Gardens or Lakeside/Alpine can be used to represent typical residential discharges.

Winter Gardens. Both wastewater flow and characteristics have been monitored at sampling location WG1M since 1995. Average flow discharge from Winter Gardens area is about 1 mgd in FY 2011. Historical average COD and TSS concentrations are 405 mg/L and 150 mg/L, respectively. No issues have been noticed with these concentrations.

Lakeside/Alpine. Wastewater flow contribution from Lakeside/Alpine communities is monitored at Sampling Location LS2, where wastewater characterization samples have also been taken since 1995. Average flow discharge from Lakeside/Alpine area is about 3.2 mgd in FY 2011. Historical average COD and TSS concentrations are 468 mg/L and 170 mg/L, respectively. No issues have been noticed with these concentrations.

Spring Valley. Spring Valley Sanitation District (SD) is neighbored by several agencies, including the cities of El Cajon, La Mesa, Lemon Grove, National City, Chula Vista and San Diego, and the Otay WD. All the neighboring agencies, except the City of El Cajon, discharge wastewater within the district boundaries which is eventually conveyed to the Metro System.

Sampling Location SV8M, located just before the Metro System connection, has been monitored both for wastewater flow and characteristics since 1995 to determine the flow and load contributions from the Spring Valley SD service area. The City uses the following equation (Equation 15) to calculate the net flow from the Spring Valley SD:

$$\begin{aligned} \text{(Equation 15)} \quad \text{Net Spring Valley SD Flow} = & \text{SV8M} + \text{Spring Valley SD to National City} - \\ & \text{Chula Vista} - \text{National City} - \text{BO1} + \text{Alta Drive} - \text{Otay WD} - \\ & \text{San Diego} - \text{La Mesa} - \text{Lemon Grove} \end{aligned}$$

Figures 3-6 and 3-7 illustrate the flow contribution at SV8M from each agency. Average SV8M flow recorded in FY 2011 was 13.95 mgd. Spring Valley SD flow made up 52 percent of it while the balance came from other agencies shown on Figure 3-7. Significant inter-agency flow contributors include the cities of Chula Vista and San Diego, each providing about 21 and 16 percent, respectively, of the total SV8M flow. The majority of the flows from Chula Vista and San Diego are monitored. Flow additions from La Mesa and Lemon Grove, however, are calculated based on house counts and a unit wastewater generation rate of 240 gpd/EDU.

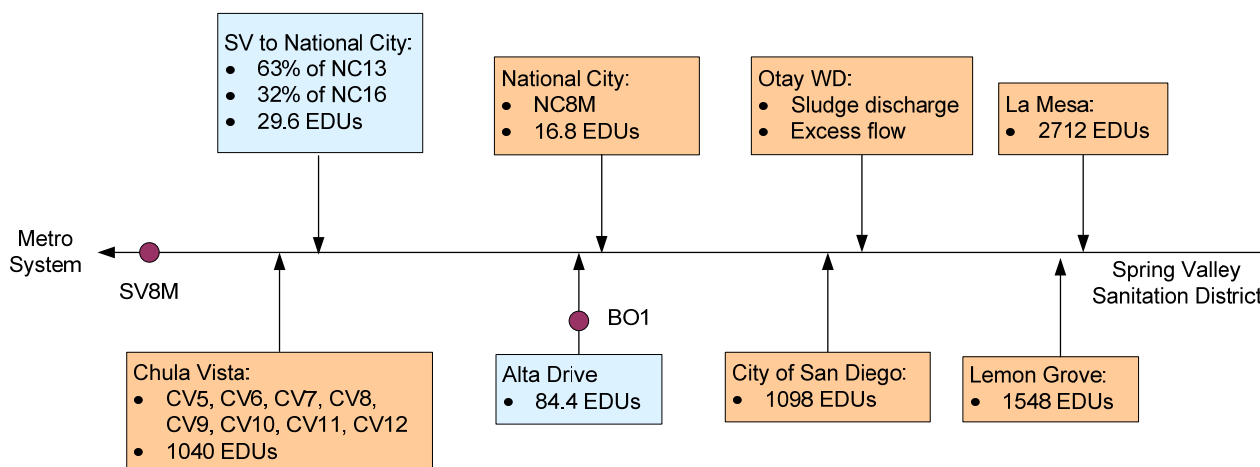


Figure 3-6. Schematic Showing the Discharges Upstream of Sampling Location SV8M

Notes: Orange boxes represent inter-agency flow contributions; light blue boxes represent County flow contributions. By agreement between the County and National City, 63 and 32 percent of NC13 and NC16 flows are contributed by the County, respectively. SV = Spring Valley Sanitation District

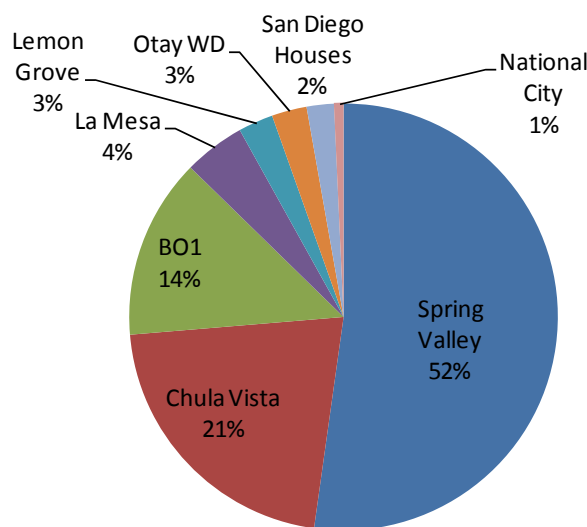


Figure 3-7. Schematic Showing Flow Contributions at Sampling Location SV8M

Notes: Reported percentages are based on FY 2011 data and average SV8M flow of 13.95 mgd.

As described earlier in Section 3.2, Otay WD discharges screenings, sludge, scum and wastewater bypassed at the RWCWRF. Otay WD discharges are considerably different than typical domestic wastewater since it contains screenings, sludge and scum from the treatment plant. COD and TSS loads contributed by the Otay WD are subtracted from the loads calculated at the sampling location SV8M to determine the representative COD and TSS concentrations for the wastewater discharged by the other agencies upstream of SV8M. The underlying assumption with this approach is that all the agencies, except Otay WD, have similar wastewater characteristics. Calculated representative COD and TSS concentrations for the Spring Valley SD are 516 and 191 mg/L, respectively.

As shown on Table 2-1, the dominant land uses within Spring Valley SD area are single family, multi family and recreational. Contributing areas from San Diego are residential communities with single and multi family houses, and a mixture of recreational and single family housing are reported for the tributary areas in Chula Vista. Land use types among Spring Valley, Chula Vista and San Diego communities are not considered significantly different to require additional sampling locations; however, load calculations for Spring Valley SD could be refined with additional sampling. BO1 could be sampled for COD and TSS measurements to better define the characteristics of wastewater from San Diego.

Chula Vista presents a challenge, however, because of the multiple discharge locations. The CV7 location represents the highest Chula Vista flow contribution at about 40 percent of the total flow from this agency. This is followed by locations CV10, CV12 and CV 9 at 18, 15 and 13 percent flow contributions, respectively. CV7 and any one of these locations can be selected for wastewater characterization. In fact, Chula Vista recently requested the City consider sampling at CV7 and CV6 for characterization of their flow discharged into the Spring Valley Trunk Sewer. It is not recommended that sampling at CV6 be performed since the flow passing through this location to the Spring Valley Trunk Sewer is only 3 percent of the total Chula Vista discharge.

4. Review of Wastewater Flow and Strength Monitoring Data

This section describes the current sampling and COD and TSS analytical procedures, presents a review of the current statistical data evaluation method used to estimate the pollutant loadings from PAs, and describes how the agency representative wastewater strength data is estimated. The issues noted with the current methods are identified and suggested improvements are presented.

4.1 Sampling and Analysis Procedures

4.1.1 Existing Procedures

The City's Industrial Waste Laboratory (IWL) schedules and performs the wastewater characterization sampling and TSS and COD analysis at the 33 billing meter locations. Automated portable samplers with 24 discreet bottles are used for sampling. Stainless steel screens are used on the end of the suction tubing to prevent collection of rags and debris. Autosamplers are programmed to collect a 200 milliliter sample every 15 minutes. Autosamplers are not refrigerated and no ice is placed in them during sampling events. However, the sample bottles are placed in ice upon collection and kept in ice during transportation to the laboratory. Upon arrival at the laboratory, the samples are placed in a refrigerator.

As described in Section 2.1, ADS continuously monitors the wastewater flow at all the billing meter locations. After the sampling is completed, the IWL obtains wastewater flow data during the sampling period and manually composites the hourly sample bottle contents into a bigger composite sample bottle based on flow ratio. The TSS and COD analysis are performed on the flow-based composited sample. There are three stages where the samples are well mixed:

1. Prior to dispensing from the 24 discreet bottles into a volumetric cylinder and then into a composite bottle.
2. Prior to dispensing aliquots of the composite sample into the various specific-analyte sample bottles.
3. Prior to being dispensed into a volumetric measurement tool in preparation for TSS and COD analysis.

Standard Methods (SM) 2540.D and 5220.D are followed for measuring TSS and COD, respectively, as described in *Standard Methods for Analysis of Wastewater and Waste* (APHA 2005). Only about 10 percent of the samples received by the laboratory are analyzed in duplicate.

Each billing location is sampled four times a year according to the Metro billing agreement with the PAs.

4.1.2 Recommended Improvements

The following improvements are recommended to the existing sampling and analysis procedures being followed.

Sample Homogenization. SM 5220 for COD analysis states that blending (homogenization) is needed for samples containing suspended solids prior to conducting the test. Blending of the samples can be achieved by homogenizing the samples in a blender for about 30 seconds. Homogenization is an important sample preparation step to reduce variability in the analysis results. Currently, the IWL does not follow the homogenization procedure, which might be contributing to the variability in the results.

Sample Temperature Control. It is ideal to use an autosampler with refrigerator for wastewater collection for TSS and COD analysis. However, it is not usually possible to use refrigerated samplers since the sampling locations are usually sewer manholes and no above ground space is available close to the manholes for placing the refrigerated samplers. In addition, using a refrigerated sampler requires electricity, which is usually not available in the vicinity of sewer manholes. As a result, use of non-refrigerated portable samplers is common in wastewater sampling in the collection system.

It has been always a challenge to keep samples cool at 4 °C during a 24-hour period when non-refrigerated portable samplers are used. These samplers are suspended in a manhole using hangers providing a secure latching on the manhole rim. Only a small amount of ice can be placed in the samplers due to the limited space in the samplers, which is not very effective in keeping the composite sample temperature low. In addition, the added weight from the ice can add more pressure on the sampler hangers, increasing the chance for the sampler to be dislodged from the manhole rim. As a result, it is not common to place ice in the portable samplers during sampling. However, the wastewater samples are usually placed in ice immediately after being collected.

There is a concern that the TSS and biodegradable materials that make up part of the measured COD would degrade if the temperature of the composite sample exceeds 4 °C during a 24-hour period. The measured TSS and COD concentrations would then be lower than the actual values. The degree of degradation is affected by constituents in the wastewater and the type and quantity of microorganisms present. As part of a study BC conducted previously, an experiment was performed on raw sewage. The experiment compared the initial and final TSS and COD concentrations of two identical wastewater samples exposed to two different ambient temperatures: at 4 and 24 °C during a 24-hour period. Based on the analysis results TSS reduction was consistently around 1.4 percent, which was considered within the analysis error margin. However, average COD degradation rate was 9 percent, which was considered higher than the analytical error margin.

This test indicated that some degradation is expected to occur without temperature control depending on the wastewater characteristics, but it was deemed acceptable, due to the difficulties of using ice and the consistent treatment of all entities. Therefore, no additional improvements are suggested to provide temperature control on the collected wastewater samples.

4.2 Statistical Data Evaluation

The City uses the average of historical COD and TSS concentrations collected since late 1990s for billing calculations. However, due to high variability in the analytical results, a statistical evaluation is conducted first to eliminate the outlier data points. The current statistical data evaluation method, with noted issues and recommended changes, are described below.

4.2.1 Current Statistical Data Evaluation Method

Quarterly measured COD and TSS concentrations and daily average flows at the sampling locations are recorded in the database. The collected data is then statistically analyzed as described below assuming that the concentration data follows a normal distribution pattern.

Figure 4-1 shows a typical normal distribution curve. The normal distribution is a pattern for a set of data which follows a bell-shaped curve. The symbol μ represents the mean (average), while σ is the standard deviation of the data set considered. One standard deviation away from the mean includes about 68 percent of the data. Two standard deviations away from the mean include about 95 percent of the data.

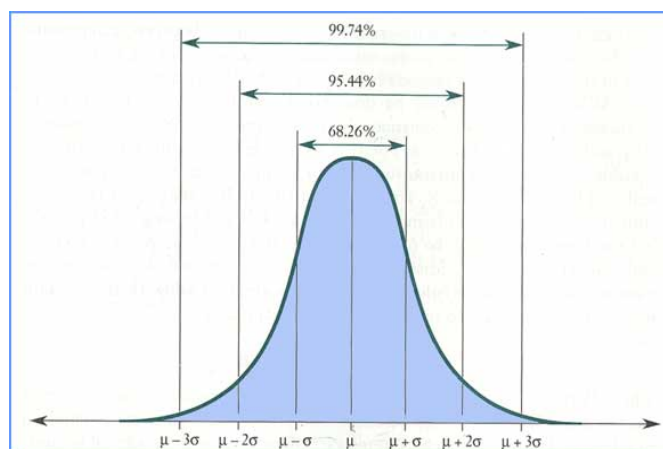


Figure 4-1. A Typical Normal Distribution Curve

The City considers the data within 95 percentile distribution as valid and rejects data outside of these boundaries. Data points lower or higher than the lower and upper boundaries are rejected. Finally, flow-weighted average of the remaining data is determined. The following step-wise process describes the current statistical evaluation performed by the City:

- Step 1.** Calculate the mean and standard deviation of the concentration data.
- Step 2.** Calculate a lower and upper bound assuming a normal distribution using the NORMINV function in Excel (This function returns the inverse of the normal cumulative distribution for the specified mean and standard deviation.) The probability used in the function is 2.5 percent for lower bound and 97.5 percent for upper bound (accepting 95 percent of the data).
- Step 3.** Reject any concentrations outside of the lower and upper bound.
- Step 4.** Recalculate mean and standard deviation without the rejected values.
- Step 5.** Recalculate the lower and upper bound without the rejected values.
- Step 6.** Reject any concentrations outside of the recalculated lower and upper bound.
- Step 7.** Repeat Steps 5 to 7 until the mean does not change and there are no additional outliers.
- Step 8.** Calculate a flow-weighted average on the accepted data points only. This is the concentration used for the site.

4.2.2 Issues with the Current Statistical Data Evaluation Method

The following issues are noted with the current statistical data evaluation method:

Assumption of Normal Distribution. Data sets all have some high points that don't fit the normal distribution. Lognormal distribution appears to fit better for some data sets instead of the normal distribution. The current calculation method appears to reject data until a normal distribution is achieved which results in rejecting a large number of data.

Data Acceptance Criterion. Although the criterion for acceptance is defined as 95 percent of the data, less data (as low as 85 percent) have been accepted for most data sets with the current method. The iterative process of reestablishing the upper and lower limits after rejection of outliers results in ever tighter bounds and large quantities of data being thrown out.

Concentration Based Analysis. Statistical analysis is performed on the concentrations, which is highly dependent on wastewater flow. Since loading is directly tied to billing, it should be used as the basis for the statistical analysis. Figure 4-2 shows a COD probability distribution curve based on loading for Sampling Location CV2, indicating which points were accepted or rejected using the current concentration-based methodology. Data points shown as black dots (•) indicate the loading numbers calculated based on COD concentrations that were accepted based on the current methodology. Data points shown as red dots (•) indicate the loading numbers calculated based on COD concentrations rejected under the current methodology. As shown on the figure, some calculated loading values outside of the lower (2.5 percent) and upper (97.5 percent) boundaries are not rejected while some calculated loading values that are within the acceptable data range are rejected using the current concentration-based methodology.

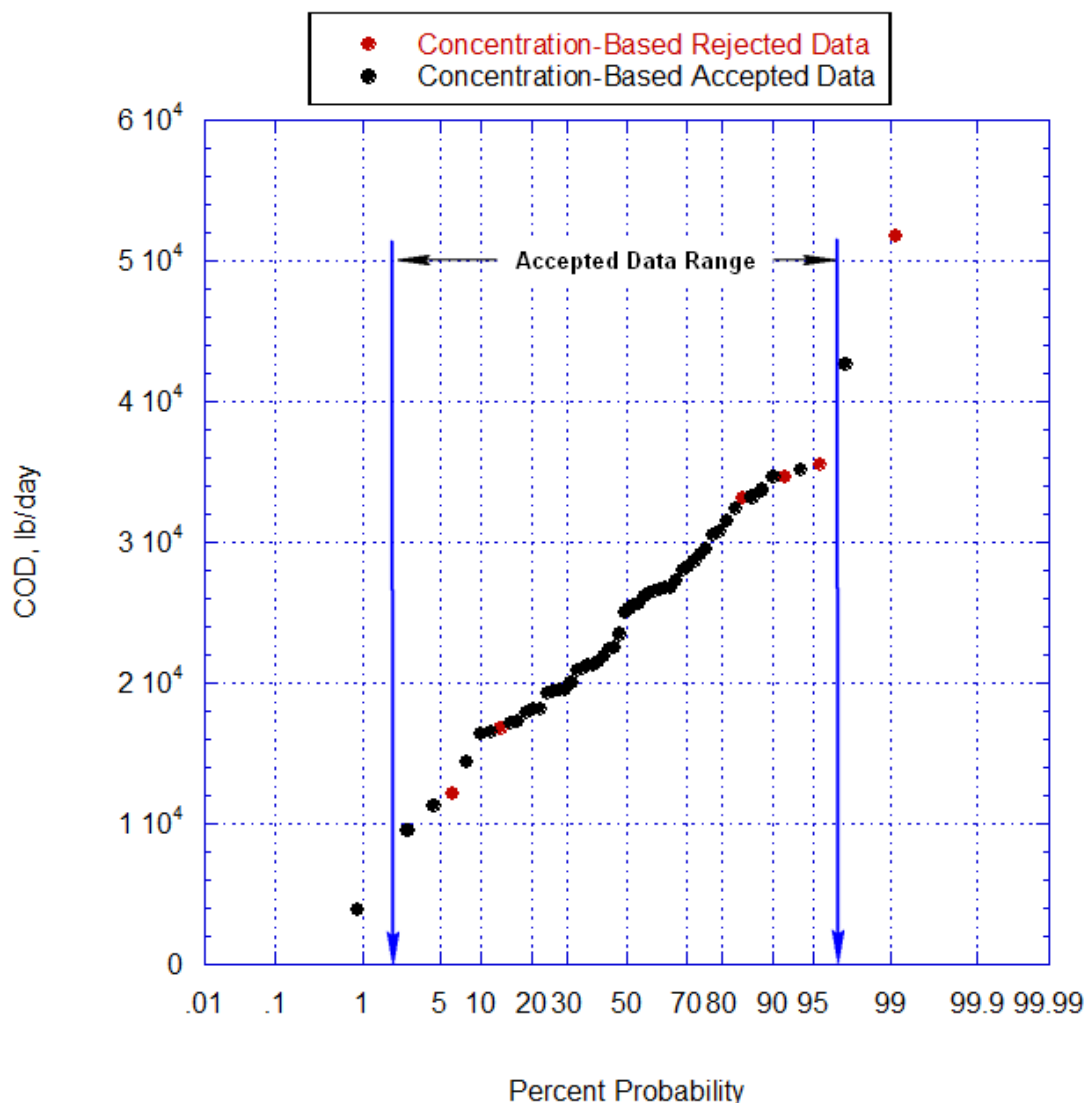


Figure 4-2. COD Loading Percentile Data Probability Plot for at Sampling Location CV2

4.2.3 Suggested Alternative Statistical Data Evaluation Method

Several alternate methods based on concentration and loading were evaluated. Results are summarized in Table 4-1 for COD data analysis for sampling location CV2 as an example. The first method presented in the table calculates the flow-weighted average COD concentration based on all the data points without rejecting any. The rest of the methods presented in the table reject some percentage of the data from top and bottom. Results are comparable for all methods except the first method listed in Table 4-1 where no data is rejected. In general, the flow-weighted average does not change significantly once the highest or lowest few points are discarded.

Table 4-1. COD Data Evaluation Results with Alternate Statistical Analysis Methods for CV2

Evaluation Basis	Reject Top and Bottom	Assumed Data Distribution	Number of Data Points Accepted	Percentage of Data Points Accepted	Flow-Weighted Average Concentration of Accepted Data

Table 4-1. COD Data Evaluation Results with Alternate Statistical Analysis Methods for CV2

Evaluation Basis	Reject Top and Bottom	Assumed Data Distribution	Number of Data Points Accepted	Percentage of Data Points Accepted	Flow-Weighted Average Concentration of Accepted Data
Concentration	None	--	56	100%	634
Concentration	2.5%, iterative	Normal	50	89%	618
Concentration	5%, iterative	Normal	32	57%	613
Loading	2.5%, iterative	Normal	50	89%	624
Loading	2.5% on whole data set	Normal	53	95%	621
Loading	5% on whole data set	Normal	52	93%	621
Loading	2.5%, iterative	Lognormal	49	88%	607
Loading	5% on whole data set	Lognormal	52	93%	604

As noted before, loading is directly tied to billing making it more appropriate as the basis for the statistical analysis. We recommend rejecting concentration values where their associated loadings have been determined to be outliers. Some loading distributions appear to fit normal distribution while others fit a lognormal distribution. Since there is no consistency in the data distribution trend, we recommend continuing to use the normal distribution assumption for simplicity. It is a better approach for rejecting some percentage of the data from the whole data set instead of throwing data iteratively until the data distribution follows the normal distribution. This results in throwing more data than what is intended and could lead to throwing steadily increasing concentration data due to conservation. Therefore, it is suggested that the upper and lower bounds for data rejection be established based on the entire data set, without recalculating after some data are rejected.

After analyzing few a data sets, it was noted that setting the lower and upper boundaries to 5 percent of the top and bottom of the whole data set generally captures the outliers in the data set better than setting them to 2.5 percent. This would capture 90 percent of the data and throw 10 percent (5 percent from the top and 5 percent from the bottom). The yellow highlighted row in Table 4-1 shows the results with the proposed revised statistical analysis method. For reference, the gray highlighted row shows the results with the current statistical analysis.

The current statistical method should be revised as described below:

- Step 1.** Calculate loadings in pounds per day (lb/day).
- Step 2.** Calculate the mean and standard deviation of the loading data.
- Step 3.** Calculate a lower and upper bound assuming a normal distribution using the NORMINV function in Excel. The probability used in the function is 5 percent for lower bound and 95 percent for upper bound (accepting 90 percent of the data).
- Step 4.** Reject any loading outside of the lower and upper bound.
- Step 5.** Calculate a flow-weighted average concentration based on the accepted data points only. This is the concentration used for the site.

4.3 Calculation of the Agency Representative Wastewater Strength Data

Under the current methodology, COD and TSS concentrations are determined for each location where wastewater sampling is conducted. The concentrations that are ultimately accepted and used result from the analytical evaluation described previously. For agencies with multiple discharge points, concentrations determined at sampling locations are used to estimate the loading at locations where only flow metering is conducted or where the flow is estimated based on house counts. This calculation is done in two ways, depending on the type of inter-agency loadings involved:

1. For agencies where the inter-agency loadings are expected to be similar in strength, the calculations are simplified and the representative COD and TSS concentrations are defined as flow-weighted average of the COD and TSS data at the sampling locations. Representative COD and TSS concentrations for Chula Vista, Del Mar, Imperial Beach, La Mesa, National City and San Diego are calculated based on this concept.
2. For agencies where the inter-agency loadings are expected to be significantly different in strength, loadings from the inter-agency flows are subtracted from the calculated agency loadings. The representative COD and TSS concentrations are then calculated based on the net agency flow. Representative COD and TSS concentrations for Coronado, El Cajon, Padre Dam and Spring Valley are calculated based on this concept. Navy Base flows and loads are subtracted from Coronado flows and loads while Lakeside/Alpine and Winter Gardens (County of San Diego) flows and loads are subtracted from El Cajon and Padre Dam flows and loads, respectively. Similarly, Otay WD loads, including the waste solids from the RWCWRF, are subtracted from the Spring Valley loads as explained in Section 3.3.

No issues have been noted with these two approaches for calculating the representative wastewater strength data for agencies. However, concurrent sampling and monitoring at the sampling locations for agencies where the agency representative wastewater strength is calculated based on the second approach is strongly recommended to maintain direct correlation between data used for estimating the agency's contributions.

This would require sampling Navy Base and Coronado (C1M and C3), Lakeside/Alpine and Padre Dam (LS2 and PD1B), and Winter Gardens and El Cajon (WG1M and EC1) sampling locations concurrently. Concurrent sampling for discharges to the Spring Valley trunk sewer can be challenging since there are many inter-agency discharges. However, the two major inter-agency contributors are cities of San Diego and Chula Vista. As suggested in Section 3.3, wastewater characterization sampling at the San Diego metering location BO1,

and at two Chula Vista metering locations (CV7 and one of either CV10, CV12, or CV9) can be implemented to better define the characteristics of wastewater from these agencies. When this happens, concurrent sampling at SV8, BO1, and the two Chula Vista sampling locations is recommended.

5. Evaluation of a Representative Time Period for Load Calculations

Based on the current agreement, the City uses the average of the historical TSS and COD recorded from 1995 to present for billing. Concerns have been raised regarding averaging more than 15 years of data and whether it is appropriate to represent the current wastewater strength. Many have suggested modifying the process. Presented in this section are results from the analysis of the historical flow and concentration trends to determine a more representative time period for performing the loading calculations for billing.

5.1 Net Agency Flow Trends

Calculated net agency flows based on the billing meters data were obtained from the City for FY 1988 to FY 2011 to analyze the wastewater flow trends over time. Historical wastewater trends for PAs and the City are shown on Figures 5-1 and 5-2, respectively. No flow data were available for FY 2004 and FY 2005 since no reliable data were collected during this time period by the flow monitoring contractor.

As seen on Figure 5-1, a major change in wastewater flows was noted for Chula Vista and Spring Valley in 2000. Compared to the previous year, Chula Vista flow increased by 4 mgd while Spring Valley flow decreased by the same amount. The reason for this change was that FY 2000 was the first year inter-agency flows adjustments were applied. This adjustment did not seem to dramatically affect the net wastewater flows for the other PAs.

The historical wastewater flow trend varies for each agency, but it is generally in a stable or decreasing pattern after 2006 potentially due to conservation. The cities of Chula Vista, El Cajon, National City, Coronado and San Diego experienced steady decrease in wastewater generation after 2006 while some increase in wastewater generation was observed for Spring Valley. Overall, the total Metro System flow has been decreasing since 2006. For example, the total Metro System flow in FY 2011 was about 8 percent lower than the total flow recorded for FY 2006.

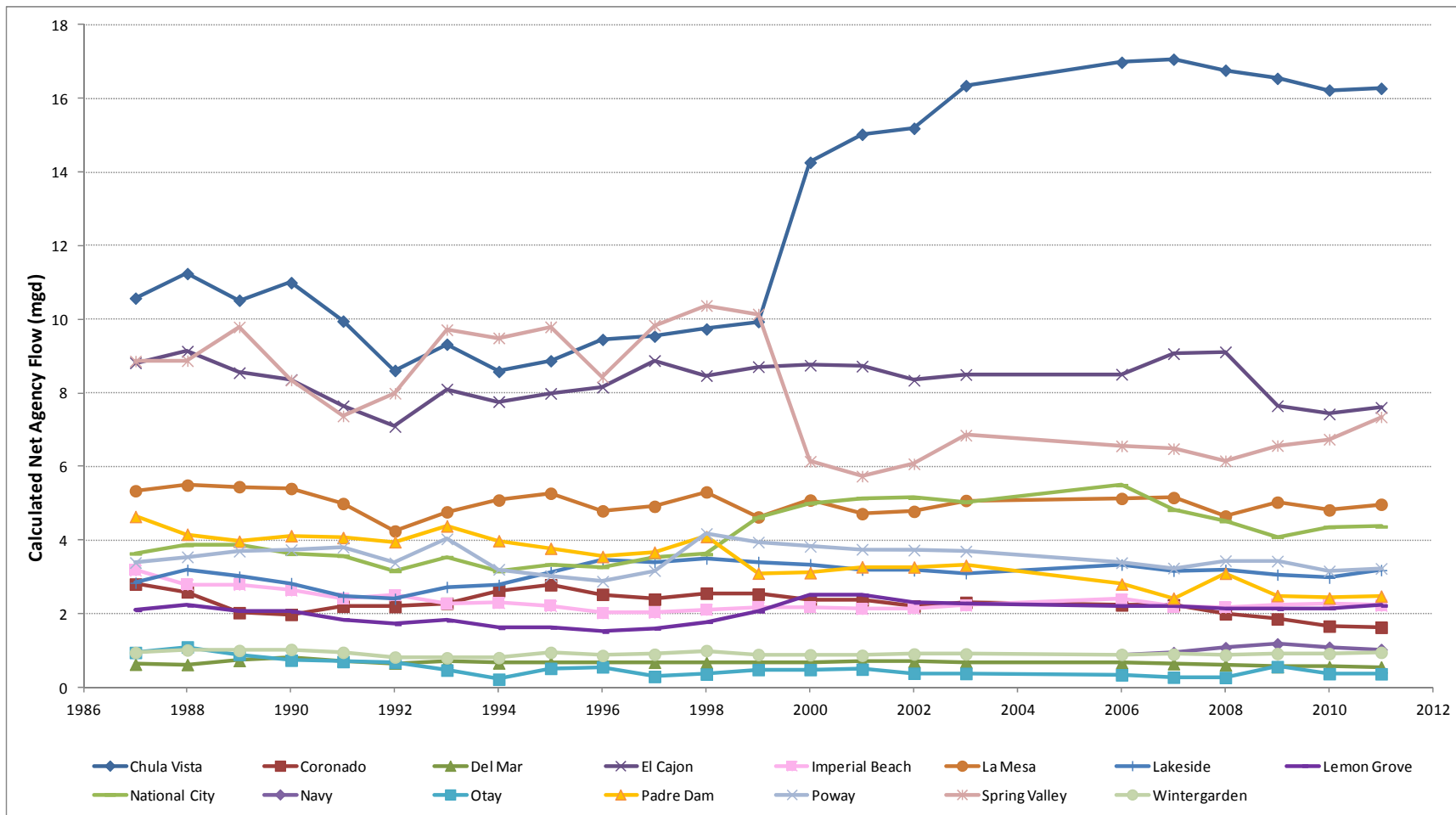


Figure 5-1. Participating Agencies' Historical Net Wastewater Production

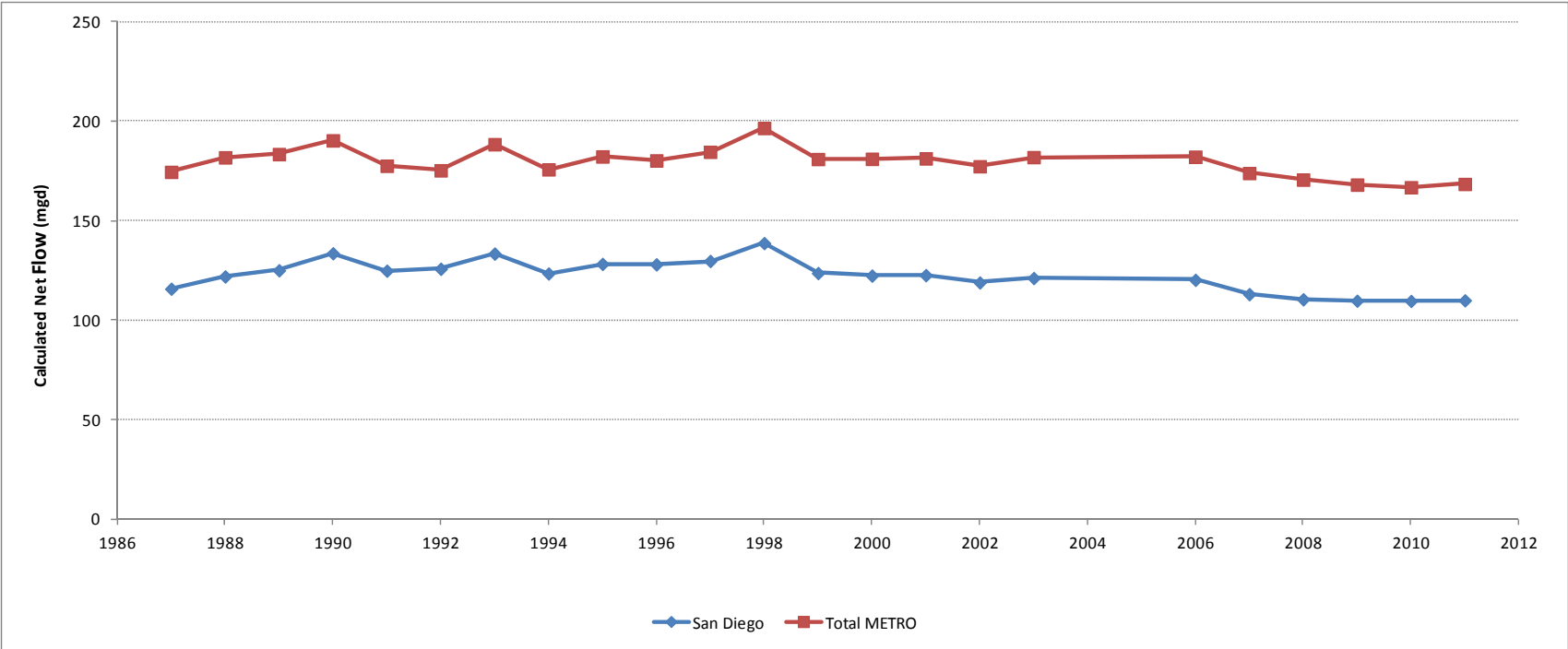


Figure 5-2. City of San Diego's Historical Net Wastewater Production

5.2 COD and TSS Concentration Trends

Historical flow and COD and TSS concentrations measured at the sampling locations were analyzed for trends over time. Table 5-1 exhibits as arrows the general trend in historical flow, COD and TSS concentrations measured at the sampling locations used for load calculations for each PAs and City of San Diego for the sampling period shown. As seen in Table 5-1, a decreasing flow and increasing COD and TSS concentration trends are noted for most agencies, while no obvious changes have been noted for a few of them. The decreasing flow and increasing concentration trends are likely a consequence of water conservation.

Table 5-1. Sampling Locations Used for Load Determinations and Observed Trends in Flow, COD and TSS Concentrations					
Participating Agency	Sampling Location	Sampling Period	Flow Trend	COD Concentration Trend	TSS Concentration Trend
Chula Vista	CV1	1995 to present	▼	▲	▲
	CV2	1995 to present	▼	▲	▲
Coronado	C1M	1997 to present	▼	▲	▲
	C3	1996 to present	▼	▲	▲
Del Mar	DM1	1996 to 2011	●	●	●
	DM2	1996 to present	●	●	●
El Cajon	EC1	1995 to present	▼	▲	▲
	WG1M	1995 to present	▼	▲	▲
Imperial Beach	IBM3	1995 to present	●	●	●
	IB1	1995 to present	●	●	●
La Mesa	LM1	1995 to 1999	●	●	●
	LM1A	2001 to present	●	●	●
	LM3	1995 to present	●	●	●
	LM7	2001 to present	●	●	●
Lemon Grove	LG1	1995 to present	▼	▲	●
National City	NC1	1995 to 2003	▼	▲	▲
	NC3A	1996 to present	▼	▲	▲
	NC5	1995 to present	▼	▲	▲
Padre Dam	PD1B	1995 to present	▼	▲	▲
	LS2	1995 to present	▼	▲	▲
Poway	PO2	1995 to present	●	●	●
Lakeside/ Alpine	LS2	1995 to present	▼	▲	▲
Spring Valley	SV8	1995 to present	●	●	●
Winter Gardens	WG1M	1995 to present	●	●	●

Table 5-1. Sampling Locations Used for Load Determinations and Observed Trends in Flow, COD and TSS Concentrations

Participating Agency	Sampling Location	Sampling Period	Flow Trend	COD Concentration Trend	TSS Concentration Trend
San Diego	SD1A	1996 to 2003	▼	▲	▲
	SD1D	1996 to 2003			
	SD1E	1996 to 1997 and 2006 to present			
	SD1F	1996 to 2006			
	SD2A	1996 to present			
	SD3	1996 to 2009			
	SD5	1996 to 1997 and 2006 to present			
	SD7A	1996 to present			
	SD8	1996 to present			
	SD9	1996 to present			
	SD10	1996 to present			
	SD11	1996 to present			
	SD12	1996 to present			
	SD33	2006 to present			
	SD40	2006 to present			

Legend(s)

- Increasing Trend



- Decreasing Trend



- Stable, insignificant change observed

5.3 Issues with Using Historical Data Averaging

The following issues have been noted with the current historical data averaging approach:

Effect of Water Conservation. Due to recent drought conditions, implementation of water conservation practices has increased and its affect has been noticeable in flows and wastewater strength as explained in Sections 5.1 and 5.2. Averaging the last 15 years data does not necessarily reflect the current wastewater strength for most of the agencies.

Discontinued Sampling Locations. Over the years, a few sampling locations were eliminated due to flow consolidation, safety issues related to traffic and site access, or poor hydraulic conditions at the sampling location. However, historical data collected at these eliminated sampling locations are still being used for calculating the representative wastewater strength for agencies. As seen in Table 5-1, the City of San Diego, for example, used to sample at sampling locations SD1A, SD1D and SD1F; but discontinued the sampling in 2003. Historical data collected at these sites are still being used to calculate the flow-weighted average COD and TSS concentrations to represent the City's wastewater strength today. This practice could produce wastewater strength data that does not represent the current conditions and therefore should be revised. It is recommended to stop using the data collected at the discontinued sampling locations after collecting one to two years data at the new replacement sampling location.

Flow Diversions. Wastewater flows dramatically reduced at two locations due to flow diversions. Averaging the flows and loadings at these locations would not be representative of current conditions. Some examples:

- Sampling location SD7a receives wastewater from the City of Coronado in addition to the City's customers. A diversion structure is used to divert Coronado flows to sampling location SD7a. In 2006, the meter was relocated to location SD7c. As seen on Figure 5-3, the measured flow at SD7a reduced by half after the flow diversion. Using the historical average to determine flow contribution at this location provides an overestimated value today.
- Wastewater flows reaching sampling location SD11 has steadily been diverted to the Grove Avenue Pump Station to provide flow to the South Bay Water Reclamation Plant. The effect of the diversion can be seen on Figure 5-4. Current flows and loadings at SD11 are about 10 percent of the values reported prior to 1999. The use of historical flows skews the average flows assigned to this location.

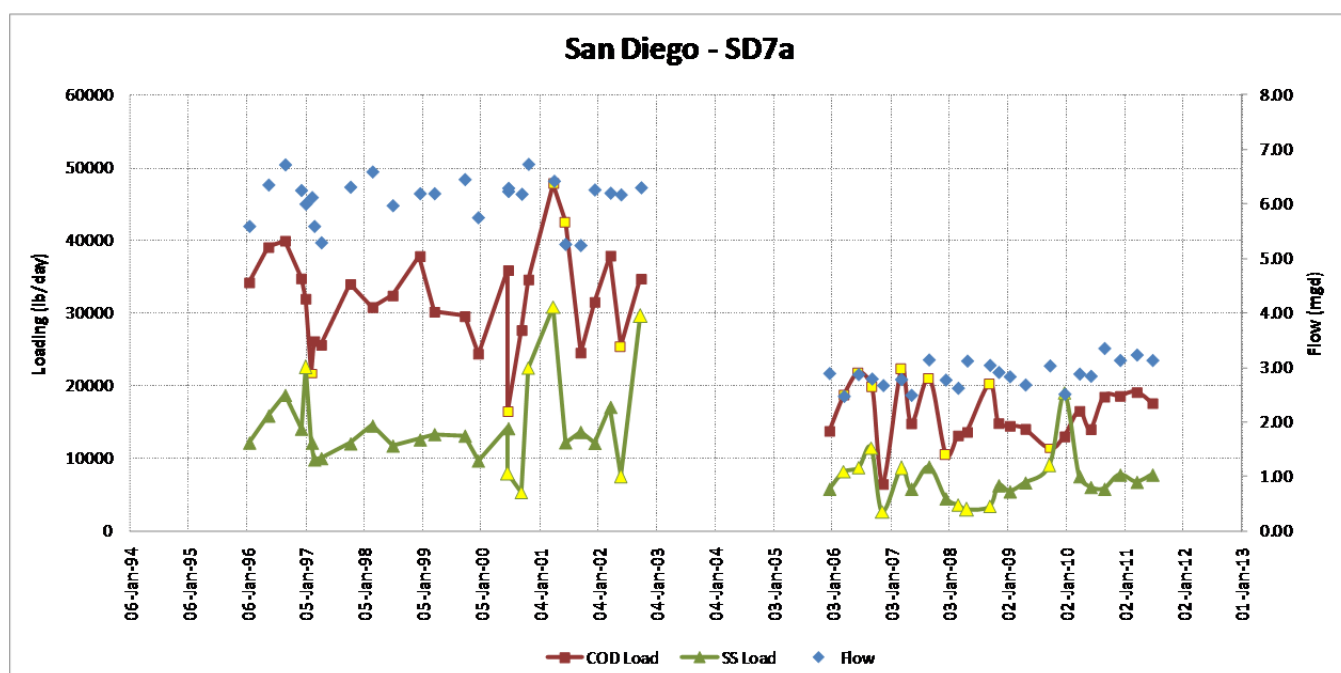


Figure 5-3. Historical Flow and COD and TSS Loadings Recorded at SD7A

Note: Yellow data points represent the COD and TSS data thrown out as a result of statistical evaluation that eliminates outliers

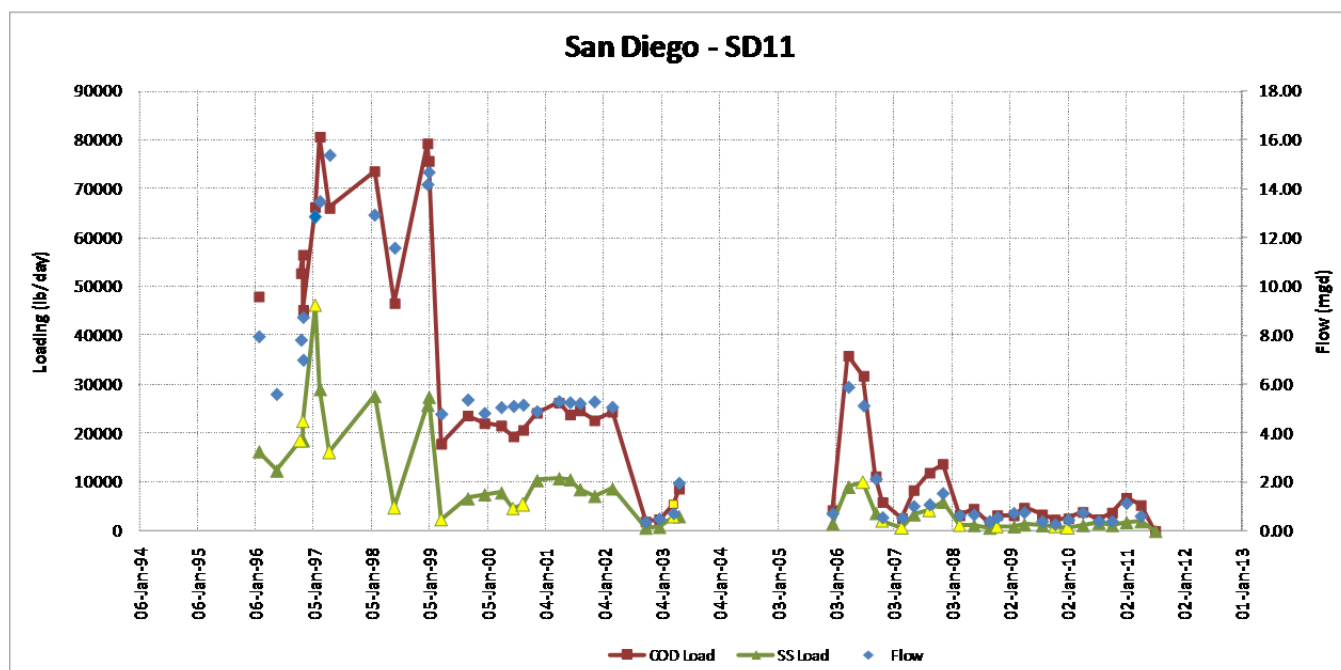


Figure 5-4. Historical Flow and COD and TSS Loadings Recorded at SD11

Note: Yellow data points represent the COD and TSS data thrown out as a result of statistical evaluation that results in elimination of outliers

Different Number of Data Points. As seen on Table 5-1, different number of data points has been collected over the years at each sampling location. Over 50 data points have been collected at most sampling locations whereas only 15 data points have been captured for a few where the sampling program started more recently (in 2006). This means different size data sets are used for the statistical evaluation currently. Some data sets have more than three times more data points than the others. The sample size impacts the statistical evaluation. Fewer samples result in higher potential for the calculated mean to deviate from the actual mean (if more data points exist).

Flow Metering Improvements. ADS has been contracted to meter the flows at all the stations since 1996. From FY 2004 to 2005, a different contractor (Geotivity) began providing that service. The City discovered that the data provided by Geotivity were unreliable and could not be used for billing. The City used the Point Loma, North City and South Bay meters at the plants for billing during this period. The FY 2004 total flow was very close to the FY 2003 total flow so each agencies percentage of flow from FY 2003 figures were applied to both FY 2004 and FY 2005. FY 2005 was an El Nino year so the total flow was much higher than FY 2003 or FY 2004. Flows assigned to the PAs were estimated using percentages established from previous data. All PAs agreed to the approach for FY 2004 and FY 2005.

In 2006, the City re-initiated the contract with ADS who has been providing the metering service since then. ADS indicated that they improved the algorithms to smoothen out readings and eliminate outliers. This may explain the more consistent data recorded after 2006 as compared to the erratic fluctuation observed prior to 2003.

5.4 Recommended Representative Time Period

In order to eliminate the shortcomings explained above, it is recommended to use the latest 5-year running average instead of averaging the historical data. Using a 5-year running average will ensure that the data used for billing better represents current conditions. The currently practice of quarterly sampling produces 20 data points over a five year period. This is considered adequate. The use of a shorter averaging time,

such as a 3-year running average as suggested by a PA, was considered. However, it was found that this will reduce the number of data points, particularly if a few outliers are removed from the data set. The 5-year running average is considered to be the optimal time frame.

Similar to what is practiced by the City of LA, the City may consider sampling new dischargers for the first two years monthly or bi-monthly and rely on quarterly sampling during subsequent years. Increased sampling frequency could also be temporarily instituted if the wastewater characteristics (flow or strength) have drastically changed at an existing location due to flow diversion or the addition or deletion of a significant tributary discharge. It has also been suggested that this intensive sampling program be instituted for the first two years if significant changes to the current billing and sampling/monitoring protocol are made.

Table 5-2 provides a comparison of the calculated COD and TSS loadings based on loading-based statistical evaluation (the revised methodology described in Section 4.2) and the latest 5-year data versus the COD and TSS loadings calculated based on the current concentration-based statistical evaluation and the historical data up to FY 2011. FY 2011 net agency flows were used to calculate the loadings.

Table 5-2. COD and TSS Loading Contributions from Participating Agencies for FY 2011 based on the Current and the Proposed New Method						
Participating Agency	Calculated Loadings Based on Historical Average and Concentration Based Statistical Evaluation ^a		Calculated Loadings Based on the Latest 5-year Data and Loading Based Statistical Evaluation ^b		Percent Difference	
	COD (1000 lb/yr)	TSS (1000 lb/yr)	COD (1000 lb/yr)	TSS (1000 lb/yr)	For COD	For TSS
Chula Vista	31,954	11,008	34,013	12,820	6%	16%
Coronado	2,381	681	2,461	849	3%	25%
Del Mar	1,002	411	915	398	-9%	-3%
East Otay Mesa	8	1	19	6	135%	960%
El Cajon	11,507	3,718	11,146	3,505	-3%	-6%
Imperial Beach	3,490	1,344	3,585	1,482	3%	10%
La Mesa	7,301	2,590	7,395	2,801	1%	8%
Lakeside/ Alpine	4,551	1,649	4,863	1,942	7%	18%
Lemon Grove	3,590	1,086	3,673	1,011	2%	-7%
National City	8,152	2,590	8,264	2,630	1%	2%
Otay	1,230	1,217	1,230	1,217	0%	0%
Padre Dam	5,270	2,220	5,711	2,633	8%	19%
Poway	4,782	1,993	5,556	2,558	16%	28%

**Table 5-2. COD and TSS Loading Contributions from Participating Agencies for FY 2011
based on the Current and the Proposed New Method**

Participating Agency	Calculated Loadings Based on Historical Average and Concentration Based Statistical Evaluation ^a		Calculated Loadings Based on the Latest 5-year Data and Loading Based Statistical Evaluation ^b		Percent Difference	
	COD (1000 lb/yr)	TSS (1000 lb/yr)	COD (1000 lb/yr)	TSS (1000 lb/yr)	For COD	For TSS
Spring Valley	11,479	4,307	12,812	4,595	12%	7%
Winter Gardens	1,180	446	1,266	497	7%	11%
San Diego	215,503	73,025	250,619	91,721	16%	26%

a. Historical data includes FY 2011 data from 1995 to June 30 of 2011 as provided to BC.

b. Does not include data from sampling locations discontinued prior to 2006. The latest 5-year data set includes the data collected from September 2006 to June 2011.

The third column of Table 5-2, showing the values based on the loading-based statistical data evaluation and the latest 5 year data, also reflects the recommendations made in this TM (refer to Section 3.3 for East Otay Mesa loadings calculations and Section 2.1.1 for San Diego flow adjustment). As explained in the relevant sections, Lakeside/Alpine average COD and TSS concentrations were used to estimate the loadings from 32.2 EDUs in East Otay Mesa and the North City WRP recycled water flow was added to the net San Diego flow to capture the San Diego's flow generation in the North City basin properly.

Highlighted values on the last column of the table show occasions when difference in calculated loadings with the new methodology are more than 10 percent of the loadings calculated with the current methodology. The main reason of the change in the loadings is the change in the concentration values.

Table 5-3 presents how the revised TSS and COD loadings affect the overall cost share among agencies for FY2011. The first column shows the percent overall cost share for agencies based on historical average TSS and COD loadings (current method). The second column shows the percent overall cost share for agencies based on the latest 5-year TSS and COD data (proposed new method). The last column presents the difference in cost share for an agency based on the two different data evaluation methods.

**Table 5-3. Difference in Overall Cost Share Among Agencies in FY 2011
based on the Current and Proposed New Methods of TSS and COD Data Evaluation**

Participating Agency	Overall Percent Cost Share Based on Historical Average and Concentration Based Statistical Evaluation ^a	Overall Cost Share Based on the Latest 5-year Concentration Data and Loading Based Statistical Evaluation ^b	Difference
Chula Vista	10.07%	9.66%	-0.41%
Coronado	0.79%	0.77%	-0.02%
Del Mar	0.35%	0.30%	-0.05%
East Otay Mesa	0.01%	0.01%	0.00%

**Table 5-3. Difference in Overall Cost Share Among Agencies in FY 2011
based on the Current and Proposed New Methods of TSS and COD Data Evaluation**

Participating Agency	Overall Percent Cost Share Based on Historical Average and Concentration Based Statistical Evaluation ^a	Overall Cost Share Based on the Latest 5-year Concentration Data and Loading Based Statistical Evaluation ^b	Difference
El Cajon	3.91%	3.44%	-0.47%
Imperial Beach	1.24%	1.15%	-0.08%
La Mesa	2.58%	2.39%	-0.19%
Lakeside/ Alpine	1.64%	1.58%	-0.06%
Lemon Grove	1.17%	1.04%	-0.13%
National City	2.55%	2.31%	-0.24%
Otay	0.58%	0.50%	-0.08%
Padre Dam	1.75%	1.70%	-0.05%
Poway	1.78%	1.81%	0.03%
Spring Valley	4.03%	3.82%	-0.21%
Winter Gardens	0.46%	0.43%	-0.02%
San Diego	67.12%	69.10%	1.98%

a. Historical data includes FY 2011 data from 1995 to June 30 of 2011 as provided to BC.

b. Does not include data from sampling locations discontinued prior to 2006. The latest 5-year data set includes the data collected from September 2006 to June 2011.

As seen from Table 5-3, increase in cost shares are highlighted in blue. Overall cost shares by the City is projected to increase by 1.98 percent while PAs overall cost share decreased slightly, except for Poway. San Diego's loadings increased more than other PA's because not only the San Diego's wastewater strength increased based on latest 5-year data evaluation with the new method, but also its net flow contribution increased by about 5 mgd to better estimate the wastewater generation in the North City basin. Therefore, since San Diego's cost share increased, other PAs' cost share decreased to balance the change.

6. Review of Practices in Similar Agencies

Billing practices of two agencies of similar size and complexities were reviewed. The objective was to report the billing methods practiced in other, similar agencies. Information gathered may lead to recommending improvements to the Metro billing methodology. The two agencies evaluated under this task include Orange County Sanitation District and the City of Los Angeles.

6.1 Orange County Sanitation District

The Orange County Sanitation District (OCSD) is responsible for collecting, treating and disposing the wastewater generated by approximately 2.5 million people living in a 479-square-mile area of central and northwest Orange County. The OCSD operates and maintains two treatment/reclamation plants, 17 pump stations, and 587 miles of sewers. The Sanitation District was originally incorporated in 1954 as nine separate districts. In 1998, the Board of Supervisors of the County of Orange passed a resolution ordering the consolidation of these nine sanitation districts into a new, single sanitation district, to be known as OCSD. OCSD is made up of two revenue areas: Consolidated Revenue Area and Revenue Area No. 14. Consolidated Revenue Area services 23 cities, two special districts and unincorporated county areas; and Revenue Area No. 14 (District 14) provides services to three cities and Irvine Ranch Water District (IRWD).

OCSD is managed by an administrative organization composed of directors appointed by the agencies or cities which are serviced by OCSD. OCSD receives a portion of the one-percent ad valorem property tax levy. In addition, OCSD collects its revenue from the users of the system in proportion to their use as indicated by each users loadings measured by flow, BOD and TSS. These sewer service fees are comprised of residential, commercial, and industrial customers and collected through three main charge programs as described below.

Sanitary Sewer Service Charge. The owner of each parcel of residential, commercial, or industrial property located within OCSD and connected to OCSD's system pays annual sanitary sewer service charges. Fee for residential users, including single family and multi family users, are determined and collected through annual property taxes. The rates for commercial and industrial customers are derived from the base sewer service fee charged to a single-family residence by multiplying a predetermined percentage figure for a particular use classification to arrive at the annual sewer service charge rate per 1,000 square feet for the commercial or industrial user. The rates for commercial and industrial customers are also collected through annual property taxes.

Capital Facilities Connection Charge. This is a one-time charge imposed when a building or structure is newly connected to OCSD's system or when an existing structure or category of use is expanded or increased. The payment is required at the time of issuance of the building permit for all construction within OCSD. In addition to the base capital facilities capacity charge, significant commercial or industrial users pay a Supplemental Capital Facilities Capacity Charge for each gallon of flow, or pound of BOD or TSS, exceeding the base use discharge maximums. The base discharge maximums are defined as sewage flow of 25,000 gpd, BOD greater than 150 lb/day, and TSS greater than 150 lb/day.

Industrial Waste Permit User Fees. A Class I user is defined as any user that discharges wastewater that is subject to Federal Categorical Pretreatment Standards; or averages 25,000 gpd or more regulated process water and is determined to have a reasonable potential for adversely affecting OCSD's operation or for violating any pretreatment standard, local limit or discharge requirements. Class II users are any industrial users that discharges wastes other than sanitary, and that is not otherwise required to obtain a Class I permit. The rates for Class I and Class II permittees are derived from the base sewer service fee charged to a single-family residence and are based on the type of business and the strength and volume of waste that is discharged into the sewer system. The charge for use for Class I and II users are computed by the following equation:

(Equation 15) Charge for Use = $V_oV + B_oB + S_oS - \text{Tax Credit}$

where:

V = total annual volume of flow, in million of gallons

B = total annual discharge of BOD, in thousands of pounds

S = total annual discharge of TSS, in thousands of pounds

V_o, B_o, S_o = unit charge rates established based on the funding requirements of providing sewer services, in dollars per million gallons for flow, and in dollars per thousands of pounds for BOD and TSS, respectively.

Tax credit = annual Sewer Service Charge on the property tax bill.

Properties located within Revenue Area No. 14 do not pay annual sewer service fees or capital facilities connection charges. OCSD costs relating to providing service to these properties are billed by OCSD directly to IRWD, the local agency providing the local sewer services. IRWD discharges treated effluent to OCSD facilities. IRWD is charged for this service based on flow. In addition, IRWD pays OCSD a solids handling charge which include IRWD's share of the cost of annual capital and operating and maintaining the existing facilities for treatment of solids.

Additionally, the Santa Ana Watershed Project Authority discharges sewage and brine to the OCSD system and is charged based on flow and TSS.

Each year OCSD's Board of Directors adopts an annual operating plan with a budget that identifies the specific capital projects and operating activities to be undertaken by OCSD that year. Sewer user fees are evaluated annually based primarily on budget requirements for total operation, maintenance and capital expenditures for providing wastewater management services. Property tax revenues are dedicated for the payment of debt service (OCSD 2011).

6.2 City of Los Angeles

The City of LA is responsible for the collection, treatment, disposal, and reclamation of wastewater generated by residential, commercial and industrial users within the City of LA and 29 surrounding communities and agencies (Contract Agencies). This system includes 6,700 miles of sewers, 44 pump stations, three water reclamation facilities (WRFs), and a secondary wastewater treatment plant (City of LA 2011). Sludge from two of the WRFs is discharged back to the sewer for treatment at the downstream secondary facility. Unused recycled water is discharged to the LA River.

The City's revenue requirement is projected for the capital and operation and maintenance costs of the sewer system. The City uses a sewer service charge (SSC) to recover the costs from users of the system based on their proportionate contribution of wastewater flow and strength to the system. The City's residential and commercial users pay the SSC through their LA Department of Water and Power bill. The amount varies according to volume, based on "domestic strength" flow. The City has defined domestic strength as having a BOD of 265 mg/L and a TSS of 275 mg/L. This definition was determined using a system-wide mass balance calculation. The calculation included wastewater flows and loadings at the treatment plants, subtracting sludge return flows, I&I, and industrial and commercial discharges.

Industrial users with wastewater strength greater than domestic strength are charged Quality Surcharge Fees for their BOD and TSS in excess of the domestic values. Low strength industrial users are charged special low-strength SSC. New development and existing users with increase use of the wastewater system pay one-time Sewerage Facilities Charges to recover the costs of constructing the wastewater treatment and conveyance capacity needed for the new or expanded service.

Twenty of the 29 Contract Agencies that discharge to the City of LA's system are charged Amalgamated System SSCs (ASSSCs). The agencies are charged for each year's service based on the actual costs of providing the service. The charges are similar to the internal-City SSCs, with the differences accounting for the different services provided to the particular agency. For example, the agencies do not participate in the City's bonds. Therefore, they are not required to pay debt service, but do pay for capital on a cash basis. The charges include costs associated with new capital and operation and maintenance. These fees are determined based on flow, BOD and TSS. Flow from each of the Contract Agencies is monitored continuously. The standard agreement with the Contract Agencies requires BOD and TSS to be sampled monthly by each of the Contract Agencies for the first two years of the agreement and every quarter thereafter. The flow is monitored and quality samples are collected at Contract Agency connections that convey 0.5 cubic feet per second (cfs) or greater. For locations under this 0.5 cfs cutoff, flow and strength may be determined by multiplying the number of residences and businesses within their area with a UGR determined by the City. Contract Agencies pay one-time ASSSCs for new development and increased use by existing customers, similar to the Sewerage Facilities Charges paid by internal/Los Angeles users.

The samples are flow- composited and either refrigerated or iced. The agencies then report the sampling results to the City. The agencies' charges are based on the previous 3 years of sampling data (a 3-year rolling average). Three years was chosen somewhat arbitrarily in an effort to use more data points (i.e., 12 if sampling quarterly). Burbank also operates a reclamation facility that discharges solids to the system continuously. Sampling and monitoring is the responsibility of each Contract Agency but the City provides assistance in compiling the results and calculating the net discharges from the agencies.

In addition, the agreement requires Contract Agencies to be charged their proportionate shares of the wastewater conveyance and pumping costs based on their discharges of "MGD Miles." This is a term that was created to describe the process of multiplying an agency flow by the distance to the downstream treatment facility determined by a straight line. This gets complicated because some flow is diverted to upstream WRFs and then the sludge is discharged back to the sewer. The goal of using this method of billing is to account for the difference in cost of conveying each agency's wastewater to the point of treatment.

Each December, the City sends the agencies projections of their charges for the next 5 years to assist the agencies with developing their operating budget. The City uses flow and strength data collected from a "flow year" which is April 1 through March 31 in preparing the agencies' bills. This gives the City three months to calculate bills and issue a bill based on estimated costs to the Contract Agencies in June. The agencies then pay the City every other month based on the estimated bill. In January, following each fiscal year, the City issues a reconciliation bill that proportions fees based on the actual costs and updated flows and sampling results.

The City does not have a different fee schedule based on what part of the system you discharge to; i.e., the total cost is shared regardless of the what treatment facility their discharge is treated at. The fee schedule is the same whether an agency's discharge is treated at the Hyperion Treatment Plant, the Terminal Island Treatment Plant, or one of the upstream reclamation plants. In addition, the City uses a cost accounting system that allows them to track treatment cost by process. This allows the City to assign costs depending on how the flow and load from an agency impacts the cost of operating and maintaining a process at each plant. For example, the O&M and capital improvements at the treatment plants are tracked based on the process they are associated with (i.e., primary, secondary, tertiary, etc.). Therefore, the City of LA can charge the agencies according to the quality of their discharge and the impact it will have on the treatment process.

6.3 Elements from Other Agencies Billing Practices that can be Applied to San Diego

Listed below are potential considerations for augmenting or modifying the City's billing practices based on practices exercised in the two agencies reviewed.

- Consider increasing the frequency of sampling to monthly or bi-monthly for the first 1 to 2 years for new dischargers and reducing it to quarterly sampling during subsequent years.
- Consider a similar increased sampling frequency when the wastewater characteristic at an existing monitoring location is expected to change because of the addition or deletion of a significant tributary discharge or if flow diversion occurs.
- Consider reducing the averaging times to 3 to 5 years rather than using the entire historical data set.

7. Conclusions and Recommendations

The conclusions and recommendations discussed in this TM are summarized in Table 7-1.

Table 7.1 Summary of Conclusions and Recommendations

Category	Findings/Conclusions	Recommendations
Flow Measurement Locations	Unmetered flow contribution is significant for some agencies.	For consistency, the City can continue to use its current criteria for installing flow meters in sewers where the flow reaches or surpasses 0.2 mgd (which is 750 EDU based on UGR of 265 gpd/EDU) to determine which area should be metered. Each affected PA should collaborate with the City in determining the appropriate metering location.
	The current Unit Generation Rate (UGR) value of 265 gpd/EDU applied to unmetered areas is appropriate for most areas. UGRs can differ between agencies, depending on the water conservation and general water use practices followed by neighborhoods and the tightness of the pipeline to prevent infiltration and inflow (I/I).	UGRs should be re-evaluated periodically to determine if currently applied values continue to be representative of the last 5 years. Confidence in flow calculations for unmetered areas can increase and it may eliminate the need to install costly metering locations. PA's could independently conduct studies to determine the appropriate UGRs specific to their service areas and seek an agreement with the City to use a different UGR value for unmetered flows in their area.
	The recycled water produced at the North City WRP and distributed to nearby City customers is not considered when determining City flows reaching sample location SD1B. In addition MBC centrate should be subtracted as it has been recently done since FY2010.	The recycled water produced at the North City WRP should be added to the San Diego flow determined for SD1B. The flow addition can be done at the end of the year in a same manner the MBC centrate flow deduction is made.
Sampling Locations	Lemon Grove. Due to recent changes in Lemon Grove sewer system, the current sampling location, LG1, represents 9% of the total agency flow; whereas, LG2, which is metered for flow but not sampled, makes up about 46% of the agency flow.	Collect wastewater samples at LG2 instead of LG1 to obtain data that are more representative of flows from Lemon Grove.
	San Diego. The City has 12 sampling locations throughout its main service area. SD11 and SD12 are among the current sampling locations and each represent only 0.6 and 0.2 % of the total City flow, respectively. Comparatively, no wastewater samples are collected from flow metering locations SD19 and SD2B where up to 13 and 3 percent, respectively, of approximately 110 mgd (FY 2011 flow) of the total City flow is passing. Two locations, SD11A and SD18 combined capture the flow of SD11 prior to flow diversion to South Bay Water Reclamation Plant in 2002. This is about 4 mgd or 3.5 percent of the total net City flow. Alternatively, SD11A and SD18 can be included in the monitoring program.	Unless there is a specific reason for these locations to not be sampled, data collected at locations SD19 and SD2B would produce more representative data for San Diego. It is recommended to discontinue monitoring at SD11 and SD12 if monitoring is established at SD19 and SD2B. SD11A and SD18 should be considered for sampling. This change would increase the total number of City-specific sampling locations to 14, but would provide a better representation of City flows. If the City wishes to stay with 12 sampling locations due to cost issues, then we recommend discontinuing sampling at SD2A or SD8 (both contribute only about 1 percent each of the total net City flow).
	National City. National City is mainly comprised of single and multiple family homes with some transport, industrial and commercial land uses. Location NC5, where wastewater samples are collected, represents approximately 19% of the net agency flow. But, the dominant land use type specific to this catchment area is transport. Sampling at a location where the dominant land use type is not residential is not considered a representative location for National City.	The City should consider collecting wastewater samples at NC3B. Wastewater passing through this location comprises about 16% of the total agency flow. In addition, the land use types within its catchment area better represents the majority of National City land uses. Sampling at both NC5 and NC3B is recommended to better represent the National City discharges.

Table 7.1 Summary of Conclusions and Recommendations

Category	Findings/Conclusions	Recommendations
Monitoring of Wastewater from Padre Dam MWD	The results of the short-term sampling and monitoring event conducted in October 2012 suggest that concurrent sampling and monitoring at LS2 and PD1B adequately captures waste streams from the Ray Stoyer WRF and bypass flows at the IPS. It was noted that average COD and TSS concentrations (889 and 433 mg/L, respectively) measured at PD1B during this sampling event were much higher than the historical average COD and TSS concentrations (590 and 236 mg/L, respectively) the City has been using for billing purposes. The difference is considered significant.	Concurrent monitoring of LS2 and PD1B should be performed (without the need to monitor at MSS) since the short-term sampling and monitoring performed under this project proved that LS2 and PD1B, when sampled and monitored concurrently, adequately represents discharges from the Padre Dam MWD.
	Wastewater strength determined at PD2 and at a manhole receiving discharges from Simeon Drive (as part of the 2010 Wastewater Characterization Study conducted by Padre Dam MWD) are about 20 and 30% lower than the COD and TSS concentrations used to represent Padre Dam MWD's wastewater strength in FY 2011 using data based on PD1B. Applying the calculated representative TSS and COD values for wastewater generated downstream of PD1B will result in over estimating loads from these areas.	The best approach to capture the PD1B loads accurately would be to disregard the historical COD and TSS measurements at PD1B and start fresh. In order to form a baseline quickly, a more frequent (monthly or bi-monthly) sampling program can be instituted in the initial 2 years. After collecting about 24 data points, quarterly sampling can be reinstated to reduce cost.
Monitoring of Wastewater from Otay WD	Since 1993, Otay WD estimates the WAS TSS load in the RWCWRF based on plant influent flow according to a guideline found in a textbook. This method was preferred because the waste activated sludge discharge did not have to be analyzed for TSS. Today, Otay WD collects a daily grab of the WAS and analyzes for process control purposes.	Otay WD should report the TSS and BOD loadings associated with the WAS based on measured flow and TSS concentration Otay WD indicated that future reports to the City will utilize measured values in determining loads.
	The current method of assuming BOD load in WAS is half of the TSS load may be conservative; actual BOD load may be less. In addition, the BOD of the screenings is assumed to be equal to its TSS content, which may also be an over estimation.	Otay WD should revise the current textbook-based equations being employed to estimate loadings using actual measured values. They could either continuously take samples of the sludge or perform a short-term sampling program (5 to 10 samples) and analyze it for BOD and TSS to arrive at a TSS to BOD ratio that can be confidently applied for estimating loads.
	Equations used in the current mass balance calculation spreadsheet are set assuming the RWCWRF is on-line all year-long. This setup causes erroneous calculation of the annual TSS and COD concentrations used for loading estimates when the plant is off-line.	BC recommends the City use the average RWCWRF influent concentrations for the days the plant is on-line as reported by the Otay WD, or revise the mass balance calculations to be based on yearly total flows and loads instead of yearly average values. This will eliminate any calculation errors due to plant off-line periods.

Table 7.1 Summary of Conclusions and Recommendations

Category	Findings/Conclusions	Recommendations
Monitoring of Wastewater from County of San Diego	Wastewater contribution from East Otay Mesa to the Metro System was minimal and had not been monitored until 2009. Wastewater TSS and COD concentrations are monitored at a sampling and metering location at the Otay Mesa Energy Center. Average COD and TSS concentrations reported here are used to represent the residential wastewater discharges from Easy Otay Mesa. These concentrations are significantly lower than the typical concentrations observed at other locations in the County with residential flows.	The plan is to re-initiate the sampling program at a more representative sampling location when the flows increase from East Otay Mesa. Meantime, it is suggested to use more representative COD and TSS concentrations for the residential discharges such as the average concentrations reported for Winter Gardens or Lakeside/Alpine.
	Spring Valley SD is neighbored by several agencies, including the cities of El Cajon, La Mesa, Lemon Grove, National City, Chula Vista, and San Diego, and the Otay WD. All the neighboring agencies, except City of El Cajon, discharge wastewater within the district boundaries which is eventually conveyed to the Metro System. Otay WD discharges both sludge and sewer flows bypassed at the RWCWRF and therefore considerably different than typical domestic wastewater. COD and TSS loads contributed by the Otay WD are subtracted from the Spring Valley SD loads. Other significant inter-agency flow contributors include the cities of Chula Vista and San Diego.	Land use types among Spring Valley, Chula Vista, and San Diego communities are not considered significantly different that additional sampling locations are necessary, but load calculations for Spring Valley SD could be refined with additional sampling. BO1 could be sampled to better define the characteristics of wastewater from San Diego while CV7 and another location such as CV10, CV12 or CV 9 could be sampled to characterize Chula Vista discharges.
Calculation of the Agency Representative Wastewater Strength Data	For agencies where the inter-agency loadings are expected to be significantly different in strength, loadings from the inter-agency flows are subtracted from the agency loadings. The representative COD and TSS concentrations are then calculated based on the net agency flow. Representative COD and TSS concentrations for Coronado, El Cajon, Padre Dam and Spring Valley are calculated based on this concept. Navy Base flows and loads are subtracted from Coronado flows and loads while Lakeside/Alpine and Winter Gardens (County of San Diego) flows and loads are subtracted from El Cajon and Padre Dam flows and loads, respectively. Similarly, Otay WD loads, including the waste solids from the RWCWRF, are subtracted from the Spring Valley loads.	Concurrent sampling and monitoring at the sampling locations for Navy Base and Coronado (C1M and C3); Lakeside/Alpine and Padre Dam (LS2 and PD1B); and Winter Gardens and El Cajon (WG1M and EC1) are strongly recommended to maintain direct correlation between data used for estimating the agency's contributions. Concurrent sampling for discharges to the Spring Valley trunk sewer can be challenging since there are many inter-agency discharges. However, the two major contributors are cities of San Diego and Chula Vista. As suggested earlier, wastewater characterization sampling at the San Diego metering location BO1, and at two Chula Vista metering locations (CV7 and one of either CV10, CV12, or CV 9) can be implemented to better define the characteristics of wastewater from there agencies. When this happens, concurrent sampling at SV8, BO1, and the two Chula Vista sampling locations is recommended.
Sampling and Analysis Procedures	Analysis method SM 5220 for COD analysis state that blending (homogenization) is needed for samples containing suspended solids prior to conducting the test. Homogenization is an important sample preparation step to reduce variability in the analysis results. Currently the IWL does not follow the homogenization procedure, which might be contributing the variable analysis results.	It is recommended that IWL perform homogenization step prior to analysis for COD analysis.

Table 7.1 Summary of Conclusions and Recommendations

Category	Findings/Conclusions	Recommendations
Statistical Data Evaluation	Statistical analysis is performed on the concentrations, which is highly dependent on wastewater flow. Since loading is directly tied to billing, it should be used basis for the statistical analysis.	Since loading is directly tied to billing, it should be used as the basis for the statistical analysis.
	Although the criterion for acceptance is defined as 95% of the data, less data (as low as 85%) have been accepted for most data sets with the current method. The iterative process of reestablishing the upper and lower limits after rejection of outliers results in ever tighter bounds and large quantities of data are thrown out.	It is suggested not to follow the iterative process and base the statistical evaluation on the whole data set. It is found more reasonable to set the lower and upper boundaries for data rejection to 5% of the top and bottom of the whole data set. This would capture 90% of the data and throw 10% (5% from the top and 5% from the bottom).
Evaluation of a Representative Time Period for Load Calculations	The historical wastewater flow trend varies for each agency, but it is generally in a stable or decreasing pattern after 2006 potentially due to conservation. Decreasing flow and increasing COD and TSS concentration trends are noted for most agencies while no obvious changes have been noted for few of them. The decreasing flow and increasing concentration trends are likely a consequence of water conservation.	It is recommended to use the latest 5-year running average instead of averaging the historical data. Using a 5-year running average will ensure that the data used for billing represents current conditions. The currently practice of quarterly sampling produces 20 data points over a five year period. This is considered adequate. Similar to what is practiced by the City of Los Angeles, the City may consider sampling new dischargers for the first two years and rely on quarterly sampling during subsequent years. Increased sampling frequency could also be temporarily instituted if the wastewater characteristics (flow or strength) have drastically changed at an existing location due to flow diversion or the addition or deletion of a significant tributary discharge.
Review of Practices in Similar Agencies	Billing practices of Orange County Sanitation District and City of Los Angeles, the two agencies of similar size and complexities were reviewed. The objective was to report the billing methods practiced in other, similar agencies. Information gathered could lead to recommending and possibly applying practices that have proven successful at these agencies.	Consider increasing the frequency of sampling to monthly or bi-monthly for the first 1 to 2 years for new dischargers or when existing dischargers make significant operational changes that ultimately impact the quality of their discharge. The frequency could be reduced to quarterly sampling during subsequent years. This could also be performed for agencies, such as Padre Dam MWD and Otay MWD, who discharge treatment waste that are much different from the majority of discharges from other Metro System dischargers. Consider a similar increased sampling frequency when the wastewater characteristic at an existing monitoring location is expected to change because of the addition or deletion of a significant tributary discharge or if flow diversion occurs. Consider reducing the averaging times to 3 to 5 years rather than using the entire historical data.

References

Brown and Caldwell, Wastewater Characterization Study for Padre Dam MWD, November, 2010.

APHA, Standard Methods for Analysis of Wastewater and Water, 21st edition, 2005.

Attachment A: Billing Flow Formulas

Formulas Used to Calculate the Net Agency Flows Based on the Flow Metering Data

METRO SYSTEM SEWAGE TREATMENT FORMULA
CITY OF CHULA VISTA
(with all Inter-agency sewage flows)

+	+	+	+	+	+	+	+	+	-	+
Hollister & Main Meter (CV1)	"J" St Meter (CV2)	"G" ST Meter (CV3)	Autopark & Crossings .025 mgd	Waterpark & Amphitheater .031 mgd	Lagoon Drive 0.011 mgd	Bay Blvd North 106.00 EDU's	Bay Blvd South 16.00 EDU's	Gunpowder Point 51.00 EDU's	Acacia Ave (SV TO CV) 4.00 EDU's	Combined (CV TO SV) 1040.00
+	+	+	+	+	+	+	+	+	=	
E. Flower Street Meter (CV5)	Plaza Bonita-1 Meter (CV6)	Plaza Bonita-2 Meter (CV7)	Las Flores Dr Meter (CV8)	N. Fifth Ave Meter (CV9)	Acacia Ave Meter (CV10)	Otay Lakes Rd Meter (CV11)	Proctor Valley Meter (CV12)	Salt Creek Meter (CV14)	Chula Vista Net	

+ = Chula Vista metered and un-metered flow.
- = Spring Valley un-metered flow.

The formula above reflects the inter-agency flow for the City of Chula Vista for FY 2010 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the Metropolitan Wastewater Department.

Richard Hopkins
Director of Public Works
City of Chula Vista

Date

Dan Brogadir
LUEG Manager
County of San Diego

Date

Roger Bailey
Director, Public Utilities Department
City of San Diego

Date

**METRO SYSTEM CAPACITY FORMULA
CITY OF CORONADO**
(with all Inter-agency sewage flows)

+	-	-	=
Trans-Bay Meter (C1M)	Amph. Base Meter (C2)	North Island 1st & Alameda Meter (C3)	Coronado Net

+ = Coronado metered flow.
- = San Diego metered flow.

The formula above reflects the inter-agency flow for the City of Coronado for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Scott Huth	Date
Director of Public Services City of Coronado	

Roger Bailey	Date
Public Utilities Department City of San Diego	

METRO SYSTEM CAPACITY FORMULA
CITY OF DEL MAR
(with all Inter-agency sewage flows)

+	+	-	+	+	-	=
DM1 Meter	DM2 Meter	Riviera Del Mar 110.00 EDU's	Conn. # 1 96.00 EDU's	Conn. # 2 20.00 EDU's	Del Mar Estates 25.00	Del Mar Net

+ = Del Mar metered and un-metered flow.

- = San Diego un-metered flow.

The formula above reflects the inter-agency flow for the City of Del Mar for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Eric Minicilli	Date
Director of Public Works	
City of Del Mar	

Roger Bailey	Date
Director, Public Utilities Department	
City of San Diego	

**METRO SYSTEM CAPACITY FORMULA
EAST OTAY MESA SEWER MAINTENANCE DISTRICT**

$$\begin{array}{ccc} + & + & = \\ \text{OMEC} & \text{East Otay Mesa} & \text{East Otay Mesa} \\ \text{Meter (TBD)} & 32.20 \text{ EDU's} & \text{Net} \end{array}$$

$+$ = East Otay Mesa metered and un-metered flow.

The formula above reflects the inter-agency flow for the East Otay Mesa Sewer Maintenance District for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Dan Brogadir
LUEG Manager
County of San Diego

Roger Bailey **Date**
Director Public Utilities Department
City of San Diego

METRO SYSTEM CAPACITY FORMULA
CITY OF EL CAJON
(with all Inter-agency sewage flows)

+	+	+	-	-	=
El Cajon Meter (EC1B)	To La Mesa Meter (LM4)	To La Mesa 311.00 EDU's	Wintergardens Reported (WG1M)	Wintergardens 1383.0 EDU's	El Cajon Net

- + = El Cajon metered flow.
- = County metered and un-metered flow.

The formula above reflects the inter-agency flow for the City of El Cajon for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Dennis Davies **Date**
Acting Director of Public Works
City of El Cajon

Dan Brogadir **Date**
LUEG Manager
County of San Diego

Greg Humora **Date**
Director of Public Works / City Engineer
City of La Mesa

Roger Bailey **Date**
Director, Public Utilities Department
City of San Diego

**METRO SYSTEM CAPACITY FORMULA
CITY OF IMPERIAL BEACH**
(with all Inter-agency sewage flows)

+	+	+	+	+	-	-	=
9th & Imp. Meter (IB1)	Elder St. Meter (IB2)	Palm Ave. Meter (IB3M)	N.A.S. Ream Field 0.034 MGD	Georgia Street 170.50 EDU's	Palm Avenue 29.50 EDU's	Eboe Avenue 25.00 EDU's	Imperial Beach Net

+ = Imperial Beach metered and un-metered flow.

- = San Diego metered and un-metered flow.

The formula above reflects the inter-agency flow for the City of Imperial Beach for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Hank Levien	Date
Public Works Director	
City of Imperial Beach	

Roger Bailey	Date
Director, Public Utilities Department	
City of San Diego	

METRO SYSTEM CAPACITY FORMULA
CITY OF LA MESA
(with all Inter-agency sewage flows)

+	+	-	-	-	-	-	-	-	-
La Mesa North LM3 Meter	Colorado	73rd & Sar.	Alvarado Treatment	Alvarado Lab	Alvarado Trng Center	Blue Lake	East Lake	Jackson	Keeny
	16.00 EDU's	22.00 EDU's	61.00 EDU's	27.00 EDU's	2.00 EDU's	69.00 EDU's	349.00 EDU's	279.00 EDU's	28.00 EDU's
-	-	+	+	+	+	+	+	-	-
Lake Arago	Lake Murray	La Mesa South LM1A Meter	LM7 Meter	68th & Univ.	67th & Valencia	Alamo	Vigo	69th & Celia	69th & Univ
292.70 EDU's	119.80 EDU's			91.00 EDU's	178.50 EDU's	4.00 EDU's	204.00 EDU's	73.00 EDU's	34.00 EDU's
-	-	+	+	+	-	-	=		
70th & Colony	73rd & El Cajon	To SV	To LG	To LG LM8 Meter	From EC LM4 Meter	From EC	La Mesa Net		
551.50 EDU's	15.60 EDU's	2712.06 EDU's	920.70 EDU's			311.00 EDU's			

- +** = La Mesa metered and un-metered flow.
- = San Diego metered and un-metered flow and El Cajon metered and un-metered flow.

The formula above reflects the inter-agency flow for the City of La Mesa for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Greg Humora **Date**
Director of Public Works / City Engineer
City of La Mesa

Mike James **Date**
Public Works Director
City of Lemon Grove

Roger Bailey **Date**
Director, Public Utilities Department
City of San Diego

Dan Brogadir **Date**
LUEG Manager
County of San Diego

Dennis Davies **Date**
Acting Director of Public Works
City of El Cajon

METRO SYSTEM CAPACITY FORMULA
LAKESIDE - ALPINE SANITATION DISTRICT
(with all Inter-agency sewage flows)

$$\begin{array}{ccc} + & & = \\ \text{Meter} & & \text{Lakeside - Alpine} \\ \text{(LS2)} & & \text{TOTAL} \end{array}$$

$$+ = \text{Lakeside - Alpine Sanitation District metered flow.}$$

The formula above reflects the inter-agency flow for the Lakeside - Alpine Sanitation District for FY 12 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Dan Brogadir LUEG Manager County of San Diego	Date
--	-------------

Roger Bailey Director, Public Utilities Department City of San Diego	Date
---	-------------

METRO SYSTEM CAPACITY FORMULA
CITY OF LEMON GROVE
(with all Inter-agency sewage flows)

+	+	+	+	+	+	+	+	-	-
Winnett & Oriole St Meter (LG1M)	Akins & 69th Meter (LG2)	Imperial & Viewcrest Meter (LG4)	Total LG to SV 1547.63 EDU's	69th & Madera Meter (LG3)	Calvacado 121.00 EDU's	69th & Klauber 3.00 EDU's	Gold Lake 48.00 EDU's	From LM 920.70 EDU's	From LM Meter (LM8)
-	-	-	-	-	-	-	-	=	
Madera 4.00 EDU's	Angelus Avenue 12.00 EDU's	69th & Evelyn 4.00 EDU's	College Avenue 498.60 EDU's	Navy Housing 278.00 EDU's	College Grove 25.60 EDU's	69th & Gibson 3.00 EDU's	College Grove Way 161.00 EDU's	Lemon Grove Net	

+ = Lemon Grove metered and un-metered flow.
- = San Diego and La Mesa un-metered flow.

The formula above reflects the inter-agency flow for the City of Lemon Grove for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Mike James	Date
Public Works Director	
City of Lemon Grove	

Greg Humora	Date
Director of Public Works / City Engineer	
City of La Mesa	

Dan Brogadir	Date
LUEG Manager	
County of San Diego	

Roger Bailey	Date
Director, Public Utilities Department	
City of San Diego	

+	+
West of I5 NCPS 10.00 EDU's	22nd & Hoover NC Yard & HC 2.00 EDU's

- + = National City metered and un-metered flow.
- = San Diego and Spring Valley metered and un-metered flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Date _____

**METRO SYSTEM CAPACITY FORMULA
PADRE DAM MUNICIPAL WATER DISTRICT**
(with all Inter-agency sewage flows)

+	-	+	+	-	=
Padre Dam Meter (PD1B)	Lakeside Meter (LS2)	Simeon Dr. 413.00 EDU's	Padre Dam Meter (PD2)	Cowles Mtn. 266.00 EDU's	Padre Dam Net

- + = Padre Dam metered and un-metered flow.
- = County metered flow and City of San Diego unmetered flow.

The formula above reflects the inter-agency flow for the Padre Dam Municipal Water District for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Al Lau **Date**
 Director of Engineering and Planning
 Padre Dam Municipal Water District

Dan Brogadir **Date**
 LUEG Manager
 County of San Diego

Roger Bailey **Date**
 Director, Public Utilities Department
 City of San Diego

METRO SYSTEM CAPACITY FORMULA
CITY OF POWAY
(with all Inter-agency sewage flows)

+	+	-	-	-	-	-	-	-	=
Springhurst Meter (PO2)	La Manda 42.00 EDU's	Camino Del Norte Meter (PO1)	Holland Canyon Meter (PO3M)	Eastview Ct. Meter (PO4)	Highland Ranch Meter (PO5)	Creek Road Meter (PO6)	Springhurst Street 72.00 EDU's	Stone Canyon 658.30 EDU's	Poway Net

+ = Poway metered and un-metered flow.

- = San Diego metered and un-metered flow.

The formula above reflects the inter-agency flow for the City of Poway for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Leah Browder	Date
Director of Public Works	
City of Poway	

Roger Bailey	Date
Director, Public Utilities Department	
City of San Diego	

METRO SYSTEM CAPACITY FORMULA
CITY OF SAN DIEGO
(with all Inter-agency sewage flows)

+	+	+	+	+	+	+	+	+	+	+	+	+
SD33 Meter	N. Harbor Drive 2550.40	SD1E Meter	SD2A Meter	SD2B Meter	Sports Arena Blvd. 498.00	SD3 Meter	Barnett Avenue 2551.60	SD5 Meter	SD20 Meter	SD40 Meter	SD42 Meter	Juan Street
+	+	+	+	+	+	+	+	+	+	+	+	+
SD1F Meter	SD7B Meter	SD8 Meter	Commercial Street 1458.60	SD12 Meter	SD6 Meter	SD1B Meter	SD19 Meter	Anna Street 564.00	SD7A Meter	SD7C Meter	Beech Street 1944.20	SD9 Meter
+	+	+	+	+	+	+	+	+	+	+	+	+
SD9D Meter	NC9M Meter	NC10 Meter	NC11 Meter	NC12 Meter	NC6 Meter	San Diego HC Through NC Total	BO1 Meter	San Diego HC Through SPV Total	SD10 Meter	PC1 Meter	Eboe Street 25.0	Palm Avenue 29.5
+	+	+	+	+	+	-	-	-	-	-	-	-
SD11 Meter	South Bay Water Rec. Plt. Influent	Elm Street 1455.00	USN4 Meter	USN5 Meter	USN8 Meter	Del Mar Net	Poway Net	EC1B Meter	Padre Dam Net	Lakeside Net	LM North to San Diego Net	Coronado Net
-	-	-	-	-	-	-	-	-	-	-	-	-
LG to San Diego Net	LM South to San Diego Net	NC7M Meter	Olive Ave. 6.00	Rachael Ave. North 46.00	NC15 Meter	Bonita Paradise 47.00	Rachael Ave. South 43.00	Waterpark & Amphitheater	Alta Drive 84.40	IB2 Meter	Georgia Street 170.5	IB3M Meter
-												
ORPS Wet Well												

- + = City of San Diego metered and un-metered flow.
- = Chula Vista, Coronado, Del Mar, El Cajon, Imperial Beach, Lakeside/Alpine, La Mesa, Lemon Grove, National City, Padre Dam and Poway metered and un-metered flow.

The formula above reflects the inter-agency flow for the City of San Diego for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the Public Utilities Department.

Roger Bailey _____ **Date**
Director, Public Utilities Department
City of San Diego

Richard Hopkins _____ **Date**
Director of Public Works
City of Chula Vista

Scott Huth _____ **Date**
Director of Public Services
City of Coronado

Eric Minicilli _____ **Date**
Director of Public Works
City of Del Mar

Dennis Davies _____ **Date**
Acting Director of Public Works
City of El Cajon

Hank Levien _____ **Date**
Public Works Director
City of Imperial Beach

Greg Humora _____ **Date**
Director of Public Works / City Engineer
City of La Mesa

Mike James _____ **Date**
Public Works Director/City Engineer
City of Lemon Grove

Joe Smith _____ **Date**
Public Works Director
City of National City

Dan Brogadir _____ **Date**
LUEG Manager
County of San Diego

Al Lau _____ **Date**
Director of Engineering and Planning
Padre Dam Municipal Water District

Leah Browder _____ **Date**
Director of Public Works
City of Poway

METRO SYSTEM CAPACITY FORMULA
SPRING VALLEY SANITATION DISTRICT
 (with all Inter-agency sewage flows)

+	+	+	+	+	-	-	-	-	-
Brisbane & 5th SV8M Meter	Lincoln Acres Alta Drive 84.40 EDU's	Sweetwater NC13 Meter (68.53%)	Prospect St NC16 Meter 36.74%	SV to NC Inter-Agency Compromise 29.60 EDU's	NC to SV Inter-Agency Compromise 16.80 EDU's	(From NC) NC8M Meter	SubTotal Chula Vista to SV (1)	SubTotal La Mesa To SV 2712.06 EDU's	SubTotal Lemon Grove To SV 1547.63 EDU's
-	-	-	-	-	-	-	-	-	-
Bonita BO1 Meter	Manzana Way 439.00 EDU's	Parbrook Street 197.00 EDU's	Noeline Avenue 109.00 EDU's	Worthington Street 64.00 EDU's	Innsdale Avenue 51.00 EDU's	Greenridge Avenue 10.00 EDU's	Ellenwood Circle North 9.00 EDU's	Delrose Avenue 109.00 EDU's	Crestmore Avenue 8.00 EDU's
-	-	-	=						
Potrero Street 61.00 EDU's	Carlsbad Street 41.00 EDU's	Otay Net	Spring Valley Net						

+ = Spring Valley metered and un-metered flow.

- = San Diego, National City, Chula Vista, Otay, La Mesa and Lemon Grove metered and un-metered flow.

(1) Includes the sum of meters CV5 through CV12; 1040.00 EDU's from Chula Vista less 4 EDU's from Spring Valley to Chula Vista.

The formula above reflects the inter-agency flow for the Spring Valley Sanitation District for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Dan Brogadir	Date
LUEG Manager	
County of San Diego	

Mike James	Date
Public Works Director/City Engineer	
City of Lemon Grove	

Richard Hopkins	Date
Director of Public Works	
City of Chula Vista	

Greg Humora	Date
Director of Public Works / City Engineer	
City of La Mesa	

Mark Watton	Date
District General Manager	
Otay Water District	

Joe Smith	Date
Public Works Director	
City of National City	

Roger Bailey	Date
Director, Public Utilities Department	
City of San Diego	

METRO SYSTEM CAPACITY FORMULA
WINTERGARDENS SEWER MAINTENANCE DISTRICT
(with all Inter-agency sewage flows)

+	+	=
Wintergardens Meter (WG1M)	Housecount 1,383.00 EDU's	Wintergardens TOTAL

The formula above reflects the inter-agency flow for the Wintergardens Sewer Maintenance District for FY 2012 billing. Un-metered flow (housecounts) may change over time; it is the responsibility of the impacted Agencies to determine, confirm, modify and come to agreement on housecounts for inter-agency flow.

This formula must be reviewed annually for modifications and it is the responsibility of the Agencies with inter-agency flows to report those changes to the City of San Diego Public Utilities Department.

Dan Brogadir
LUEG Manager
County of San Diego

Date

Roger Bailey
Director, Public Utilities Department
City of San Diego

Date

AGENDA ITEM 9

Attachment

MetroTAC
2012/13 Work Plan
February 2013 (Revised Per Metro TAC)

MetroTAC Items	Description	Subcommittee Member(s)
IRWMP	4:12: Metro TAC received a presentation from Cathy Pieroni (City of San Diego) on the Integrated Regional Water Management Program (IRWMP). Group is still relatively informal but plans to become more structured during its upcoming 2 year plan update. There is a governance & finance work group that starts in the 3rd quarter of 2012 and at that point the JPA role will be examined. Padre Dam and Chula Vista are regular participants. 9/19: Cathy Pieroni gave an update. Recommendation by IRWM to the RAC to include a seat for the Metro JPA. Bob Kennedy will attend the October 3, 2012 meeting representing the JPA. 11/12: At their November 2012 meeting the Metro Commission unanimously appointed Bob Kennedy of Otay Water District as primary and Metro TAC Chairman Greg Humora as alternate to the IRWMP RAC. <i>2/13: On February 6, 2013 Bob Kennedy attended the IRWMP meeting. Metro JPA has been added as a permanent member of the Water Quality subcommittee of the RAC. The City of San Diego presented an overview of the Recycled Water Study. Next meeting scheduled for April 3, 2013</i>	Bob Kennedy Greg Humora
Fiscal Items	The Finance committee will continue to monitor and report on the financial issues affecting the Metro System and the charges to the PAs. The debt finance and reserve coverage issues have been resolved. Refunds totaling \$12.3 million were sent to most of the PA's. 10/26/11: 2010 will be the first year where the PAs will be credited with interest on the debt service reserve and operational fund balances. Interest will be applied as an income credit to Exhibit E when that audit is complete.	Greg Humora Karen Jassoy Karyn Keese
Recycled Water Revenue Issue	Per our Regional wastewater Agreement revenues from SBWTP are to be shared with PA's. 4/11: City has agreed to pay out revenue to Wastewater Section and PA's credit will be on the Exhibit E adjustments at year end Open issues: Capacity reservation lease payments and North City Optimized System Debt service status. 12/11: Letter sent to San Diego regarding outstanding recycled water revenue issues. <i>2/13: Karyn Keese continues to meet with City staff to determine the basis of the water departments administrative charges.</i>	Scott Huth Scott Tulloch Karyn Keese
Water Reduction - Impacts on Sewer Rates	The MetroTAC wants to evaluate the possible impact to sewer rates and options as water use goes down and consequently the sewer flows go down, reducing sewer revenues. Sewer strengths are also increasing because of less water to dilute the waste. We are currently monitoring the effects of this. 2/2011: wastewater revenues are declining due to conservation and flow reductions and agencies are re-prioritizing projects to be able to cover annual operations costs	Eric Minicilli Bob Kennedy Karyn Keese
"No Drugs Down the Drain"	The state has initiated a program to reduce pharmaceuticals entering the wastewater flows. There have been a number of collection events within the region. The MetroTAC, working in association with the Southern California Alliance of Publicly-owned Treatment Works (SCAP), will continue to monitor proposed legislation and develop educational tools to be used to further reduce the amount of drugs disposed of into the sanitary sewer system. 8/2010: County Sheriff and Chula Vista have set up locations for people to drop off unwanted medications and drugs. 4/11: <i>Local law enforcement has taken a proactive role and is sponsoring drug take back events.</i> 3/11: <i>TAC to prepare a position for the board to adopt; look for a regional solution; watch requirements to test/control drugs in wastewater.</i> 10/26/11: A prescription drug take back day is scheduled for 10/29/11. Go to www.dea.gov to find your nearest location. 4/12: East County to host a prescription drug take back 4/28/12.	Greg Humora

MetroTAC Items	Description	Subcommittee Member(s)
Flushable Items that do not Degrade	Several PAs have problems with flushable products, such as personal wipes, that do not degrade and cause blockages. MetroTAC is investigating solutions by other agencies, and a public affairs campaign to raise awareness of the problems caused by flushable products. We are also working with SCAP in their efforts to help formulate state legislation to require manufacturers of products to meet certain criteria prior to labeling them as "flushable." Follow AB2256 and offer support.	Eric Minicilli
Grease Recycling	To reduce fats, oils, and grease (FOG) in the sewer systems, more and more restaurants are being required to collect and dispose of cooking grease. Companies exist that will collect the grease and turn it into energy. MetroTAC is exploring if a regional facility offers cost savings for the PAs. The PAs are also sharing information amongst each other for use in our individual programs. <i>3/11: get update on local progress and status of grease rendering plant near Coronado bridge</i>	Eric Minicilli
Padre Dam Mass Balance Correction	11/11: Padre Dam has been overcharged for their sewage strengths since 1998. Staff from City of San Diego presented a draft spreadsheet entitled Master Summary Reconciliations Padre Dam Mass Balance Corrections Calculation. Rita Bell and Karyn Keese were elected to review the documentation and report back to Metro TAC. 2/12: Audit complete. Item added as Standing to Metro TAC agenda. 4/12: This issue is scheduled as a standing item and discussed at each Metro TAC meeting until it is resolved. Currently Metro TAC is focusing on the statute of limitations. <i>2/13: The PAs have received a joint letter from Padre Dam/City of San Diego. The PA's attorneys group continues to meet on this issue.</i>	Rita Bell Karyn Keese
Waiver and Recycled Water Study Implementation	11/12: Metro TAC requested a timeline from City staff including milestones for the waiver process. The waiver is due no later than 7/30/15. However, the application needs to be submitted six months prior to the July date (2/1/15). Preparation of the waiver will begin in the early part of FYE 2014. <i>2/13: City staff has met to start coordination of the waiver process. Staff in attendance included Roger Bailey, Marsi Steirer, Guann Hwang, Steve Meyers, and Allan Langworthy.</i>	Al Lau Scott Tulloch Karyn Keese
Recycled Water Rate Study	San Diego is working on a rate study for pricing recycled water from the South Bay plant and the North City plant. Metro TAC, in addition to individual PAs, has been engaged in this process and has provided comments on drafts San Diego has produced. We are currently waiting for San Diego to promulgate a new draft which addresses the changes we have requested. 10/26/11: draft study still not issued	Karyn Keese Rita Bell
City of San Diego Revised Procurement Process	8/12: San Diego City Engineer James Nagelvoort reported on recent changes to San Diego's procurement process to move projects through more quickly. Technically any CIP projects under \$30 million may no longer need to be reviewed by the Metro TAC or JPA prior to City Council approval. Chairman Humora requested San Diego prepare a summary of the recent changes and the decision points for consideration of the TAC at the September meeting. 10/4: Metro Commission requests further review by TAC to recommend an appropriate level for CIP's to be brought forth to the Commission. 11/12: MetroTAC recommended leaving the thresholds as they are today and therefore everything will go through TAC and then to the JPA for formal action. The policy will be placed on the JPA website. The Metro Commission approved the policy at their November 2012 meeting. San Diego's CIP will become a standing item on the Metro TAC agenda.	Metro TAC

MetroTAC Items	Description	Subcommittee Member(s)
Salt Creek Diversion	9/2010: OWD, Chula Vista and San Diego met to discuss options and who will pay for project; Chula Vista and OWD are reviewing options. 2/2011: OWD and PBS&J reviewed calculations with PUD staff; San Diego to provide backup data for TAC to review. This option is also covered in the Recycle Water Study. 10/26/11: Back-up information has still not been received from staff. 8/12: San Diego to conduct business case evaluation and add to Capital Improvement Program as recommend by Metro Commission to San Diego City Council on July 17, 2012 in support of the Recycled Water Study.	Roberto Yano Bob Kennedy Karyn Keese Rita Bell
Recycled Water Study Cost Allocation	A small working group was formed to discuss options to allocate PLWTP offset project costs among the water and wastewater rate payers; Concepts will be discussed at TAC and JPA Board in near future. 7/12: Subcommittee to meet with PUD staff & consultants to review TM 8 and economic model. 8/12: Subcommittee has meet with City staff and consultants. Economic model has been received. City will not pursue cost allocations until Demonstration Project is complete due to staffing constraints.	Roberto Yano Al Lau Karyn Keese Rita Bell
Board Members' Items		
Rate Case Items	1/12: San Diego is in the process of hiring a consultant to update their rate case. As part of that process, Metro TAC and the Finance Committee will be monitoring the City's proposals as they move forward. 6/12: San Diego hired Black & Veatch as their rate consultant. <i>2/13: Preliminary results were reported at the IROC Meeting of 2/19/13. Karyn Keese will be working with the IROC Finance Committee to review details.</i>	Karyn Keese
Exhibit E	Metro TAC and the Finance Committee are active and will monitor this process. Individual items related to Schedule E will come directly to the Board as they develop. <i>2/13: 2010 and 2011 audits are ongoing.</i>	Karen Jassoy Karyn Keese
Future bonding	Metro TAC and the Finance Committee are active and will monitor this process. Individual items related to bonding efforts will come directly to the Board as they develop. 10/26/11: San Diego is issuing an RFP for a cost of service study to support a future bond issue potentially in mid-2013. Kristin Crane to sit on the selection panel. <i>2/13: San Diego's preliminary rate case does not show the issuance of additional debt until FY 2018.</i>	Karen Jassoy Karyn Keese Kristen Crane
Changes in water legislation	Metro TAC and the Board should monitor and report on proposed and new legislation or changes in existing legislation that impact wastewater conveyance, treatment, and disposal, including recycled water issues	Paula de Sousa
Role of Metro JPA regarding Recycled Water	As plans for water reuse unfold and projects are identified, Metro JPA's role must be defined with respect to water reuse and impacts to the various regional sewer treatment and conveyance facilities 2/12: <i>Scott Huth removed as member due to new position. JPA/Metro TAC needs to appoint a new representative.</i>	Karyn Keese
Border Region	Impacts of sewer treatment and disposal along the international border should be monitored and reported to the Board. These issues would directly affect the South Bay plants on both sides of the border. <i>2/12: This Item does not have a champion. Should we remove?</i>	
SDG&E Rate Case	8/19: Karyn to check with Paula regarding latest SDG&E issues. 11/12: Sophie Akins from BBK will present updated information to Metro TAC.	Paula de Sousa
Metro JPA Strategic Plan	6/12: Chairman Ewin to establish a subcommittee to monitor the progress of strategic plan initiatives.	<i>Who should take over?</i>

Completed Items	Description	Subcommittee Member(s)
Debt Reserve and Operating Reserve Discussion	In March 2010, the JPA approved recommendations developed by Metro JPA Finance Committee, MetroTAC, and the City of San Diego regarding how the PA's will fund the operating reserve and debt financing. MetroTAC has prepared a policy document to memorialize this agreement. Project complete: 4/10	Scott Huth Karyn Keese Doug Wilson
State WDRs & WDR Communications Plan	The Waste Discharge Requirements (WDRs), a statewide requirement that became effective on May 2, 2006, requires all owners of a sewer collection system to prepare a Sewer System Management Plan (SSMP). Agencies' plans have been created. We will continue to work to meet state requirements, taking the opportunity to work together to create efficiencies in producing public outreach literature and implementing public programs. Project complete: 5/10. 2/12: State has proposed new WDR regulations. Metro TAC will not reopen but Dennis Davies will stay on top of the issue.	Dennis Davies
Ocean Maps from Scripps	Schedule a presentation on the Sea Level Rise research by either Dr. Emily Young, San Diego Foundation, or Karen Goodrich, Tijuana River National Estuarine Research Reserve Project complete: 5/10	Board Member Item
Secondary Waiver	The City of San Diego received approval from the Coastal Commission and now the Waiver is being processed by the EPA. The new 5 year waiver to operate the Point Loma Wastewater Treatment Plant at advanced primary went into effect August 1, 2010. Project complete 7/10	Scott Huth
Lateral Issues	Sewer laterals are owned by the property owners they serve, yet laterals often allow infiltration and roots to the main lines causing maintenance issues. As this is a common problem among PAs, the MetroTAC will gather statistics from national studies and develop solutions. 4/11: There has been no change to the issue. We will continue to track this item through SCAP and report back when the issue is active again. Efforts closed 3/11	Tom Howard Joe Smith
Advanced Water Purification Demonstration Project	San Diego engaged CDM to design/build/operate the project for the water repurification pilot program. 2/8/11: Equipment arrived 3/2011; tours will be held when operational (June/July 2011 timeframe). 2/12: Tours are available. San Diego whitepaper on IPR distributed to Metro TAC members. Closed 4/18/12	Al Lau
SDG&E Rate Case	SDG&E has filed Phase 2 of its General Rate Case, which proposes a new "Network Use Charge" which would charge net-energy metered customers for feeding renewable energy into the grid as well as using energy from the grid. The proposal will have a significant impact on entities with existing solar facilities, in some cases, increases their electricity costs by over 400%. Ultimately, the Network Use Charge will mean that renewable energy projects will no longer be as cost effective. SDG&E's proposal will damage the growth of renewable energy in San Diego County. A coalition of public agencies has formed to protest this rate proposal. 2/12: PUC has not accepted SDG&E's filing. Metro TAC move to close this item. Will continue to monitor this. 8/19: Karyn to check with Paula regarding latest SDG&E issues.	Paula de Sousa
Metro JPA Strategic Plan	2/2011: committee to meet 2/28/11 to plan for retreat to be held on 5/5/11 JPA strategic planning committee to meet to update JPA Strategic Plan and prepare action items. 1/12: Draft strategic plan reviewed by Board and referred to Metro TAC for input. MetroTAC has created a subcommittee to work on this project. 2/12: Metro TAC has completed their final review. Forwarded to Commission. 4/12: Adopted at April 2012 Metro JPA Meeting. Project complete.	Augie Caires

Completed Items	Description	Subcommittee Member(s)
Recycled Water Study	As part of the secondary waiver process, San Diego agreed to perform a recycled water study within the Metro service area. That study is currently underway, and MetroTAC has representatives participating in the working groups. TM #8 Costs estimates are out and PAs provided comments on TM#8 and have asked for a technical briefing. 10/16/11: Final draft of report is due out in November 2011. 1/12: Final draft of report is due in March 2012. 3/12: Final draft available for comments until 3/19/12 4/12: PUD staff to give presentation to Metro JPA at their May meeting. 5/12 PUD staff presented the Recycled Water Study to the Metro JPA at their May meeting. Metro JPA approved the Study as a planning document. Study to move forward to SD City Council in July 2012 with letter of support from JPA. 7/12: City of San Diego approved the Recycled Water Study; Study submitted on time to Coastal Commission. Final report uploaded to JPA website. 11/12: San Diego received a letter from the Coastal Commission. Metro Commission consensus was that based on the tone of the Coastal Commission letter the region may be seeing some time line changes relative to San Diego's projections on the implementation of IPR and that the MetroTAC needs to manage all aspects including the Coastal Commission and multiple issues such as desalination water, Coastal Commissions attitude at this point and pending IPR programs we have heard about.	Scott Huth Al Lau Scott Tulloch Karyn Keese

Metro TAC

Participating Agencies

Selection Panel Rotation

Agency	Representative	Selection Panel	Date Assigned
Padre Dam	Neal Brown	IRWMP – Props 50 & 84 Funds	2006
El Cajon	Dennis Davies	Old Rose Canyon Trunk Sewer Relocation	9/12/2007
La Mesa	Greg Humora	As-Needed Piping and Mechanical	11/2007
National City	Joe Smith	MBC Additional Storage Silos	02/2008
Otay Water District	Rod Posada	As-Needed Biological Services 2009-2011	02/2008
Poway	Tom Howard	Feasibility Study for Bond Offerings	02/2008
County of San Diego	Dan Brogadir	Strategic Business Plan Updates	02/2008
Coronado	Scott Huth	Strategic Business Plan Updates	09/2008
Coronado	Scott Huth	As-needed Financial, HR, Training	09/2008
PBS&J	Karyn Keese	As-needed Financial, Alternate HR, Training	09/2008
Otay Water District	Rod Posada	Interviews for Bulkhead Project at the PLWTP	01/2009
Del Mar	David Scherer	Biosolids Project	2009
Padre Dam	Neal Brown	Regional Advisory Committee	09/2009
County of San Diego	Dan Brogadir	Large Dia. Pipeline Inspection/Assessment	10/2009
Chula Vista	Roberto Yano	Sewer Flow Monitoring Renewal Contract	12/2009
La Mesa	Greg Humora	Sewer Flow Monitoring Renewal Contract	12/2009
Poway	Tom Howard	Fire Alarm Panels Contract	12/2009
El Cajon	Dennis Davies	MBC Water System Improvements D/B	01/2010
Lemon Grove	Patrick Lund	RFP for Inventory Training	07/2010
National City	Joe Smith	Design/Build water replacement project	11/2010
Coronado	Scott Huth	Wastewater Plan update	01/2010
Otay Water District	Bob Kennedy	RFP Design of MBC Odor Control Upgrade/Wastewater Plan Update	02/2011
Del Mar	Eric Minicilli	Declined PS 2 Project	05/2011
Padre Dam	Al Lau	PS 2 Project	05/2011
County of San Diego	Dan Brogadir	RFP for As-Needed Biological Services Co.	05/2011
Chula Vista	Roberto Yano	North City Cogeneration Facility Expansion	07/2011
La Mesa	Greg Humora	confined space RFP selection panel	10/2011
Poway	Tom Howard	COSS's for both Water and WW	10/2011
El Cajon	Dennis Davies	Independent Accountant Financial Review & Analysis – All Funds	01/2012

Updated 11/2012

EXP

Lemon Grove	Mike James	MBC Dewatering Centrifuges Replacement (Passed)	01/2012
National City	Joe Smith	MBC Dewatering Centrifuges Replacement (Passed)	01/2012
Coronado	Godby, Kim	MBC Dewatering Centrifuges Replacement (Passed)	01/2012
Otay Water District	Bob Kennedy	MBC Dewatering Centrifuges Replacement (Accepted)/Strategic Planning Rep	01/2012
Del Mar	Eric Minicilli	New As Need Engineering Contract	02/2012
Padre Dam	Al Lau	PA Rep. for RFQ for As Needed Design Build Services (Passed)	05/2012
County of San Diego	Dan Brogadir	PA Rep. for RFQ for As Needed Design Build Services (Cancelled project)	05/2012
Chula Vista	Roberto Yano	As-Needed Condition Assessment Contract (Accepted)	06/2012
La Mesa	Greg Humora	New programmatic wastewater facilities condition (Awaiting Response)	11/2012
Poway	Tom Howard	Optimization Review Study	01/2013
El Cajon	Dennis Davies		
Lemon Grove	Mike James		
National City	Joe Smith		
Coronado	Godby, Kim		
Otay Water District	Bob Kennedy	Strategic Planning (Volunteered, participated last year)	01/2013
Del Mar	Eric Minicilli		
Padre Dam	Al Lau		
El Cajon	Dennis Davies		
Lemon Grove	Patrick Lund		
National City	Joe Smith		
Coronado	Scott Huth		
Otay Water District	Bob Kennedy		
Del Mar	Eric Minicilli		
Padre Dam	Al Lau		
County of San Diego	Dan Brogadir		
Chula Vista	Roberto Yano		
La Mesa	Greg Humora		

Sewer Rate Comparison in San Diego County **7 Unit Water Use and 3/4" Residential Meter** **Projected sewer bill effective January 2013**

Red bars indicate flow based user rates
 Blue bars indicate flat or EDU based user rates

