City of San Diego
Public Utilities Department

Metropolitan Wastewater Plan

August 2012

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METROPOLITAN WASTEWATER PLAN
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AA – Annual Allocations

AADF – Annual Average Daily Flow

BAF – Biological Aerated Filtration

BOD – Biochemical oxygen demand

CCC – California Coastal Commission

CCI – Construction Cost Index

CEPT – Chemically Enhanced Primary Treatment

CIP – Capital Improvement Projects

City – City of San Diego

DWF – Dry Weather Flow

EMPP- East Mission Bay Pipeline

EPA – Environmental Protection Agency

I/I – Inflows and Infiltrations

IROC – Independence Rates Oversight Committee

ESD –Emergency Stream Discharge

MBBR – Moving Bed Bioreactor

MBC – Metropolitan Biosolids Center

MER – Mass Emission Rate

MG – Million Gallons

mgd – million gallons per day

mt/yr – metric tons per years

MVWTP – Mission Valley Wastewater Treatment Plant

MWP – Metropolitan Wastewater Plan

NCEP- North City Effluent Pipeline

NCWRP – North City Water Reclamation Plant

NPDES – National Pollution Discharge Elimination System

O&M – Operations and Maintenance

OPRA – Ocean Protection Reduction Act

PLOO – Point Loma Ocean Outfall

PLWTP – Point Loma Wastewater Treatment Plant

PS – Pump Station

PUD – Public Utilities Department

PWWF – Peak Wet Weather Flow

SANDAG – San Diego Association of Governments

SBOO – South Bay Ocean Outfall

SBWRP – South Bay Water Reclamation Plant

SBWTP – South Bay Wastewater Treatment Plant

TBD – To Be Determined

TDD – Tentative Decision Documentation

TSS – Total Suspended Solids

UGR – Unit Generation Rate

USET – Public Utilities' Senior Management Team

VC – Vitrified Clay

WFMP – Water Facilities Master Plan

WWSF – Wet Weather Storage Facility

EXECUTIVE SUMMARY

The purpose of the 2012 Metropolitan Wastewater Plan (MWP) is to provide long-term planning for Metro facility needs and guidance for the Capital Improvement Program (CIP). The MWP is mainly tied to system storage capacity needs during wet weather events and a maximum mass emission rate (MER) of 13,598 metric tons per year (mt/yr) of total suspended solids (TSS) at the Point Loma Wastewater Treatment Plant (PLWTP). This is the maximum TSS permitted by the 301(h) modified National Pollution Discharge Elimination System (NPDES) Permit,also known as the "Waiver". The permit requirements are established by the California Regional Water Quality Control Board (RWQCB) and U.S. Environmental Protection Agency (USEPA). In addition to wet weather storage capacity and MER requirements, the plan also includes projects at Metro facilities that were identified by a condition assessment program conducted by the Public Utilities Department (PUD). The MWP is periodically updated every five years, or one year after the approval of the PLWTP NPDES permit, or as-needed to incorporate factors such as the latest information on population growth and wastewater flows, load trends within the Metro Service Area, regulations imposed by federal and state agencies, the markets for reclaimed water, and various local issues important to the City and the participating agencies served by Metro.

In June 2010, USEPA issued a new five-year 301(h) modified NPDES permit to the City of San Diego. The permit took effect August 1, 2010 and will expire on July 31, 2015. The new modified NPDES permit specified a set of discharge requirements to ensure compliance with the terms of the Clean Water Act and Ocean Plan. The Modified NPDES permit issued to the City is a modification to Section 301(h) of Clean Water Act, in which the PLWTP, as an advanced or chemically-enhanced primary treatment (CEPT) facility, is permitted to discharge treated wastewater with less than secondary treatment at the PLWTP to the Pacific Ocean through a 4.5 mile ocean outfall.

Approach and Methodology

The approach and methodology used in the 2012 MWP for developing a long-term plan for Metro facility needs is based on the assumption that the PLWTP continues to function as a CEPT facility with a capacity of 240 million gallons per day (mgd) for the entire duration of the 2050 planning horizon. In addition, the plan is also based on key information and assumptions described below:

Key Information

- **The 2010 USEPA and RWQCB 301(h) modified NPDES Permit**: the permit specified effluent discharge or mass emission rate (MER) maximum limit of 13,598 metric tons per year (mt/yr) of total suspended solids (TSS).
- SANDAG Series 12: 2050 population growth projection data
- 2003 MWP
- Hydrological and MER Models

Assumptions

- The planning horizon is 2050.
- **A 10-year return AADF**: The Metro Technical Advisory Committee (TAC) accepted for facility planning.
- **TSS concentration of 297 mg/l**: This is the highest annual average concentration observed system wide in the last 5 years and it is used for planning purposes.
- ***Recycled Water Study (RWS)***: The City is currently conducting a RWS, which is scheduled to be completed by 2012. The purpose of the RWS is to identify opportunities within the City's system to maximize recycling and reclamation of wastewater for non-potable and indirect potable reuse. Upon completion of the RWS and determination of the final decision on approved alternatives and implementation plan, alternative(s) will be evaluated in terms of impact on the Metro sewage system. The MWP will be updated based on the final approved alternative(s) in future MWP update.

Wastewater Flow and Load Projections

Wastewater Flow Projections

Base Flow: Annual Average Daily Flow (AADF)

Wastewater projections of AADF generated within the Metro service area are updated on a regular basis to reflect the latest available information and trends in population growth, per capita wastewater flows, and population-independent flows (e.g. inflows/infiltrations (I/I), military, special industries, truck-hauled sewages, etc.). In November 2003, the MWP was updated by the PUD (formerly known as the Metropolitan Wastewater Department). The 2012 MWP is built upon the 2003 MWP. Since the 2003 MWP update, two factors have led to decreasing flow projections. The changes attributed to these two factors are reflected in the 2012 MWP. These factors are described below:

- **SANDAG 2050, Series 12**: In 2010, SANDAG published new residential and employment population projections. In comparison to the 2003 MWP, which was based on the SANDAG 2020, Series 9, the projected residential and employment population have dropped by an average of 8% and 1%, respectively.

- **Declining Unit Generation Rate (UGR):** The UGR is defined as gallons per day of wastewater generated per person (capita). Per capita wastewater flows have been declining since the early 1990s, which primarily reflects the success of water conservation programs implemented in response to drought conditions and the increase in the cost of potable water. In comparison to the 2003 MWP, the projected UGR for residential and employment populations have dropped by an average of 4% and 6%, respectively.

The comparison of 2003 MWP to 2012 MWP UGR and SANDAG population projections is summarized in Table ES-1 below.

Table ES-1
2012 METROPOLITAN WASTEWATER PLAN
UGR and SANDAG Comparison

		2003 MWP	2012 MWP	% Difference from 2003
UGR	Residential	75	72.1	-4%
	Employment	23.6	22.3	-6%
SANDAG Regional Growth Forecast	Residential	Series 9	Series 12	-8%
	Employment			-1%

The decrease of the projected population and UGR has resulted in a decrease of projected flow by approximately 11% from the 2003 MWP to the 2012 MWP.

10-year Return AADF

Variations in rainfall from year to year can result in significant variations of Inflow and Infiltration (I/I). Based on the 62-year rainfall data, a continuous hydrological model simulation of the wet weather peak flows in the past decade shows that variations in annual rainfall could add up to 9 to 12 percent of dry weather flow as the I/I component in the AADF. This master plan utilizes a 10-year return AADF (equivalent to 9.6 percent of the dry weather flow) which includes the I/I variations.

Projected 10-year Return Peak Wet Weather Flow

In the 2003 MWP, for planning purposes, the I/I component was generally assumed to increase at a rate proportional to the increase of population growth. After the 2003 MWP, the I/I

component was reevaluated using the hydrological model based on historical flow monitoring data from the wet years of 1998 to 2005 in order to quantify the average annual increase in I/I. The hydrological model indicated that I/I appears to have increased from 1998 to 2005 by about 1.5 percent per year. Therefore, for the 2012 MWP, a rate of increase in I/I of 1.5 percent per year was assumed for projected peak flows.

Waste Load Projections

Projections of average annual waste loads generated within the Metro service area are needed to determine treatment requirements in order to ensure that the MER remains below the maximum TSS limit of 13,598 mt/yr. In the last 10 years, the system-wide total loads have fluctuated and the unit generation rates for loads (pounds per day per capita) have declined since the early 1990s. However, due to the fluctuations in waste strengths, the system-wide highest annual average TSS strength observed in the last five years is 297 mg/l and was used to calculate the load projections to ensure the conservativeness in planned facilities.

Conclusion

MER Projections

Treatment Facilities Requirements

Based on the MER projection analysis, the mass emission rate of TSS will exceed 13,598 mt/y by year 2030. A 21 mgd South Bay Wastewater Treatment Plant (SBWTP) with a solid handling facility will be needed to reduce MER. The SBWTP will provide MER relief until 2044 when an additional 15 mgd Mission Valley Wastewater Treatment Plant (MVWTP) will be required to further reduce the MER. The MVWTP will provide MER relief beyond the 2050 planning horizon of this report. The SBWTP and MVWTP facilities will be built as secondary treatment plants with the option to upgrade to water reclamation plants.

Wet Weather Storage Facility (WWSF) Staging

Numerous control measures were investigated for optimal utilization of existing facilities to either temporarily store or divert excess flows in order to minimize the impact of peak flow. Among those deemed viable, the use of the equalization tanks at NCWRP, Miramar Reclaimed Water Tank, MBC digesters, and the in-system storage in the Metro Interceptors were included as control measures for the emergency storage, while SBWRP was included for flow diversion during extreme wet weather events. The total effective (in-system) storage volume available by using these storage facilities was determined to be 12 million gallons. Based on hydrological modeling analysis using 1998 wet weather flow data, additional storage volume is needed and was not contemplated in the previous MWP.

As a remedy to the storage limitation during peak wet weather flow, a series of WWSFs are proposed for construction over the span of about 40 years. The implementation of the WWSFs will be dictated by the regulatory approval of the City proposed 16 mgd emergency stream discharge (ESD) facility. The discharge would only occur during the extreme peak wet weather flow events as emergency discharge to relieve the Metro sewer system capacity. The implementation of the ESD would delay the construction of the wet weather storage facilities. The City is currently working with the stakeholders and the Regional Water Quality Control Board (RWQCB) to obtain an emergency stream discharge permit from the regulatory agency. The two options are presented below:

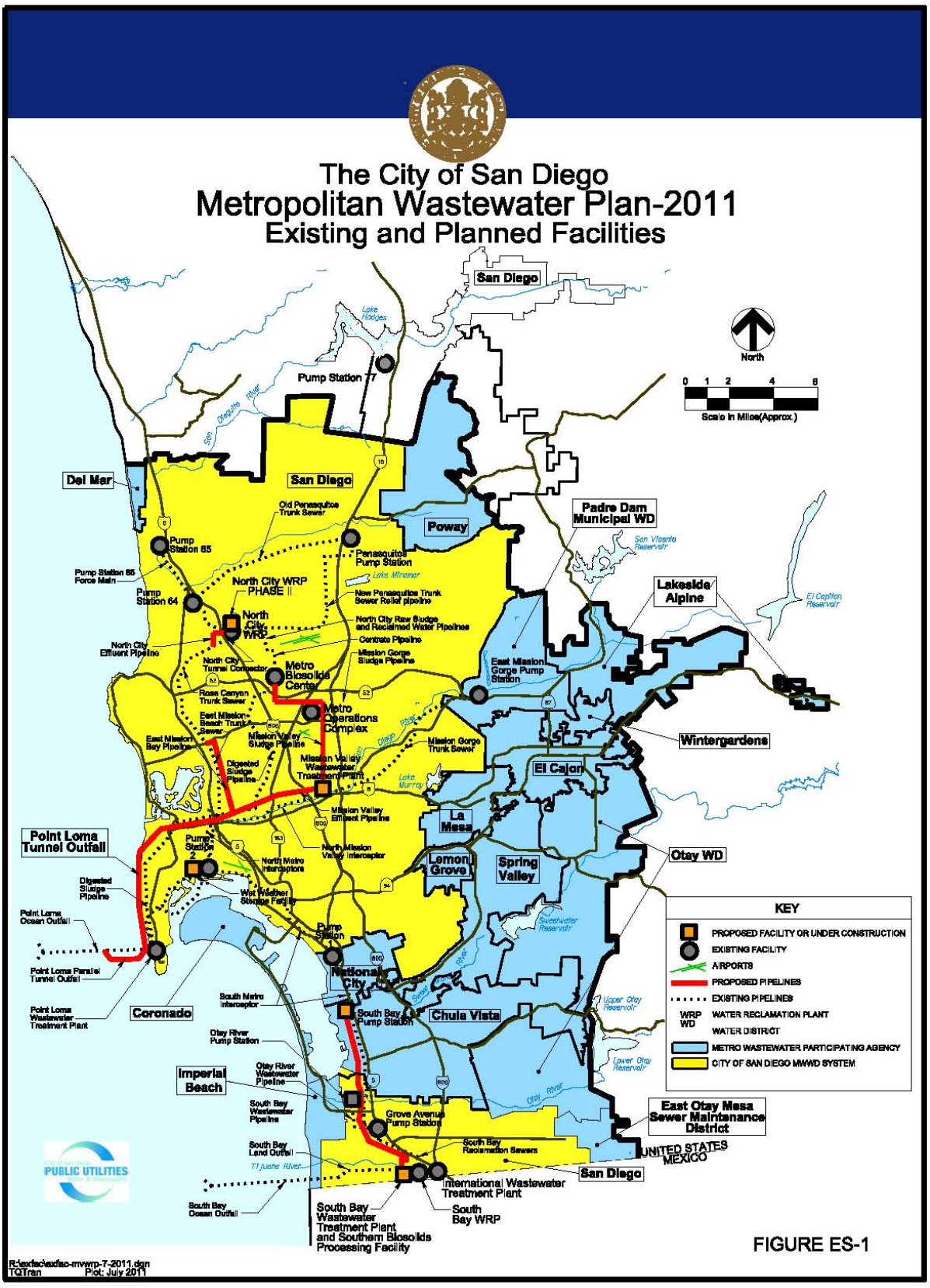
- If the ESD is **NOT** permitted at NCWRP, three 7 MG WWSFs would be required by the years 2022, 2028, and 2049 and one 14 MG WWSF would be required by the year 2038.
- If the ESD is permitted at NCWRP, two 7 MG WWSF would be required by the years 2026 and 2037, while the 14 MG WWSF would be required by the year 2040.

As the above options indicate, if ESD is permitted at the NCWRP, the total number of WWSFs would be reduced from four to three and delay the construction of the facilities. Table ES-2 and Figure ES-1 show the recommended proposed Metro's capital facilities and proposed locations, under the assumption that PLWTP continues to maintain as a CEPT facility, respectively.

Table ES-2
2012 Metropolitan Wastewater Plan
Proposed Metro Facilities

FACILITY	PROPOSED CAPACITY	ONLINE BY (2003 MWP)	ONLINE BY (2012 MWP)[7]		Estimated Total Project Cost ($ Millions)
			w/o Emergency Stream Discharge (ESD)	w/ Emergency Stream Discharge[5] (ESD)	
Wet Weather Storage Facility #1	3@ 7 MG[8]) 2@ 7 MG[9]	2011	2022, 2028,and 2049[8]	2026 and 2037[9]	276[8] 184[9]
Wet Weather Storage Facility #2	14 MG	2014	2038	2040	235
South Bay Wastewater Treatment Plant Phase I	21 mgd [4]	2018	2030	2030	373
South Bay Pump Station Phase I	21 mgd [1]	2018	2030	2030	189
South Bay Conveyance System Phase I	103 mgd [1]	2018	2030	2030	
Mission Valley Wastewater Treatment Plant	15 mgd [2]	2030	2044	2044	237
Mission Valley Effluent Pipeline	24 mgd	2030	2044	2044	59
Mission Valley Sludge Pipeline	2.11 mgd	2030	2044	2044	28
Point Loma Tunnel Outfall	162 mgd [1]	2030	2044	2044	361
North City Water Reclamation Plant Phase II	10 mgd [2]	2033	TBD[6]	TBD[6]	TBD[6]
East Mission Bay Effluent Pipeline	90 mgd [1]	2033	TBD[6]	TBD[6]	TBD[6]
North City Effluent Pipeline	90 mgd [1]	2033	TBD[6]	TBD[6]	TBD[6]
Point Loma Parallel Outfall		TBD [3]	TBD [3]	TBD [3]	TBD[6]
Total					**1,758[8]** **1,666[9]**

(1) Pump Stations and pipelines are designed to carry build-out peak wet weather flows.
(2) This facility will be built as a secondary treatment plant with the option to upgrade to a water reclamation plant.
(3) The need for this facility will be reexamined every 5 years as the inspection of the existing Point Loma Outfall is being conducted.
(4) The South Bay Secondary Treatment Facility includes a Southern Biosolids Processing Facility.
(5) Assumes 16 MGD ESD at the NCWRP. The City is currently pursuing a permit for ESD during peak wet weather flows on an emergency basis.
(6) Facility is not required within the planning horizon of this report.
(7) Online By dates for proposed facilities are based on the past ten year average TSS system-wide removal rate and a 10-year return AADF.
(8) Without ESD, three separate 7 MG facilities would be needed. One 14 MG facility would be required in each of the given years.
(9) With ESD, two separate 7 MG facilities would be needed. One 14 MG facility would be required in each of the given years.


The City of San Diego
Metropolitan Wastewater Plan-2011
Existing and Planned Facilities
San Diego
Pump Station 77
North
Scale in Miles(Approx.)
Del Mar
San Diego
Old Penasquitos Trunk Sewer
Poway
Padre Dam Municipal WD
Pump Station 65
Penasquitos Pump Station
Pump Station 65 Force Main
Pump Station 64
North City WRP PHASE II
New Penasquitos Trunk Sewer Relief pipeline
North City Raw Sludge and Reclaimed Water Pipelines
Centrate Pipeline
Lakeside Alpine
North City Effluent Pipeline
Mission Gorge Sludge Pipeline
North City Tunnel Connector
Metro Biosolids Center
East Mission Gorge Pump Station
Rose Canyon Trunk Sewer
Metro Operations Complex
East Mission Beach Trunk Sewer
Mission Valley Sludge Pipeline
East Mission Bay Pipeline
Mission Gorge Trunk Sewer
Wintergardens
Digested Sludge Pipeline
Mission Valley Wastewater Treatment Plant
El Cajon
La Mesa
Point Loma Tunnel Outfall
Mission Valley Effluent Pipeline
Pump Station 2
North Mission Valley Interceptor
Otay WD
Lemon Grove
Spring Valley
North Metro Interceptors
Digested Sludge Pipeline
Point Loma Ocean Outfall
Pump Station
National City
Point Loma Parallel Tunnel Outfall
South Metro Interceptor
Point Loma Wastewater Treatment Plant
Coronado
South Bay Pump Station
Chula Vista
Otay River Pump Station
Imperial Beach
Otay River Wastewater Pipeline
South Bay Wastewater Pipeline
Grove Avenue Pump Station
East Otay Mesa Sewer Maintenance District
South Bay Land Outfall
South Bay Reclamation Sewers
UNITED STATES
MEXICO
San Diego
International Wastewater Treatment Plant
South Bay Ocean Outfall
South Bay Wastewater Treatment Plant and Southern Biosolids Processing Facility
South Bay WRP
KEY
PROPOSED FACILITY OR UNDER CONSTRUCTION
EXISTING FACILITY
AIRPORTS
PROPOSED PIPELINES
EXISTING PIPELINES
WRP WATER RECLAMATION PLANT
WD WATER DISTRICT
METRO WASTEWATER PARTICIPATING AGENCY
CITY OF SAN DIEGO MWWD SYSTEM
PUBLIC UTILITIES
FIGURE ES-1
R:\exfiles\exfiles-mwwp-7-2011.dgn
TQTran Plot: July 2011

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this plan (2012 MWP) is to provide guidance for establishing a CIP program to meet the hydraulic needs and TSS Mass Emission Rate NPDES permit requirements. This plan updates the 2003 Metropolitan Wastewater Plan (2003 MWP) prepared by the Public Utilities Department (PUD), formerly the Metropolitan Wastewater Department, of the City of San Diego (City). This plan explains the factors driving the need for the changes, and presents specific recommended changes. This plan also discusses ongoing efforts required to ensure that the PUD continues to present a timely program of capital improvements that will satisfy all regulatory requirements and meet the needs of Metro's customers in a cost effective manner.

1.2 Metropolitan Wastewater Plan

The MWP was originally produced in August 1995, and described the Metro's capital facilities program through 2013. The 2012 MWP builds on previous planning documents, including the 1992 Consumers' Alternative, 2003 MWP and the 2010 Modified National Pollution Discharge Elimination System (NPDES) Permit.

In June 2010, USEPA issued a new five-year 301(h) modified NPDES permit to the City of San Diego,also known as the "Waiver" for the Point Loma Wastewater Treatment Plant (PLWTP). The Waiver allows the PLWTP to continue to operate as an advance or chemically-enhanced primary treatment (CEPT) facility for five years. The modified permit is required to be renewed every five years. The PLWTP is located on the south and westerly coastline of the Point Loma Peninsula. The facility receives incoming wastewater from City of San Diego and 12 participating agencies and treats through a CEPT process prior to discharging to the Pacific Ocean through a 4.5 mile ocean outfall. For the planning purposes, the 2012 MWP will assume the PLWTP continues to function as a CEPT facility with a capacity of 240 million gallons per day (mgd) for the entire duration of the 2050 planning horizon.

As stated previously, the 2012 MWP is an update to the 2003 MWP. Proposed Metro facilities in the 2003 MWP are listed in Appendix A. The planning horizon for the 2003 MWP was up to the year 2030. Facilities proposed beyond 2030 in the 2003 MWP were included because projects needed to begin prior to year 2030.

Highlights of the changes from the 2003 MWP include:

1. Decrease in the wastewater UGRs (Unit Generation Rate), as well as the SANDAG residential and employment population forecasts, have resulted in an approximately 11 percent average decrease in projected wastewater flow when compared to the 2003 MWP flows.
2. Delay the need for any additional secondary treatment in South Bay until year 2030

3. Construct Wet Weather Storage Facilities (WWSFs) in various years during the 2050 planning horizon. The timing of construction will depend on the approval for the emergency stream discharge (ESD) permit. The following two planning conditions are as follows:
    2.1 ESD (No Permit):
    Construct three 7 MG WWSFs by the years 2022, 2028 and 2049, respectively, and a 14 MG WWSF by year 2038.
    2.2 ESD (Approved Permit):
    Construct two 7 MG WWSFs will be needed by the years 2026 and 2037, and a 14 MG WWSF by year 2040.
4. A CIP Metro facility planning horizon up to the year 2050

Table 1-1 (assuming the PLWTP remains a CEPT facility) summarizes the recommended proposed capital Metro facilities.

Table 1-1
2012 Metropolitan Wastewater Plan
Proposed Metro Facilities

FACILITY	PROPOSED CAPACITY	ONLINE BY (2003 MWP)	ONLINE BY (2012 MWP)[7]		Estimated Total Project Cost ($ Millions)
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(4) The South Bay Secondary Treatment Facility includes a Southern Biosolids Processing Facility.
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(6) Facility is not required within the planning horizon of this report.
(7) Online By dates for proposed facilities are based on the past ten year average TSS system-wide removal rate and a 10-year return AADF.
(8) Without ESD, three separate 7 MG facilities would be needed. One 14 MG facility would be required in each of the given years.
(9) With ESD, two separate 7 MG facilities would be needed. One 14 MG facility would be required in each of the given years.

1.3 Driving Forces Affecting the MWP

Periodic updates of the MWP incorporate factors such as the latest information on population growth and wastewater flows, load trends within the Metro Service Area, regulations imposed by federal and state agencies, the markets for reclaimed water, and various local issues important to the City and the participating agencies served by Metro. It is expected that an update for the MWP will be issued every five years or one year after the approval of PLWTP National Pollution Discharge Elimination System (NPDES) permit. The driving forces affecting the MWP are described as follows:

1.3.1 Flow and Load Projections

Per capita wastewater flows have been declining since the early 1990s which primarily reflects the success of the regional water conservation programs implemented in response to drought conditions and the increasing cost of potable water. Today's UGR is considerably low; any further water conservation such as state legislative requirement would have more significant effects on the exterior water usage than domestic water usage. PUD has been evaluating flow monitoring data on an annual basis and information on development trends have allowed wastewater flow and load projections to be improved. The projections are important in determining the strategic location, appropriate sizing, and staging of new facilities, so that it would minimize the need of constructing additional pipelines and pump stations to convey flow to proposed facilities.

1.3.2 NPDES Permit Requirements

The 301(h) modified NPDES permit is a modification to Section 301(h) of the Clean Water Act (CWA) and is known as the “Waiver”. The Waiver specifies a set of discharge requirements to ensure compliance with the terms of the Permit itself and the Ocean Protection Reduction Act (OPRA). The PLWTP is an advanced primary treatment, or CEPT, facility treating wastewater to less-than secondary treatment. The Waiver enables the City to maintain this level of treatment and discharge the treated wastewater to the Pacific Ocean through a 4.5 mile ocean outfall. This modification has duration of 5 years, after which it expires and must be renewed. The Waiver was renewed in 2002 and 2010.

In June 2009, the California Regional Water Quality Control Board, San Diego Region, adopted the 301(h) modified NPDES permit. Then in May 2010, the US Environmental Protection Agency Region IX (USEPA) issued the final decision to approve the City’s request for a renewal of the Section 301(h) modified NPDES permit for advanced or chemically-enhanced primary treatment of discharges from the PLWTP. In June 2010, USEPA issued the new five-year modified NPDES permit. This current permit took effect on August 1, 2010 and expires on July 31, 2015. The NPDES permit specified a set of discharge requirements to ensure compliance with terms of the Clean Water Act and the California Ocean Plan.

The permit requires an 80 percent monthly average removal of Total Suspended Solids (TSS) and 58 percent annual average removal of Biochemical Oxygen Demand (BOD) on a system-wide basis.

In addition, prior to the approved 2010 NPDES permit, in 2008 the USEPA issued a Tentative Decision Documentation (2008 TDD) which stated a tentative decision to approve the City's renewal Waiver. The City proposed an "improved" wastewater discharge from the PLWTP in the Permit Application submitted in 2007. The USEPA addressed this proposition in the 2008 TDD and responded by making the following two recommendations to be carried out during the current 5-year permit:

1) Continue to maintain the ongoing program to bring additional recycled water users online in order to reduce dry-weather flow from the North City Water Reclamation Plant (NCWRP) basin to the PLWTP and Point Loma Ocean Outfall (PLOO) and South Bay Water Reclamation Plant (SBWRP) flows discharged to the South Bay Ocean Outfall (SBOO).
2) Install prototype effluent disinfection facilities at the PLWTP and perform a complete follow up study in order to assess the need for refinements or modifications to the operation of prototype disinfection facilities.

The City has been continuing efforts to achieve these recommendations.

For the purpose of long-term planning, this 2012 MWP update assumes that the PLWTP will continue to meet these requirements for the foreseeable future. Our analysis also assumes the Mass Emissions Rate (MER) of TSS to the ocean from PLWTP will not exceed 13,598 mt/yr for the foreseeable future. And that the solids discharged through the South Bay Ocean Outfall are not included as part of the 13,598 mt/yr MER

1.3.3 Water Reclamation and Requirements

The OPRA legislation required the City to provide a total of 45 mgd water reclamation capacity by the year 2010. This requirement was met with the construction of the 30 mgd NCWRP in 1997 and the 15 mgd South Bay Water Reclamation Plant in 2002.

The 2008 TDD required the City to investigate the potential for increased wastewater reclamation and recycling as part of the conditions for approving the City's renew waiver for wastewater discharge. The California Coastal Commission (CCC) made the following conclusion regarding the City's efforts:

> *"The City will return for a public hearing before Coastal Commission in approximately two years when its study of Wastewater Reclamation and Recycling Opportunities Study or Recycled Water Study (RWS) is completed and the findings and recommendations have been documented in a report. As determined by the Commission, the City submitting the report and participating in any commission hearings on the report shall constitute full compliance with this condition."*

The City's Cooperative Agreement with San Diego Coastkeeper and the San Diego Chapter of Surfrider Foundation was approved in February 2009. This resulted in the RWS referenced above by the CCC. The RWS was completed July 2012.

1.3.4 Hydraulic Limitations and Spill Prevention

The need to provide an adequate hydraulic capacity for the Metro System has always been an important driving factor in facilities planning. As with the 2003 MWP, the 2012 MWP includes facilities that are needed to reduce the peak wet weather loading on the Metro Interceptors and eventually PS1 and PS2 and the PLWTP. The 2012 MWP recognizes that higher than expected flows occur during storm events. The high flows occur during and immediately following periods of rainfall due to direct or indirect entry of storm water into the sewer system. This additional wastewater flow is called Rainfall Dependent Infiltration and Inflow (RDI/I). RDI/I is the primary contributor of high peak flows in the Metro system. The magnitude and duration of RDI/I depends on the intensity and spatial/temporal distribution of rainfall occurring during a storm event. It also depends on the condition of sewers and possible cross connection to sewers. Since the 2003 MWP was completed, the PUD has increased the number of flow meters and gathered more data to better project peak flows and to identify hydraulic limitations in the Metro system more accurately. As a result of the improved and additional data, recent state of the art modeling capabilities and development of peak flow management strategy, the PUD has been able to provide better projections and facilities planning. The peak flow management strategy is an operational strategy to optimize the use of existing facilities to avoid overflows whenever possible. For example, coordinated pumping between PS1 and PS2 optimizes the in-system storage and/or to store sewage in the available tanks at the NCWRP and the Metropolitan Biosolids Center (MBC) during the storm to shave off the peak flow at PS2 and Point Loma Plant.

In addition, on an annual basis, inflow and infiltration (I/I) analysis and studies have been conducted and based on the rain event(s) with sufficient wastewater flow data obtain from the City flow meters that may have a potential of impact to the Metro sewage system. There are a number of variables that can skew the outcome of the I/I analysis such as: (1) rainfall distribution and intensity (I/I contributions to the sewer system are seasonal and rain dependent. Rain events are seasonal and varies from season to season and even within the same season); (2) antecedent conditions; (3) geographical areas; (4) unknown cross connections (storm drain-sewer connections); (5) annual on-going inspection, maintenance, rehabilitation and replacement program for aging vitrified clay (VC) pipes (new pipes may reduce the I/I contributions but as a large drainage basin, other existing sewer pipes continue to deteriorate which still subject to I/I contributions in some level of magnitude). These different variables make it difficult to compare between rain events or years; or correlate between I/I reduction and department annual program of sewer pipe inspection, maintenance, rehabilitation, and replacement. Based on the recent I/I analysis there were no conclusive findings between I/I reductions and the department annual

program of sewer pipe inspection, maintenance, rehabilitation, and replacement. However, the I/I analyses results implied that the program does contribute to some level of I/I reduction. The results of the analysis provide findings and recommendations for identifying CIP projects (trunk sewers) or high I/I areas for further study to reduce I/I contributions.

1.4 Organization of this Status Plan

Each one of the driving forces listed above was analyzed for their impacts on the 2012 MWP proposed facilities. The next three sections of this plan summarize the findings of the analyses and identify facility deficiencies and needs. The final section represents the recommendations and their justifications.

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2.0 WASTEWATER FLOW AND LOAD PROJECTIONS

2.1 Annual Average Daily Wastewater Flow

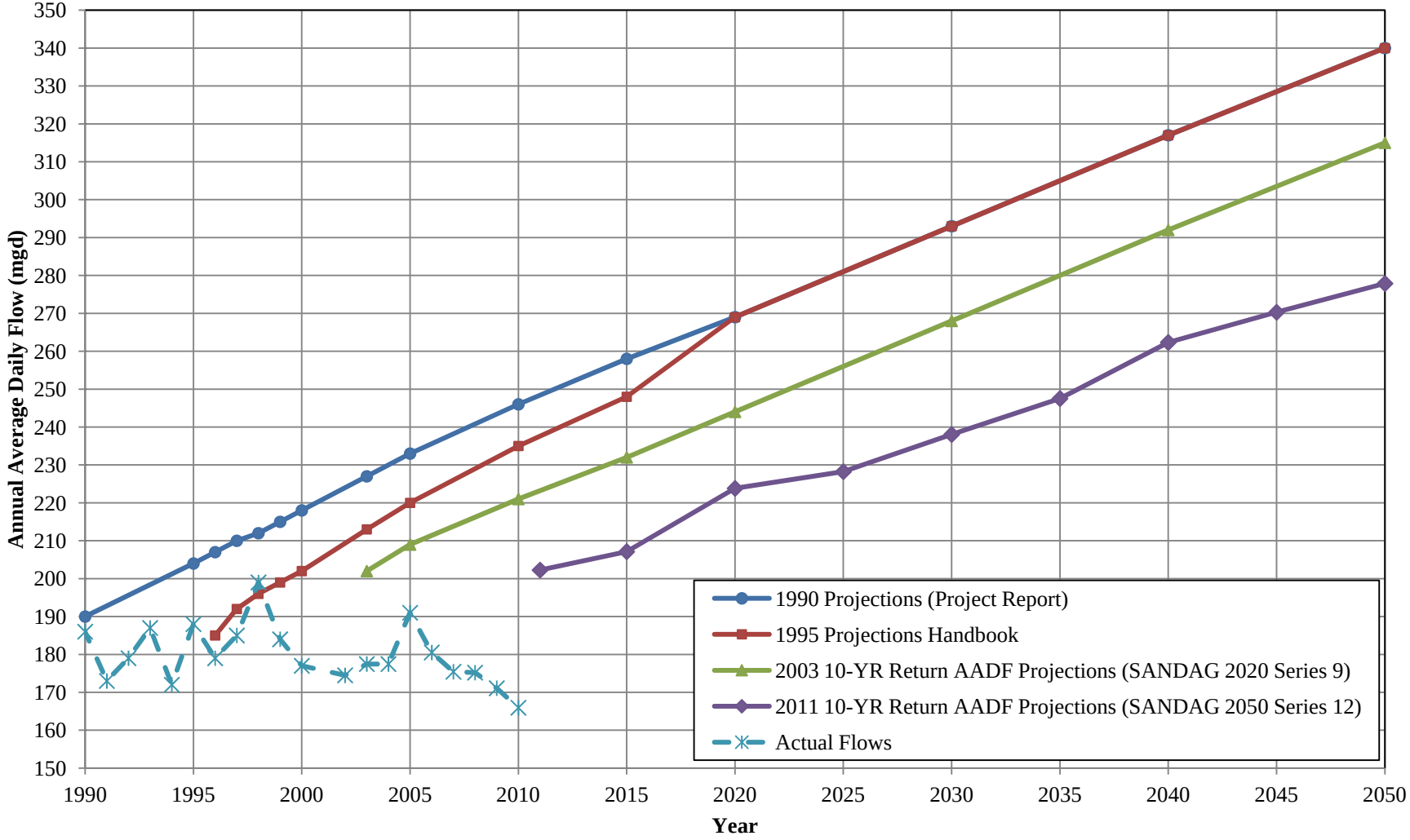
Projections of annual average daily flow (AADF) generated within the Metro service area are updated on a regular basis to reflect the latest available information and trends in population growth, per capita wastewater flows, and population-independent flows (e.g. inflows/infiltrations (I/I), military, special industries, truck-hauled sewages, sludge returns, etc.). Table 2-1 presents the system-wide calendar year flow projections made in fiscal year 2011. These flows are based on the SANDAG Series 12: 2050 Regional Growth Forecast, which is a projection of population, housing, land use, and economic growth for the San Diego Region. SANDAG produces a new forecast every three to five years to incorporate updated data, changing trends, and new policies. Each forecast SANDAG produces, the series number increases, e.g., the current forecast is known as the 2050 Regional Growth Forecast (2010, Series 12); prior forecasts included the 2030 Regional Growth Forecast Update (2006, Series 11), 2030 Cities/County Forecast (2003, Series 10), and the 2020 Forecast (2000, Series 9). These projections, and the associated breakdowns by sub-area and Metro facility tributary area, have been used in the most recent planning work. Also shown in Table 2-1 are the previous projections used in the 1990, 1995, and 2003 planning studies. Figure 2-1 illustrates the current flow projections in comparison to the previous flow projections on a calendar year basis. When compared to the 2003 projections, the 2011 flow projections are significantly lower, by approximately 11 percent, mainly due to a decline in wastewater UGR. It should be noted that between the 2003 MWP and the 2012 MWP, there were two interim flow projections developed based on SANDAG Series 10: 2030 and SANDAG Series 11: 2030. Both of these flow projections were approximately 7 percent lower than the 2003 MWP projections.

Table 2-1
2012 METROPOLITAIN WASTEWATER PLAN
SYSTEMWIDE FLOW PROJECTIONS

Calendar Year	1990 Projections: Project Report[a] (mgd)	1995 Projections: Handbook[b] (mgd)	2003 AADF Projections: SANDAG Series 9: 2020[c] (mgd)	Actual Flows FY[d] (mgd)	FY 2011 10-year AADF Projections: SANDAG Series 12: 2050[c] (mgd)
1990	190	-	-	186	-
1995	204	-	-	182	-
1996	207	185	-	180	-
1997	210	192	-	185	-
1998	212	196	-	199	-
1999	215	199	-	184	-
2000	218	202	-	177	-
2003	227	213	202	178	-
2005	233	220	209	191	-
2010	246	235	221	166	-
2015	258	248	232	-	207
2020	269	269	244	-	224
2025	-	-	-	-	228
2030	293	293	268	-	238
2035	-	-	-	-	248
2040	317	317	292	-	262
2045	-	-	-	-	270
2050	340	340	315	-	278

a) Annual Average Daily Flow (AADF), excludes internal system return flows from upstream wastewater processing facilities. Flows up to 3 mgd from Tijuana were included in the 1997 to 1999 projections.
b) Values expressed in the Permit Application process and the 1995 Metropolitan Wastewater Plan.
c) The AADF included a wet weather component based on a 10-year return annual average daily flow and accepted by the City and Metro Commission for facility planning purposes.
d) The actual flow is the measured flow during that fiscal year and it could associate with 1-year return flow or 2 year return flow event (wet weather component). The actual flow is significantly less than the projected flow (10-year return AADF).
e) Per planning purposes, flow projections in this report used the Highest UGRs observed within the past 5 years.

FIGURE 2-1
PROJECTED SYSTEMWIDE WASTEWATER FLOWS



Two factors have led to a decreasing flow rate:

- The 2003 MWP utilized flow projections based on the SANDAG Series 9: 2020 population and employment projections, while the 2012 MWP uses SANDAG Series 12: 2050 population and employment projections. In comparison between the two series, the difference in employment population projections is minimal while SANDAG, Series 12 residential population projections are significantly lower than SANDAG Series 9 projection as seen in Figure 2-2. The residential population projected to drop by an average of 8%, while the employment population projected to drop by an average of 1%. The residential population has a significant part in flow projection calculations. This large decrease in residential population has a significant effect on the current flow projections.
- The updated flow projections presented in this 2012 MWP are based on continuing evaluation of metered flow data obtained in the past decades. A system-wide sewer model was utilized to assess separate UGRs for the residential and commercial/industrial employment populations. UGR is gallons per day of wastewater generated per person (capita). The product of the UGR and the total accumulated population provides an equivalence average dry weather flow. Per capita wastewater flows have been declining since the early 1990s, which primarily reflects the success of water conservation programs implemented in response to drought conditions and the increase in the cost of potable water. The UGR is another significant factor used in the current flow projection calculations.

Table 2-2
2012 METROPOLITAN WASTEWATER PLAN
UGR and SANDAG Comparison

		2003 MWP	2012 MWP	% Declined from 2003
UGR (1)	Residential	75	72.1	-4%
	Employment	23.6	22.3	-6%
SANDAG Regional Growth Forecast (2)	Residential	Series 9	Series 12	-8%
	Employment			-1%

(1) 2003 MWP and 2012 MWP are based on the highest actual UGR observed within the system past 5 years of each report completion date.
(2) The 2003 MWP and 2012 MWP were based on the SANDAG: Series 9 and SANDAG: Series 12 Population and Employment Projections, respectively.

Figure 2-2
Composite Unit Generation Rate - UGR
(gallons per day per capita)

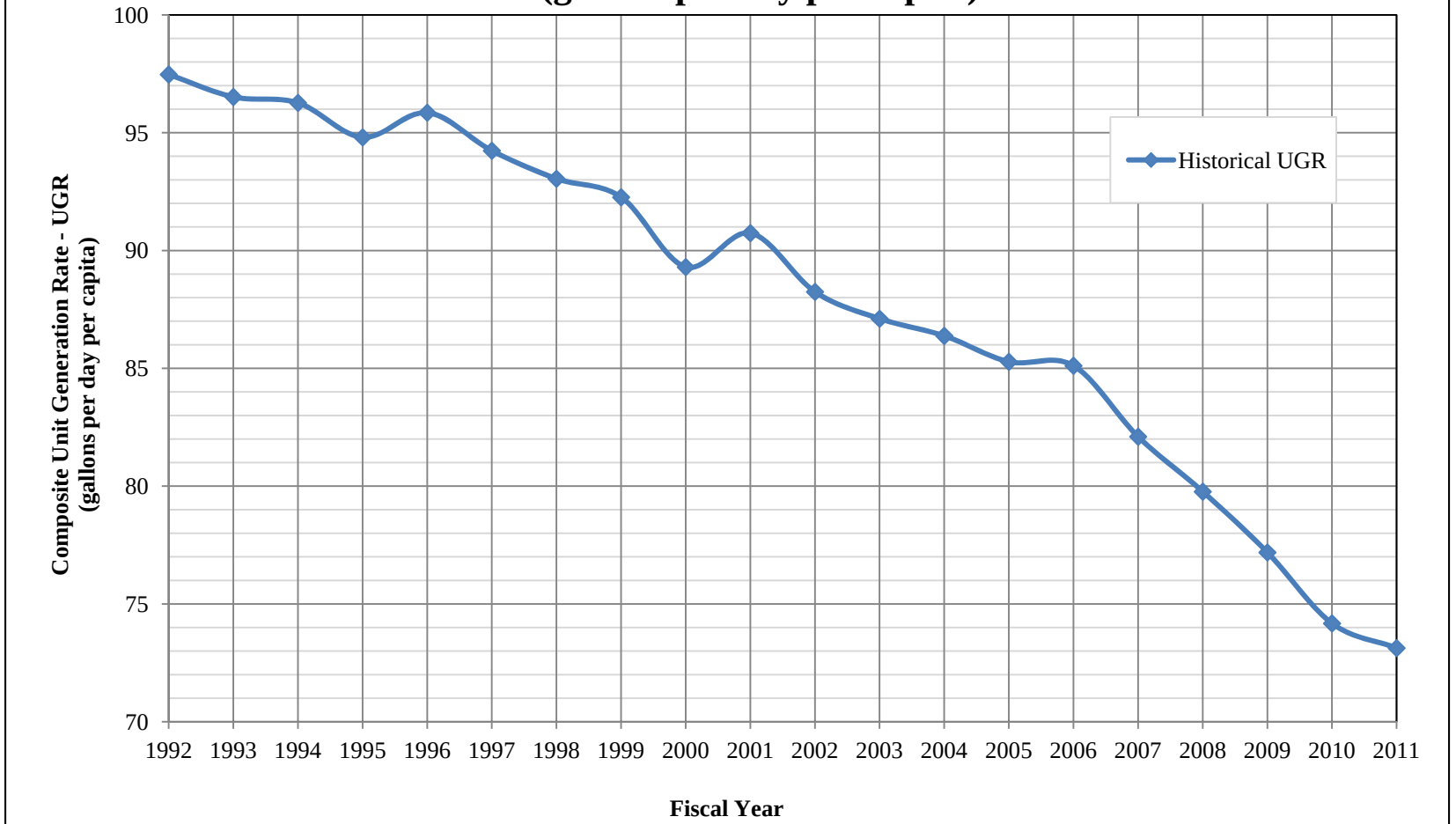
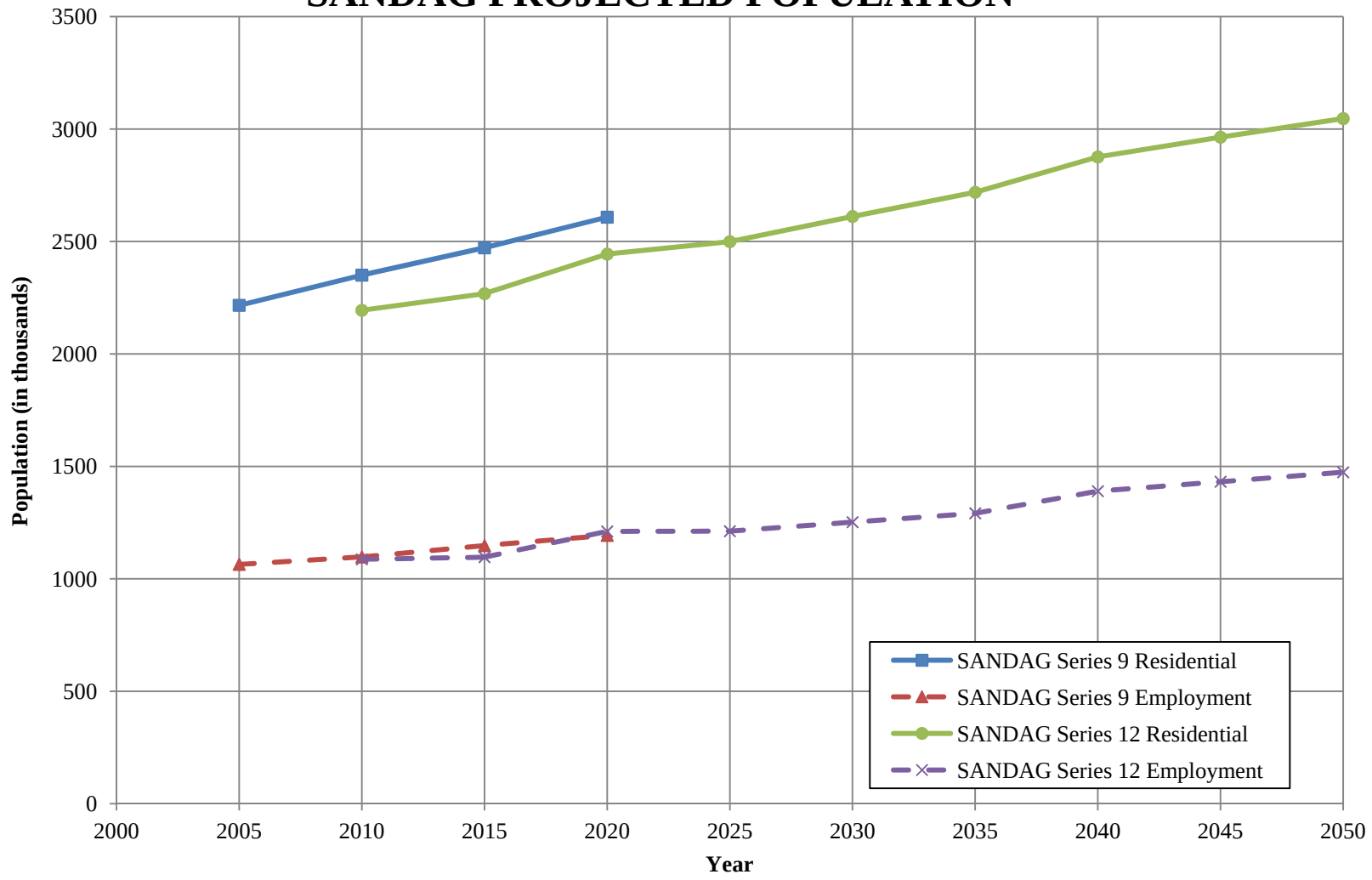


FIGURE 2-3
SANDAG PROJECTED POPULATION



2.2 10-Year Return AADF

Variations in rainfall from year to year can result in significant variations in Inflow and Infiltration (I/I). For example, from 1998 (a wet year) to 2002 (a dry year), the AADF declined from 199 mgd to 175 mgd measured at Pump Station #2. Approximately 10 mgd out of the 24 mgd difference was attributed to the Tijuana, Mexico emergency discharge in 1998. The 14 mgd I/I component, which was about eight percent of the dry weather flows, was contributed from within the Metro sewage system. Based on the 62-year rainfall data, a continuous hydrological model simulation of the wet weather peak flows in the past decade shows that variations in annual rainfall could add up to 9 to 12 percent of dry weather flow as the I/I component in the AADF. This master plan utilizes a 10-year return annual average daily flow (equivalent to 9.6 percent of the dry weather flow) which includes the I/I variations.

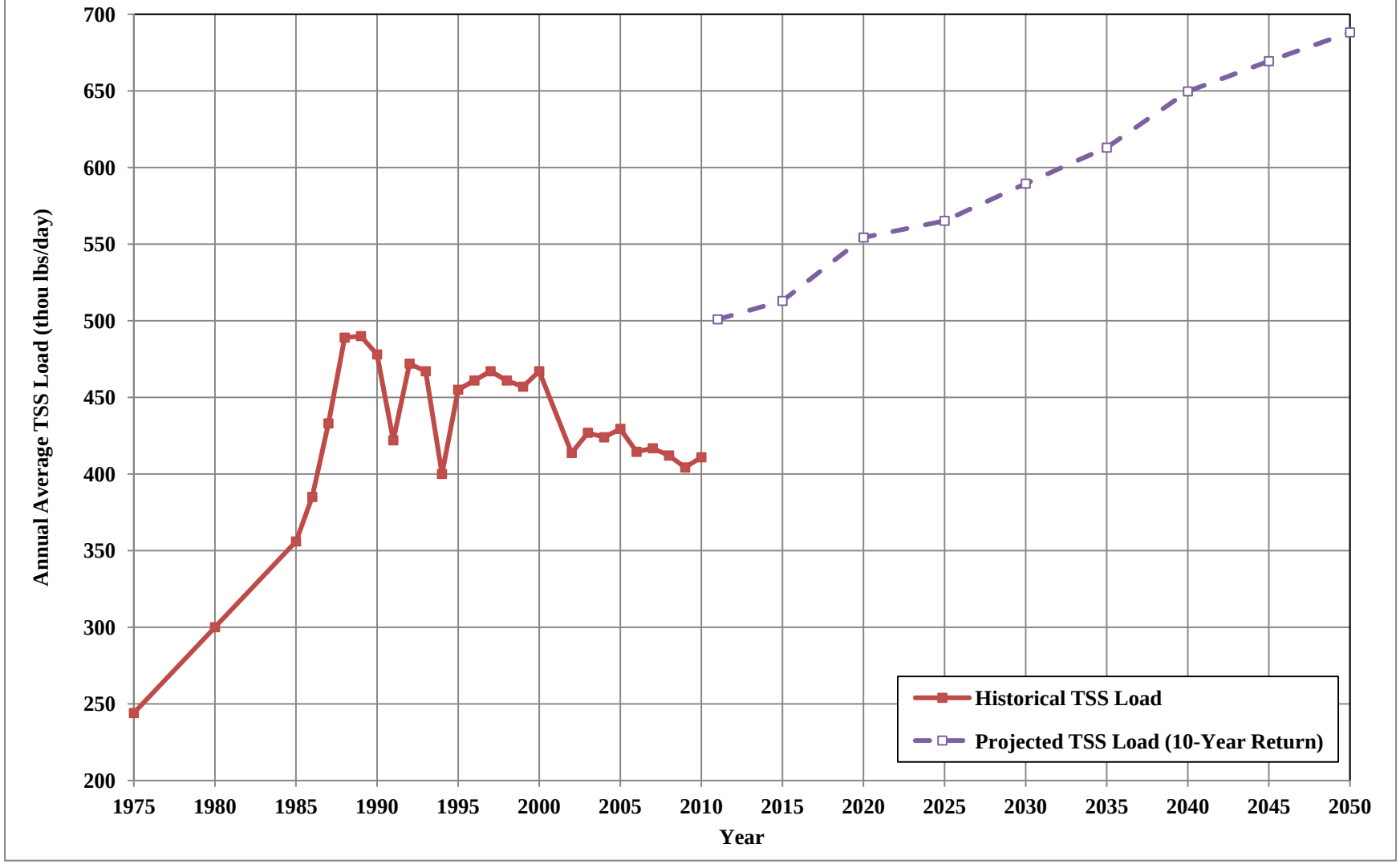
A detailed description of flow projection method is presented in APPENDIX A for reference.

2.3 Annual Average Waste Loads

Projections of average annual waste loads generated within the Metro service area are needed to determine treatment requirements in order to maintain the MER below the maximum of 13,598 mt/yr. Updated projections have been made based on the 2010 AADF and the results of strength based billing monitoring efforts initiated in 1998, as well as monitoring data from the PLWTP.

Figure 2-3 indicates that prior to the year 2000 TSS load has varied, as have the AADFs. In the last 10 years the loads have fluctuated, generally following the same rise and fall. As with flows, the unit generation rates for loads (pounds per day per capita) have also declined since the early 1990s. These projections are for total system-wide loads, and higher or lower wastewater strengths occur in different portions of the Metro system. However, due to the fluctuations of waste strengths, the highest annual average TSS strength that occurred in the last five fiscal years was used to calculate the load projections to ensure the conservativeness in planned facilities. The annual average TSS concentration of 297 mg/l is applied to this MWP report.

Figure 2-4
HISTORICAL AND PROJECTED SYSTEMWIDE TSS WASTELOADS



2.4 Peak Wet Weather Flows

Peak wet weather flow projections are required to anticipate hydraulic capacity limitations in the existing facilities and to determine design capacities for future facilities. Prior to the 2003 MWP, peak wet weather flows were computed by multiplying the 10-year return flow AADFs by peaking factors. A peaking factor of 1.8 was used for peak flow projections at Pump Station 2 (PS2) and PLWTP, and a factor of 2.1 was used for peak flow planning at Pump Station 1 (PS1) and other upstream facilities. These peaking factors were based on observed peak flows at these locations during major storms, but the probability of occurrence of these design peak flows was not estimated.

The 2012 MWP recognizes the need to further define realistic peaking factors in different trunk sewers and to model the effects of planned treatment facilities on reducing downstream peak flows. Subsequent flow monitoring and modeling have been performed to better quantify peak flows as a function of probability of occurrence. The results of the analysis allow peak flow criteria to be expressed in terms of an acceptable level of performance (i.e., risk of an overflow). Adopting criteria based on acceptable risk of overflow has become standard practice for design of wastewater conveyance facilities in recent years, with communities adopting design criteria appropriate to their site-specific conditions (impacts of overflows, customer expectations, cost of improvements required, etc.).

The City believes that the "10-year return AADF" is the appropriate basis for wastewater facility planning. By definition, a peak flow equal or higher than a "10-year return AADF" has a 10 percent chance of occurring in any given year. Conveyance facilities designed for this criterion would be expected to overflow only once every 10 years on average. The "10-year return AADF" wet weather flow projections were used in conjunction with dynamic hydraulic modeling to determine when the capacities of Metro facilities would be reached, and to analyze alternative ways to handle excess flows. Section 4.0 describes the findings of the hydraulic analysis.

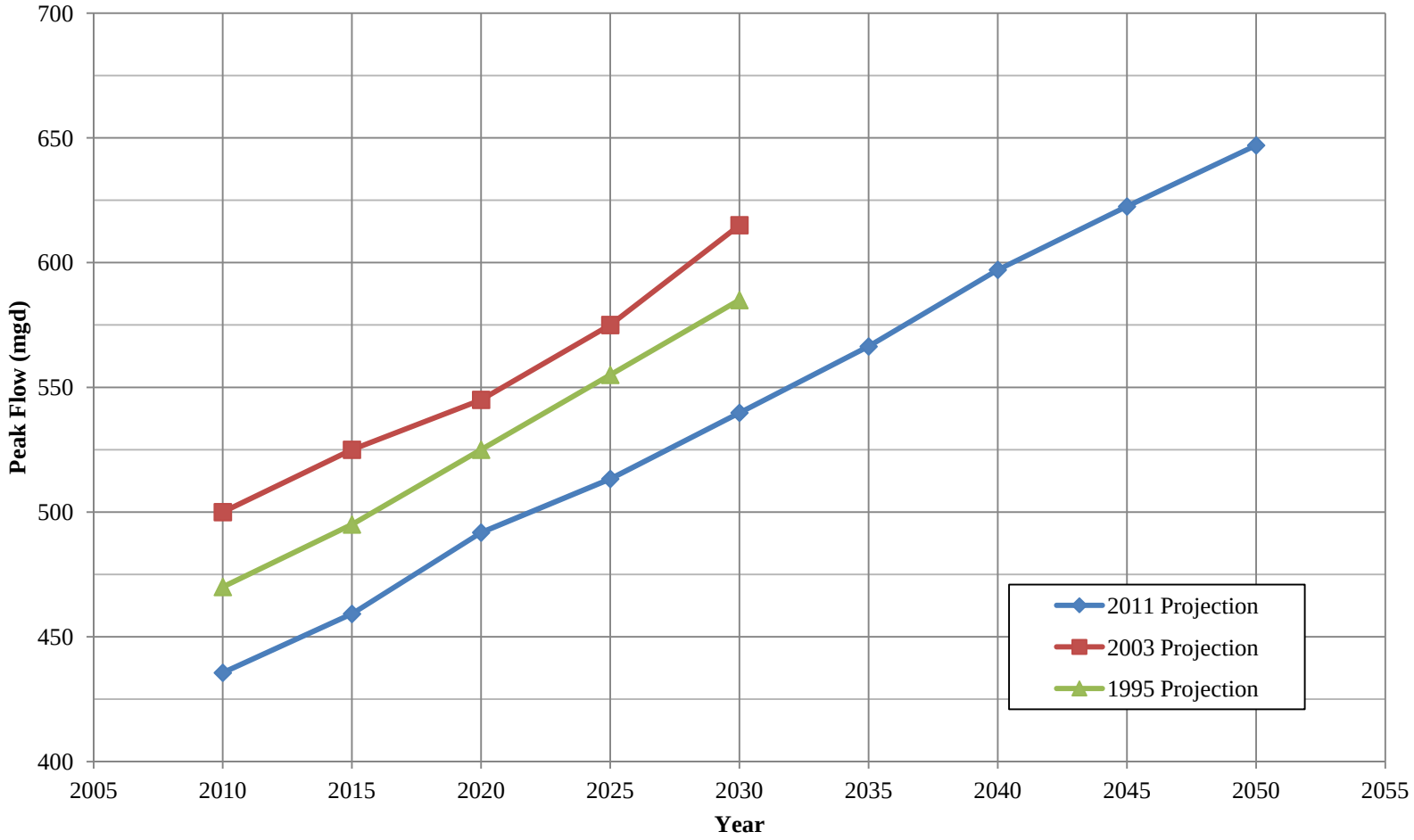
The peaking factors were established based on a continuous hydrological model of Metro System flows that was used to develop statistics on the frequency, duration, and volume of peak wet weather flows. The model used 62 years of hourly average rainfall data. Rainfall dependent I/I and groundwater infiltration were separately modeled, accounting for the effects of antecedent rainfall. The antecedent rainfall effect is what accounts for the dramatic increase in I/I (expressed as a percentage of rainfall) that occurs if a storm event is preceded closely by other storms as opposed to occurring after a dry weather period.

Calibration of the model was based on several months of observed flows at PS1 and PS2. The modeled wet weather flows were added to the projected diurnally-varied AADFs (after subtracting the I/I component of the AADFs to avoid double counting) to estimate the total peak

flows. Statistical analysis of the resulting modeled hourly flows was performed to estimate the probabilities of peak flows of any given magnitude in any given future year.

In the 2003 MWP, for planning purposes, the I/I component was generally assumed to increase at a rate proportional to the increase of population growth. After 2003 MWP, the I/I component was reevaluated using the hydrological model based on the historical flow monitoring data from the wet years of 1998 to 2005 to quantify the average annual increase in I/I. Over those seven years, the hydrological model indicated that I/I appeared to have increased by about 1.5 percent per year. Therefore, the 2012 MWP will assume a rate of increase in I/I of 1.5 percent per year for projected peak flows. This rate of increase is considered to be conservative as it does not account for any significant reductions in I/I as a result of the sewer rehabilitation and replacement projects that will be performed in the service area. Representative results of the peak flow system-wide analysis are shown in Figure 2-5.

Figure 2-5
SYSTEMWIDE PROJECTED PEAK FLOWS



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3.0 MASS EMISSION RATE ANALYSIS

3.1 Mass Balance

A computer model was used to predict the effluent mass emissions of TSS from the PLWTP. The model was originally developed to support Metro's permit application and was used during the development of the 2003 MWP.

The model computes the amount of TSS discharged to the ocean based on the influent flows, concentrations, and specific parameters on treatment process performance at each plant such as the chemical dosages, recycle streams, and sludge qualities. The model predicts the effluent loadings for any given year, considering the changing makeup of the influent streams as new facilities are brought into service. For example, future facilities such as the SBWTP and solid handling facility will change the makeup of the TSS in the influent stream because the wastewater and solids will not be returned to the system and be retreated at the PLWTP. Provisions are made for separate removal efficiencies for raw wastewater, secondary effluent discharged to the sewer system from upstream reclamation plants (excess above demand for reclaimed water), raw sludge discharged to the sewer system prior to construction of biosolids facilities, and centrate returned from operating biosolids facilities.

3.2 MER Projections

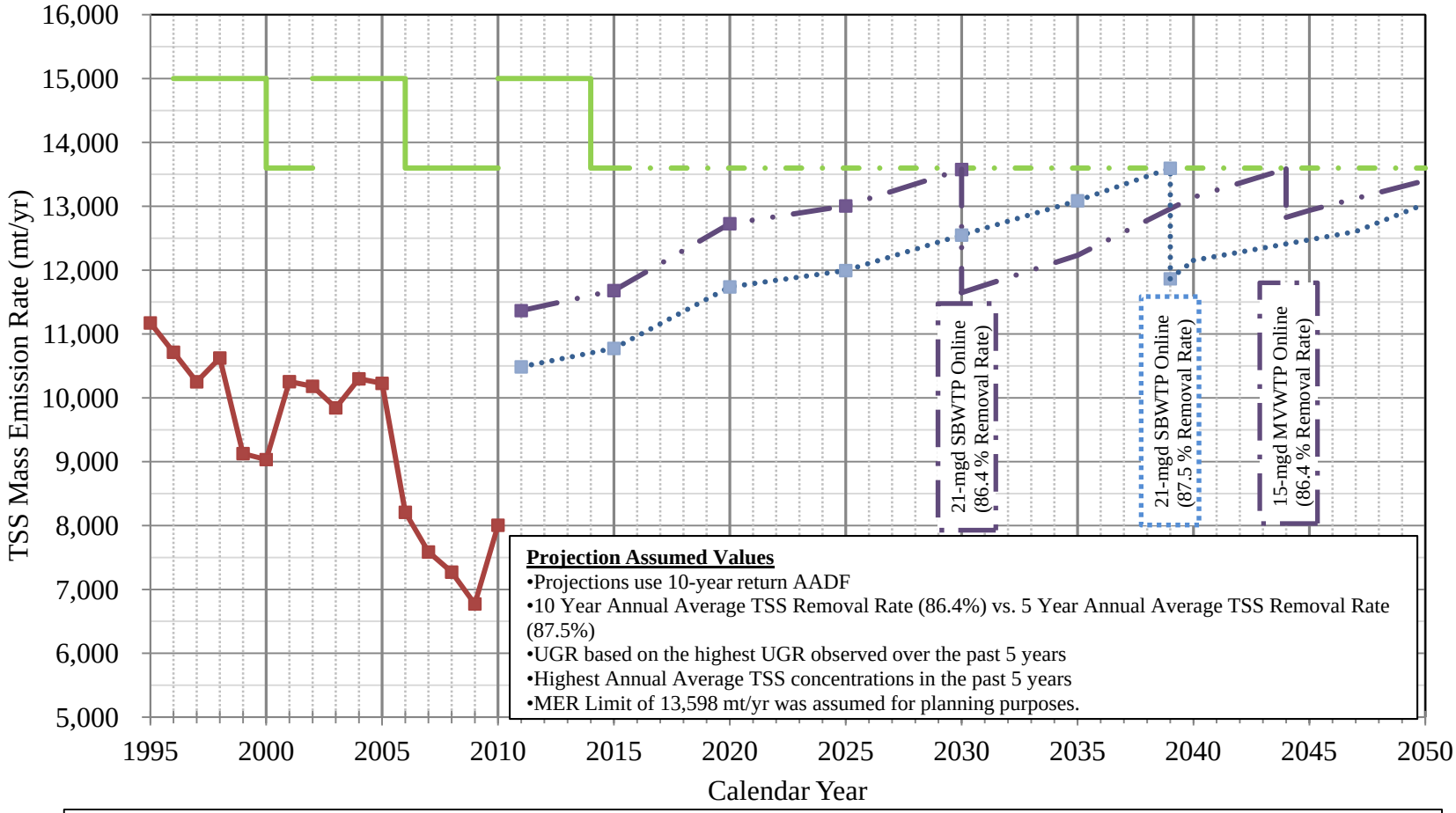
Historical performance of the PLWTP as a CEPT facility suggests that the regulatory requirements of 80 percent TSS removal and a maximum MER of 13,598 mt/yr are achievable on a long-term basis. Under the assumption that the NCWRP, the MBC, and SBWRP are all operational and that no other facilities affecting the MER are built, the projected MER is expected to reach 13,598 mt/yr by the year 2030. The City would need to have additional wastewater treatment and solid handling facilities operational by the year 2030 in order to maintain the MER below 13,598 mt/yr. This report examines a 21 mgd South Bay Wastewater Treatment Plant (SBWTP) with an additional South Bay Sludge Processing Facility, shown in Figure 3-1. It is important to mention that the MER measured in the last several years reflect lower numbers than the MER computed with the mass balance model. The reasons for the differences are as follows:

- The flow projections used in the mass balance model assumes a wet weather component equivalent to the 10-year return flow, which has not occurred in the last several years.
- The system-wide TSS projection used in the model assumed the highest annual average TSS concentration (297 mg/L) observed in the last five years.
- The mass balance model assumes a system-wide TSS removal rate at PLWTP is an average plant's actual removal rate. The removal rate used in the mass balance model was determined by the annual average system-wide TSS removal rate (86.4%) observed at the plant over the last ten years. However, over the most recent five years, the actual annual average system-

wide TSS removal rates (87.5%) have been improved and observed to be higher. Using this higher system-wide removal rate, the projected MER will reach the limit by the year 2039. Both removal rates were modeled to forecast the timeframe required for initiating facility planning. However, the lower of the two average removal rates is assumed for planning purposes.

The PUD believes that with the above assumptions, an adequate safety factor exists to allow for variations in wastewater flows and loads.

Figure 3-1
TSS MASS EMISSION RATE WITH PLANNED TREATMENT FACILITIES



3.3 Uncertainty in MER Projections

The year in which an MER maximum of 13,598 mt/yr will be reached is sensitive to several variables and assumptions in the analysis that are uncertain at this time. The timing of implementing the proposed Metro facilities can potentially be influenced by a numbers of factors before the MER maximum is reached.

Factors which will potentially influence the timing of implementing the proposed Metro facilities before the MER maximum is reached are as follows:

- New regulatory requirements
- Influent TSS loads changes due to population growth, UGR and/or industry.
- TSS system-wide removal rate changes at the PLWTP.
- More efficient and cost effective alternative treatment technologies remove additional TSS at PLWTP.
- New options that are feasible and implementable to offload PLWTP

3.4 Treatment Facilities Requirements

Based on the MER projections and the associated uncertainties, it is prudent to proceed with planning and preliminary design of facilities in the South Bay that could reduce MER by the year 2030. As noted earlier, the 2003 MWP proposed these facilities to be online by 2018. As shown in Figure 3-1, construction of the 15 mgd South Bay Water Reclamation Plant (SBWRP) in 2001 and lower SANDAG 2050 projections postponed reaching the MER maximum until 2030. At that time, a 21 mgd SBWTP will be needed. The SBWTP will provide relief until 2044 when the 15 mgd Mission Valley Wastewater Treatment Plant (MVWTP) is required. The MVWTP will provide relief beyond the 2050 planning horizon of this report. Even though NCWRP's existing footprint is sufficient for expansion to accommodate additional flows, the MVWTP was proposed to precede the NCWRP Phase II because the projected wastewater flows generated in the North City Basin are insufficient to meet the proposed additional 10 mgd capacity of NCWRP Phase II. All analyses assume the TSS discharge at a maximum of 13,598 mt/yr and removal rate remain the same throughout the planning horizon.

Further monitoring, testing, and analysis of MER will continue to be performed in order to reduce uncertainties, refine facilities staging, and provide information for the City to use in future permit applications.

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4.0 HYDRAULIC ANALYSIS

4.1 Hydraulic Model

A dynamic hydraulic model of the Metro interceptors and pump stations has been developed and used to determine when and where capacity deficiencies in the existing system will occur. The model was also used to determine whether or not future treatment facilities, which would be required to remain below the maximum allowable MER limit, would also adequately meet the capacity requirements.

Physical information on the interceptors and pump stations as well as dry and wet weather data were input into the InfoWork modeling software. The model was calibrated using monitored flow and water level data taken during several dry and wet weather periods. The calibrated model is capable of predicting time-varying water levels throughout the interceptor system, accounting for dynamic routing, backwater and in-system storage effects.

4.2 Critical Capacity Problems

Modeling results show that under projected future conditions corresponding to a major storm event, the first facility to reach its critical capacity would most likely be PS2 (432 mgd), followed closely by PS1 (160 mgd), and then by several reaches of the South Metro Interceptor (SMI) between PS1 and PS2. The SMI sections upstream of PS1 and the North Metro Interceptor (NMI) are found to be non-critical. It is important to note that the design capacity of PS2 was originally 432 mgd, which is the same as the hydraulic capacity of the Point Loma Treatment Plant. However, historical data indicates PS2 firm capacity ranges from 413 mgd to 430 mgd. For the purpose of this Plan, it is assumed that the firm capacity for PS2 is 413 mgd.

4.3 Peak Flow Management Strategy

The Wastewater Peak Flow Management Strategy, developed in 2002-2003, is used to guide the operation of the City's major wastewater facilities during extreme wet weather events when peak flow approach or exceed the facilities' capacities. One objective of this strategy is to optimize the use of existing facilities to avoid overflows whenever possible, and to minimize and control all unavoidable overflows. Another objective is to quantify the effectiveness of the strategy relative to the proposed wet weather storage facilities.

Numerous control measures were investigated to optimally utilize the existing facilities to either temporarily store or divert the excess flows to minimize peak flows impact. Among those deemed viable, the use of equalization tanks at the NCWRP, Miramar Reclaimed Water Tank, MBC digesters, and the in-system storage in the Metro Interceptors were included as control measures for the emergency storage, while SBWRP was included for flow diversion during extreme wet weather events. The total effective storage volume, available by using the previously mentioned storage facilities was quantified to be 12 million gallons based on dynamic

modeling analysis using 1998 wet weather flow data (See Figure 4-1). This additional storage volume was not contemplated previously in the Metro planning.

The Peak Flow Management Strategy described previously is based on optimizing storage capacity of the existing facilities to accommodate excess wet weather flow; however, this strategy only provides sufficient storage for current peak wet weather flow conditions. For future flow conditions, the hydrological model was used to determine the additional required storage. The model included the existing available storage and future facility capacities that are required to reduce the mass emission discharge at PLWTP. The simulated model determined the volume of peak wet weather flows that would approach or exceed the capacity of Pump Station 2 (PS2). The excess volume of PS2 would constitute as an additional required storage. Two TSS removal rate scenarios were analyzed and modeled.. Under the assumption of an average system-wide TSS removal rate (86.4 percent) observed in the last ten years, it's anticipated that without ESD, four Wet Weather Storage Facilities (WWSF) would be required (see Figure 4-1). Three 7 MG WWSF would need to be in place by the years 2022, 2028, and 2049. One 14 MG WWSF would be required by the year 2038. With the addition of 16 million gallons ESD, the total number of WWSFs would reduce to three, as seen in Figure 4-2. Two 7 MG WWSF would be delayed until the years 2026 and 2037, while the 14 MG WWSF would be delayed until 2040.

Under the assumed average system-wide TSS removal rate of 87.5 percent observed in the last five years, it's anticipated that without ESD, the construction of five WWSFs would be required. Four 7 MG WWSFs would be needed by the year 2022, 2028, 2045, and 2049. A 14 MG WWSF would be needed in 2032. With the addition of 16 million gallons ESD, the construction of three required 7 MG WWSFs would be required by 2026, 2031 and 2049. One 14 MG WWSF would be required in the year 2035. To assure their effectiveness, the storage volumes quantified in the above strategies should be verified based on actual field data whenever available.

4.4 Hydraulic Relief Strategy

Other than the basic control measures called out in the Peak Flow Management Strategy, modeling analyses suggested that there is no inexpensive way to significantly increase the capacity of the Metro System by relieving one or two short "bottlenecks". Any improvement to increase the hydraulic conveyance capacity of the Metro system would require coordinated expansions to PS1, PS2, the PLWTP, and the SMI.

Besides being very costly and disruptive, providing more interceptors and pumping capacity to convey higher flows to the PLWTP is fundamentally inconsistent with the City's strategy to maintain the PLWTP as a 240 mgd advanced primary facility.

To reliably provide hydraulic relief, the treatment facilities should have a "fail-safe" method to discharge their effluents, i.e., an outfall or storage capacity. Since the City has the capacity in the South Bay Ocean Outfall (SBOO), all of the critical South Bay facilities (PS1, SMI, PS2, and

the PLWTP) can reliably reduce their peak flows. Unlike SBWRP, the NCWRP currently has no outfall or storage capacity and therefore provides only limited hydraulic relief to the downstream facilities, as outlined in the Peak Flow Management Strategy.

Assuming PLWTP continues to operate as a CEPT facility, the most effective strategy of providing hydraulic relief, supplying reclaimed water, and meeting MER requirements is to construct a secondary treatment facility in the South Bay with the option to upgrade to a water reclamation plant by the year 2030. Beyond 2030, when the majority of the South Bay flow is being diverted, building the MVWTP along with the required outfall pipelines, as required for MER reasons, will provide further hydraulic relief. Figure 4-1 shows the results of hydraulic analysis which indicates that the treatment plant capacities and staging needed to meet projected MER requirements (shown in Figure 3-1) would be adequate to provide hydraulic relief as well.

Additionally, analysis of storage facilities indicates that they could provide a cost-effective way of reducing peak flows many years before the treatment facility is constructed to meet the MER requirements. Storage can be provided in either standard storage tanks or in tunnels within proximity of PS2.

Figure 4-1

Wet Weather Storage Requirement
12 MG In-System Storage

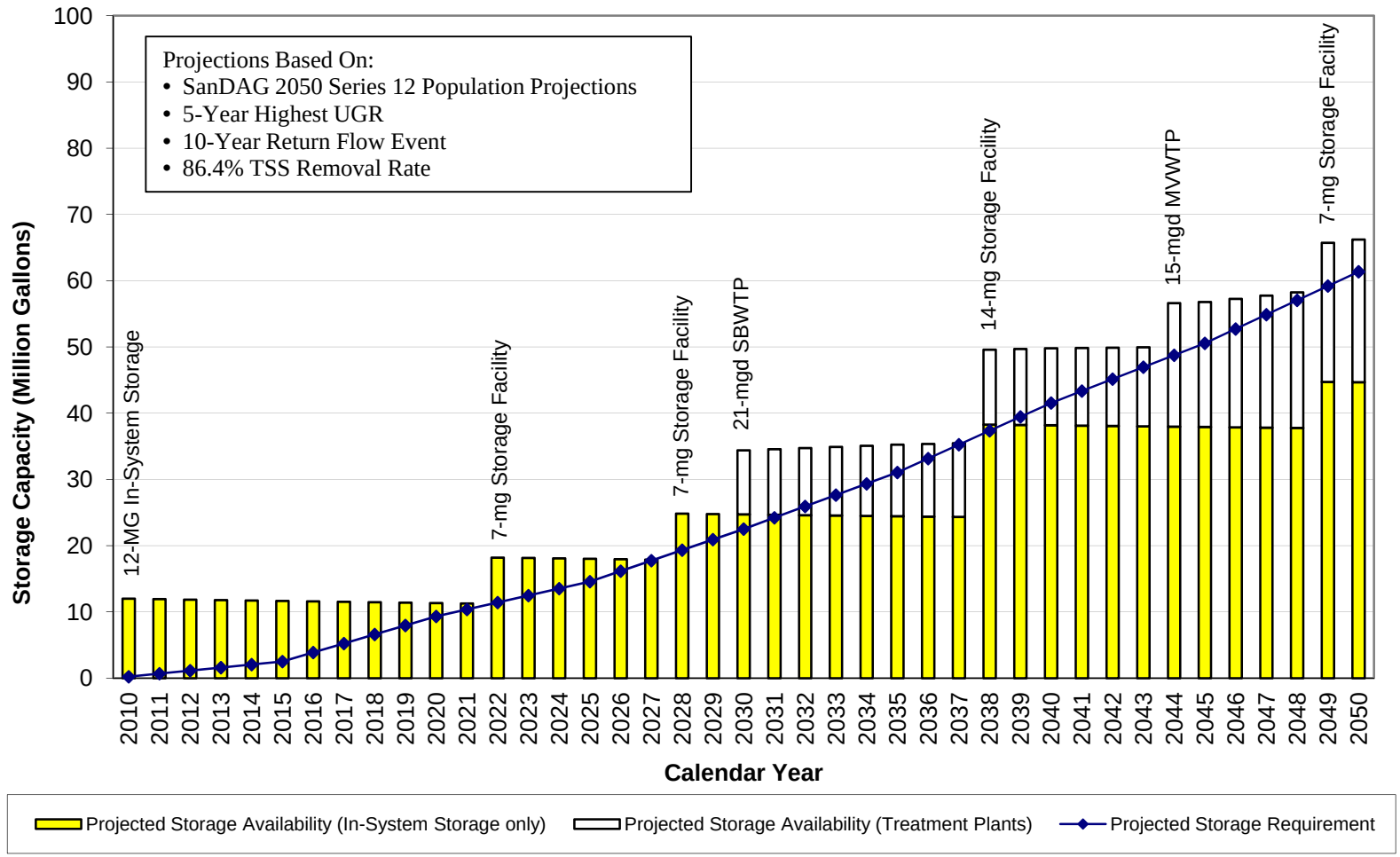
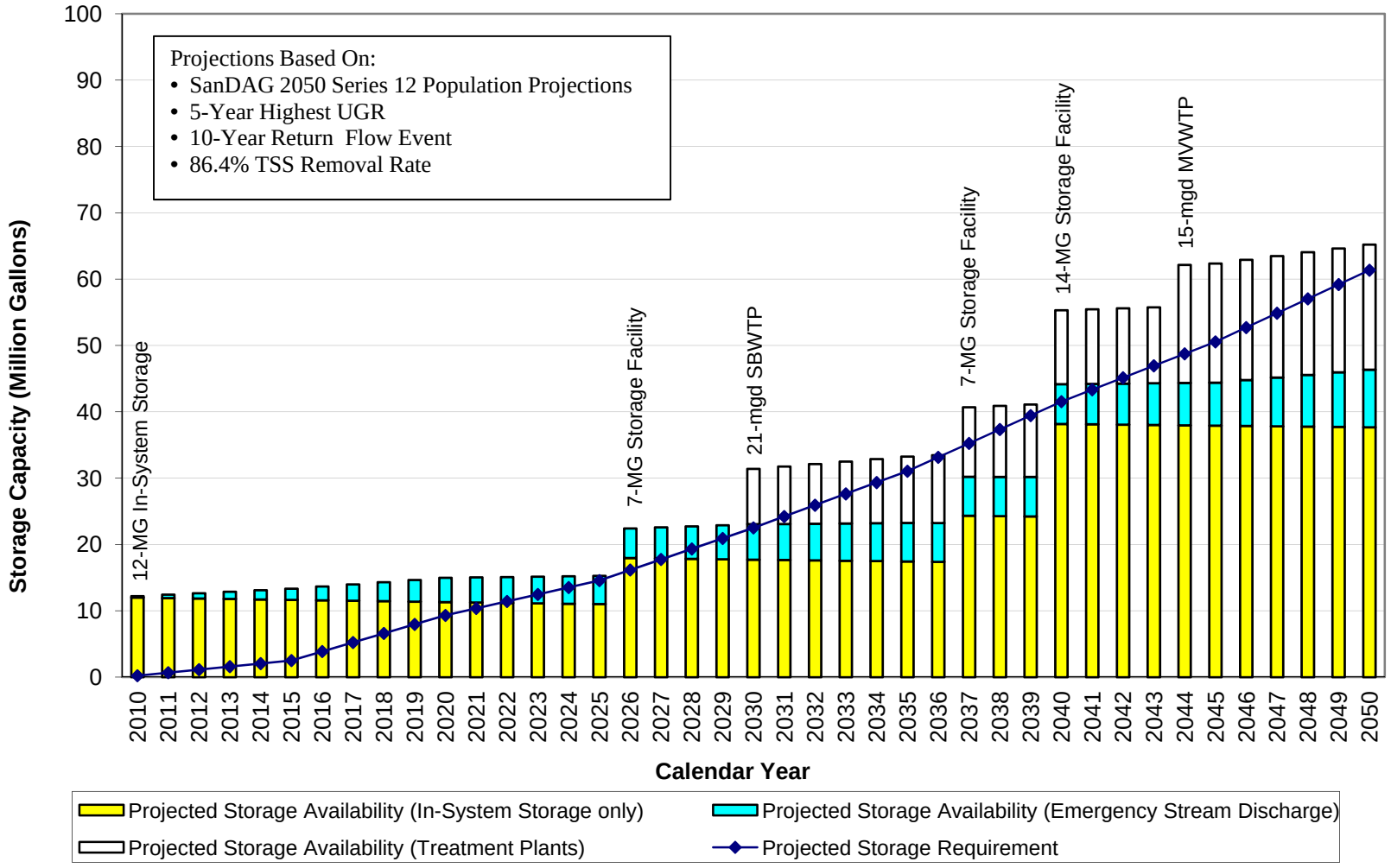


Figure 4-2

Wet Weather Storage Requirement
12 MG In-System Storage & 16 MGD Emergency Stream Discharge



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5.0 PROJECT PRIORITIZATION AND CIP DEVELOPMENT

This section describes the wastewater prioritization method and CIP development process. In addition, this section provides the method used to define the list of prioritized wastewater CIP projects and forecasted 20-year CIP.

5.1 Background

In 2009, the Water Branch of the Public Utilities Department developed the Water Facilities Master Plan (WFMP) to evaluate the system needs and define a CIP to be implemented for the next 20 years. The overall scope of work for the WFMP included a number of tasks. These tasks also included a project prioritization process to rank projects by importance and used the prioritized projects to develop the CIP. The Water prioritization process was an iterative process which required the participation of stakeholders and the Independent Rates Oversight Committee (IROC) in developing sub-criteria, sub-weight, project scoring, and ranking. The Council Policy 800-14 (Citywide CIP prioritization method) was used as the foundation for the prioritization method. In addition, the sub-criteria and sub-weights input provided by IROC was also incorporated into the prioritization method.

In 2010, the Wastewater Branch of the Public Utilities Department developed a method for prioritizing wastewater CIP projects. The Wastewater Branch adopted the established prioritization method used for the water projects with the modification of several sub-criteria to reflect the nature of wastewater CIP projects. The current method still uses the exact CP 800-14 criteria as the basis for prioritization. The process of developing the wastewater sub-criteria involved the participation of internal stakeholders (staff from EPM, Wastewater Collection, and Treatment and Disposal Divisions). The current wastewater sub-criteria did not deviate much from the established water's sub-criteria, because both shared common facilities such as treatment plants, pump stations, and pipelines. As for external stakeholders, since the majority of the sub-weights were based on the weights recommended by IROC for water prioritization, the dot-weighted exercise performed by IROC for water prioritization was not included in this process. The final wastewater CIP prioritization method preserved the majority of the IROC sub-criteria and sub-weights. For the ranking process, similar to water process, multiple meetings and workshops with project proponents were held to introduce the prioritization tools, indentify projects, score projects, and obtain consensus on ranking results.

The overall wastewater CIP prioritization method was presented to CIPRAC in November 2010. In addition, this process and the ranking results were presented to the Public Utilities' Senior Management Team (USET) and the Full IROC in December 2010.

Table 5-1 shows the difference between water and wastewater sub-criteria and sub-weights.

Table 5-1
Sub-criteria and Sub-weight Comparison

Water's Sub-Criteria	Wastewater
Provide Adequate Fire Flows (14%)	These two sub-criteria were replaced with ***"Reduce or Eliminate Potential Overflows"*** and the weights were consolidated to 28%
Eliminate Potential Supply Shortages to Customers (14%)	
Reduce Unaccounted for Water (40%)	This sub-criterion was replaced with "***Increases Longevity of Asset***" with the same weight.
Improve Water Quality to Meet Secondary Goals (non-regulated)-(8%)	This sub-criterion was removed because the "Meet Water Quality Standard" sub-criterion covered the regulated and non-regulated standards and the sub-weight of 8% was added to the sub-criterion "Reduce Environmental Impacts" to give a total of 35%

The Wastewater prioritization method and the ranking results are presented in Appendix C.

5.2 Project Cost Estimate Approach

CIP projects and their associated costs were provided by project proponents and also from individual facility master plans. These individual facility master plans assessed condition, operation, capacity and facility needs.

As for the project costs, the level of detail and accuracy for each facility cost estimate is dependent on the level (master planning, planning, design, and construction) of project development. Many of these proposed CIP projects are typically in the master planning level and the costs were developed using past related planning studies and opinions of probable costs for the planning purposes. The costs in this 2012 MWP were adjusted to 2012 ENR Los Angeles Construction Cost Index (CCI). Since the proposed CIP project phasing is unknown at this time, the total project cost will need to be refined to reflect the actual design and construction dates.

CIP DEVELOPMENT

Once the CIP projects are prioritized and approved by the USET, these CIP projects including the project costs are inputted into the City's scheduling tools (Primavera Scheduling Software Application, P6) to define the schedules for all CIP projects. A 5-year CIP forecasted project implementation and expenditure schedule was developed. The forecasted expenditures include on-going projects, annual allocations for various asset types, and the prioritized projects. The CIP is structured to follow the prioritization list.

The 5-year wastewater CIP by project category is presented in Appendix D.

The timing for implementing many of the prioritized projects in the CIP is based on the ranking. However, there are a number of projects in which the timing for implementation is fixed due to meeting regulatory requirements such as PLWTP TSS effluent discharge to the ocean, or due to meeting emergency needs. Although these projects are prioritized against other CIP projects based on their importance, which may result in low ranking, the implementation is dictated by the nature of the critical conditional needs.

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6.0 RECOMMENDATIONS

6.1 Wet Weather Storage Facility

Sewer conveyance systems and wastewater treatment facilities must be designed to handle peak wet weather flows corresponding to a design storm event. A design storm event is defined in terms of its probability of storm occurrence expressed in return period. PUD adopted the 10-year return period as a standard for sizing future facilities. Modeling of the existing Metropolitan Sewerage System identified capacity limitations at PS1 and PS2. As a remedy for these limitations, the PUD is proposing the construction of wet weather storage facilities (WWSFs) within proximity of PS2. The implementation of the WWSFs will occur over a span of 40 years. In addition, it will also be dictated by the regulatory approval of the City proposed 16 mgd emergency stream discharge (ESD) facilities.

Two options are presented below

- If the ESD is **NOT** permitted at NCWRP, three 7 MG WWSFs would be required by the years 2022, 2028, and 2049 and one 14 MG WWSF would be required until the year 2038. The estimated project cost for this alternative is approximately $511 million in 2012 dollars.
- If the ESD is permitted at NCWRP, Two 7 MG WWSF would be required until the years 2026 and 2037, while the 14 MG WWSF would be required until 2040. The estimated project cost for this alternative is approximately $419 million in 2012 dollars.

As these options indicate, if the ESD is permitted at NCWRP, the total number of WWSFs would be reduced from four to three and delay the required construction of the facilities. The recommendations for the proposed WWSFs assume that the PLWTP remains a CEPT facility.

6.2 South Bay Wastewater Treatment Plant

Based on hydraulic and MER modeling and with SBWRP remaining at 15 mgd capacity, the planned 21 mgd South Bay Wastewater Treatment Plant (SBWTP) does not have to be on-line until 2030. This facility will treat flows generated in the South Bay Area including Spring Valley and National City. The SBWTP will include a Southern Sludge Processing Facility. The estimated project cost for this facility is approximately $373 million in 2012 dollars.

6.3 South Bay Secondary Conveyance Systems

Conveyance facilities are required to deliver sewage flows to the planned South Bay Wastewater Treatment Plant. In addition to the Grove Avenue Pump Station (GAPS), and the Otay River Pump Station (ORPS), under the 2012 MWP, the South Bay Secondary Conveyance System (SBSCS) will need to be on-line by 2030. This facility will consist of a 21 mgd South Bay Pump

Station and a 103 mgd (peak) pipeline that is designed to carry build-out flows. The estimated project cost for this facility is approximately $189 million in 2012 dollars.

6.4 Mission Valley Wastewater Treatment Plant

With the SBWTP and its supporting conveyance system online by 2030 and required Wet Weather Storage Facilities, the Mission Valley Wastewater Treatment Plant (MVWTP) will not be required until 2044. This plant will handle flows generated within the central region of San Diego. In addition to the MVWTP, several facilities listed in subsections 5.5, 5.6 and 5.7 would be required to be online by or before 2044. It is important to mention that all wastewater facilities proposed in this 2012 MWP will be constructed as secondary treatment facilities. The conversion of these facilities from secondary to Title 22 water reclamation facilities will be determined based on future water supply planning. The estimated project cost for this facility is approximately $237 million in 2012 dollars.

6.5 Mission Valley Effluent Pipeline

The Mission Valley Effluent Pipeline will be needed by 2044 to convey flows from the MVWTP to the Point Loma Tunnel Outfall. The estimated project cost for this facility is approximately $59 million in 2012 dollars.

6.6 Mission Valley Sludge Pipeline

The Mission Valley Sludge Pipeline will be needed by the year 2044. The main purpose of this line is to convey sludge from the MVWTP to the Metropolitan Biosolids Center. The estimated project cost for this facility is approximately $28 million in 2012 dollars.

6.7 Point Loma Tunnel Outfall

This facility will be needed by 2044 and it will mainly function to handle discharge from the MVWTP and the NCWRP (after construction of EMBP and NCEP). This outfall will provide a fail-safe disposal of NCWRP and/or MVWTP effluent and also provide hydraulic relief to the Metro System. The estimated project cost for this facility is approximately $361 million in 2012 dollars.

6.8 North City Water Reclamation Plant Phase II

Based on recently conducted hydraulic and MER models, this facility, which involves expansion of its secondary treatment capacity from 30 to 40 mgd, will not need to be on-line within the planning horizon of this plan. This is mainly due to insufficient projected wastewater flows generated in the North City Basin. As with the MVWTP, this Phase II expansion will only be utilized as a secondary treatment facility.

6.9 North City Effluent Pipeline (NCEP)

This facility will be needed to convey effluent flow from the NCWRP plant to the third Rose Canyon Trunk Sewer (to be converted to effluent pipeline), which then conveys the flow to the East Mission Bay Pipeline, then to the Point Loma Tunnel Outfall and finally to the Point Loma Ocean Outfall. This pipeline would not have to be online within the planning horizon of this plan.

6.10 East Mission Bay Effluent Pipeline (EMBP)

This pipeline will serve as a connection between the Third Rose Canyon Trunk Sewer and the Point Loma Tunnel Outfall. This pipeline, as with the NCEP, will not be operable as an effluent pipeline for NCWRP within the planning horizon of this plan.

6.11 Metropolitan Biosolids Center (MBC) Modifications

The modifications to the Metro System presented in this plan are to be implemented in response to expected additional flows and loads to the MBC facility. To handle these additional flows and loads, several components of the MBC facility would need to be upgraded or replaced.

6.12 Point Loma Wastewater Treatment Plant Upgrades

The Point Loma Wastewater Treatment Plant has been in operation since the 1960s. This facility will require occasional maintenance and upgrades as equipment and structures reach the end of their useful life. It is important to mention that this facility has seen several major upgrades since it was brought online. Most of the upgrades were done in the 1990s under the Clean Water Program and included the outfall extension, new sedimentation basins, new digesters, an operations building, an odor control facility, and an onsite power generating facility. However, it is expected that an additional digester would be required to serve as a standby when one of the existing digesters is under rehabilitation/replacement. As the condition of the existing structures and equipment are continually being evaluated, the timing and need for new facilities (including digesters) will be periodically re-examined.

6.13 Point Loma Parallel Ocean Outfall

The existing ocean outfall has been in operation since the inception of the plant back in the 1960s. In 1993, the Outfall was extended from a length of two miles off the coast of Point Loma to its present length of 4.5 miles. The existing Outfall is inspected externally every year. Internal inspections of the first 2,100 ft occur every six years. Inspections reveal the pipe to be in good condition. However, it is expected that this pipe will reach its useful life in the future. Therefore, the need for the Point Loma Parallel Outfall will be evaluated every six years as the condition of the existing outfall is assessed.

6.14 Existing Facilities

In addition to the proposed Metro facilities listed above, additional upgrades to existing Metro facilities will be needed. These upgrades are addressed in each facility's master plan. It is estimated that the current and future improvements for the Metropolitan Biosolids Center (MBC) expenditures will be approximately $61 million (2012 dollars). Estimates for current and future upgrades at the North City Water Reclamation Plant (NCWRP) are around $13 million (2012 dollars). The lists of projects at the MBC and NCWRP are shown in Appendix E.

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7.0 FUTURE METROPOLITAN WASTEWATER PLAN (MWP) UPDATE

7.1 Driving Forces Affecting the MWP

As previously stated, the MWP is periodically updated to incorporate factors such as the latest information on population growth and wastewater flows, load trends within the Metro Service Area, regulations imposed by federal and state agencies, the markets for reclaimed water, and various local issues important to the City and the participating agencies served by Metro. It is expected that an update for the MWP will be issued every five years or one year after the approval of PLWTP National Pollution Discharge Elimination System (NPDES) permit.

7.2 Related Studies

In the 1990s, the Clean Water Program evaluated methods to provide secondary treatment at the PLWTP using conventional treatment processes. Upgrading the level of treatment at this facility was particularly challenging because of the limited space available at the site. The facility is currently permitted for an average flow of 240 mgd. The evaluation concluded that utilizing the traditional secondary process of oxygen activated sludge treatment would result in only 150 mgd capacity. The additional 90 mgd would have to be constructed at other locations.

In 2005, the City evaluated a more cost effective secondary treatment alternative and pilot tested the Biological Aerated Filtration (BAF) system. This system performed extremely well and occupies a smaller footprint compared to a traditional process. The test results concluded that BAF indicated no degradation of effluent quality at simulated storm flow loadings, consistently meeting secondary effluent standards. The pilot tests were successful and established that BAF is a workable alternative for the PLWTP. The cost of implementing a full scale BAF process at the PLWTP is estimated at $1.4 billion without Navy land in 2012 dollars. Although the technology is new to the City, hundreds of BAF plants have been constructed and successfully operated in the United States and worldwide in the past decades.

Currently, a number of studies have been proposed to off load flow from the PLWTP and have identified opportunities within the City's system to maximize recycling and reclamation of wastewater for potable and non-potable uses. These related studies include the Indirect Potable Reuse (IPR) Demonstration and Recycled Water Study (RWS). The RWS evaluates a number of cost effective alternatives for IPR satellite facilities and the PLWTP conversion to secondary treatment. Upon completion of the RWS and the final decision on approved alternative(s) and implementation plan, the MWP will evaluate RWS alternative(s) in terms of impact on the Metro Sewage System.

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Appendices

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APPENDIX A:

2003 Metropolitan Wastewater Plan

Proposed Metro Facilities

2003 Metropolitan Wastewater Plan

Proposed Metro Facilities

FACILITY	PROPOSED CAPACITY	ONLINE BY
Wet Weather Storage Facility Phase 1	7 MG	2011
Wet Weather Storage Facility Phase 2	14MG	2014
South Bay Wastewater Treatment Plant Phase I	21 mgd(4)	2018
South Bay Pump Station Phase I	21 mgd(1)	2018
South Bay Conveyance System Phase I	103 mgd(1)	2018
Wet Weather Storage Facility Phase 3	14 MG	2025
Point Loma Tunnel Outfall	162 mgd(1)	2030
Mission Valley Wastewater Treatment Plant	15 mgd(2)	2030
Mission Valley Effluent Pipeline	24 mgd	2030
Mission Valley Sludge Pipeline	2.11 mgd	2030
North City Water Reclamation Plant Phase II	10 mgd(2)	2033
East Mission Bay Pipeline	90 mgd(2)	2033
North City Effluent Pipeline	90 mgd(2)	2033
Point Loma Parallel Outfall		TBD(3)

(1) Pump Stations and Pipelines are designed to carry build-out peak wet weather flows.

(2) This facility will be built as a secondary treatment plant with the option to upgrade to water reclamation plant.

(3) The need for this facility will be revisited every 5 years as the inspection of the existing Point Loma Outfall is being conducted.

(4) The South Bay Secondary Treatment Facility will include a Southern Biosolids Processing Facility.

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APPENDIX B:

2012 MWP FLOW PROJECTION METHOD

The 2012 MWP flow projection method consists of the following six steps:

1. **Applying PLWTP Flow Data:** Point Loma Wastewater Treatment Plant (PLWTP) treats the wastewater generated from the entire Metro System excluding the areas served by the South Bay Water Reclamation Plant (SBWRP). The daily influent flows of the plant are measured by the flow monitors at the PLWTP.

2. **Determining Current System-Generated Annual Average Daily Flows:** The system-generated flows, generated from residential and commercial/industrial populations within the Metro System, were calculated from the PLWTP influents by subtracting the effluents and adding the influents of all upstream treatment facilities. For instance, in order to obtain the system-generated flow, the influent of the SBWRP was added to the PLWTP influent, while the sludge returned from the SBWRP was subtracted. All wastewater treatment facilities located in the Metro System are taken into account in this process. In addition, the system-generated flows exclude population-independent flows, such as inflows/infiltrations (I/I), major industrial discharges, Tijuana flows, etc.

   Using SANDAG 2050 Projections: SANDAG, as the regional planning agency, projected the residential populations and industrial/commercial employments at a five-year increment from 2000 to the build out year, i.e., 2000, 2005, and 2010 to 2050. PUD obtained the projection information from SANDAG in the GIS format, and was able to integrate and/or segregate the data for various service areas.

3. **Calculating Flow UGRs:** The population-based UGR and the employment-based UGR were calculated by dividing the system-generated flow of the current year by the current residential population and industrial/commercial population within the Metro system. Additional data, such as industrial/commercial flows and water consumptions, were also used in this process.

4. **Projecting Annual Average Dry Weather Flows:** Applying the residential and industrial/commercial population projections obtained in Step 3 and the UGRs obtained in Step 4, one can project the dry weather flows for the future years. To ensure the level of conservativeness and consistency required in the long term facility planning, the highest UGR values assessed in the most recent five years were applied in projecting the dry weather flows. The population-independent flows were then estimated and added to the dry weather flows, as shown in the next step.

5. **Projecting Annual Average Daily Flow (AADF):** Since the wet weather flow varies considerably from year to year, projections of AADF were developed by considering the wet weather components of a relatively wet year. Calibrated against flow data recorded at the Pump Station 2, including significant wet weather components that occurred in 1993, 1995, and 1998, a hydrological model was established to simulate different wet weather flows based on 62 years of historical rainfall events. Further statistical analysis conducted based on the hydrological model outputs quantified the wet weather components according to the probability of event reoccurrence, e.g., 2-year and 10-year return periods. The 10-year return wet weather flow represents the magnitude of wet weather flow that may occur every ten years. The wet weather flow with this magnitude or higher has a 10-percent probability to occur in any given year; it represents a relatively conservative value and therefore is used for the long term facility planning purpose. In this step, the ratio of 10-year return flow to the dry weather flow was determined to be 9.6 percent and applied to the dry weather flow projection obtained in Step 5 to yield the projections of AADF.

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APPENDIX C:

Wastewater Prioritization Method and the Ranking Results

City of San Diego
Public Utilities Department

CIP Prioritization Method
(Wastewater)

COUNCIL POLICY (CP 800-14)

CIP PRIORITIZATION METHOD

CURRENT

CITY OF SAN DIEGO, CALIFORNIA

COUNCIL POLICY

SUBJECT: PRIORITIZING CIP PROJECTS
POLICY NO: 800-14
EFFECTIVE DATE: May 30, 2008

BACKGROUND:

The City of San Diego's Capital Improvement Program (CIP) is implemented through an interrelationship of client departments, service departments, new and redevelopment, and multiple funding sources. Capital investments are necessary for the construction of all parts of municipal infrastructure. Major infrastructure within the City's area of responsibility includes streets and related right-of-way features; storm water and drainage systems; water and sewer systems; public buildings such as libraries, recreational and community centers, police and fire stations, and lifeguard facilities; and parks. Decisions about capital investments affect the availability and quality of most government services. The municipal infrastructure is often taken for granted, yet it is vital to the city's economy, with implications for health, safety, and quality of life.

The commitment of resources to the CIP projects within the City has traditionally not had the benefit of a comprehensive evaluation to determine overall needs so that projects can be ranked in priority order, and efficiently funded. This approach may have unintentionally limited the overall effectiveness of available CIP resources by providing projects with less funding than ~~is~~ needed to accomplish major project requirements, such as planning and design. This has limited the City's ability to compete for outside grant funding, since grant programs often place emphasis on having the design and associated activities completed.

PURPOSE:

The purpose of this policy is to establish an objective process for ranking CIP projects to allow decision-makers to have a basis for choosing the most compelling projects for implementation. This prioritization process will allows for the analytical comparison of the costs and benefits of individual projects, as well as an opportunity to evaluate projects against one another on their relative merits. Ideally, it will provide a citywide perspective, explore various financing options, and facilitate project coordination. All projects being considered for funding will be prioritized in accordance with the guidelines of this policy. It is proposed that this single CIP prioritization policy address all funding sources and asset classes, including enterprise funded projects (golf, water, sewer, airport facilities, undergrounding and landfill) and transportation and drainage projects. The goal of this policy is to establish a capital-planning process that ultimately leads to policy decisions that optimize the use of available resources, resulting in the maximum benefit from the projects delivered.

IMPLEMENTATION:

In order to implement a prioritization system, there must be an understanding of the constraints associated with each project's funding source(s), asset type (project category), or phase of development. Projects will not compete across the different funding sources, the different project categories, or the different project phases – however projects within each of these areas will be evaluated according to the guidelines outlined below.

A. Project Funding

Projects within restricted funding categories will compete only with projects within the same funding category. Prioritization within these restricted funding categories will occur in accordance with this CIP prioritization policy. For example, water system CIP projects are funded with enterprise funds paid by water ratepayers. All water CIP projects will be prioritized in accordance with the prioritization policy, but will not compete for funding with projects not funded by Water Enterprise funds.

The following is a partial listing of restricted funding categories:

1. Community Development Block Grants
2. Developer Impact Fees
3. Enterprise Funds (Airport, Environmental Services, Golf, Utilities Undergrounding, Metropolitan Wastewater, and Water)
4. Facilities Benefit Assessments
5. Grants
6. State and Federal Funds
7. TransNet Funds

Projects that are not within a restricted funding category will compete within capital outlay funds/general obligation funds in accordance with this CIP prioritization policy. Although capital needs from the restricted funds or revenue-producing departments are often separate from the General Fund, the capital investments of all City departments should be planned together to allow better coordination of capital projects in specific parts of the City over time. Citywide coordination of capital project planning can increase the cost-effectiveness of the City's capital programs by allowing more efficient infrastructure investments.

B. Project Categories

To ensure that the comparison is conducted between similar types of projects, the CIP projects shall be separated into categories according to the predominant type of asset in the project. Project categories shall include the below alphabetically listed asset types:

- **Airport Assets**
- **Buildings** - Facilities and structures, with the following project subcategories:
  - Community support facilities and structures
  - Fire facilities and structures
  - Libraries
  - Metropolitan Wastewater department facilities and structures (e.g., treatment plants - and pump stations)
  - Operations facilities and structures (e.g., maintenance shops and offices)
  - Other City facilities and structures
  - Park & Recreation facilities and structures
  - Police facilities and structures
  - Water department facilities and structures (e.g., treatment plants, pump stations, reservoirs, dams, standpipes)
- **Drainage** - Storm drain systems including pipes, channels, Best Management Practices (BMPs) and pump stations
- **Flood Control Systems**
- **Golf Courses**
- **Landfills** - Landfills and supporting facilities and structures
- **Parks** - Parks and open space
- **Reclaimed Water System**
- **Transportation** - Transportation facilities, with the following project subcategories:
  - Bicycle Facilities (all classifications).
  - Bridge Replacement, Retrofit, and Rehabilitation.
  - Erosion control, slope stabilization, and retaining walls supporting transportation facilities.
  - Guardrails, Barrier Rails, and other structural safety enhancements.
  - New Roads, Roadway Widening, and Roadway Reconfigurations.
  - Street Enhancements including medians and streetscape.
  - New Traffic Signals.
  - Pedestrian Accessibility Improvements including curb ramps.
  - Pedestrian Facilities including sidewalks but not curb ramps.
  - Street Lighting including mid-block and intersection safety locations.
  - Traffic Calming, Flashing Beacons, and other speed abatement work.
  - Traffic Signal Interconnections and other signal coordination work.
  - Traffic Signal Upgrades and Modifications..

- **Wastewater** - Wastewater collection systems
- **Water** - Water distribution systems

CIP budgets shall reflect project allocations according to these categories. These project categories shall include resource allocation for all project components, including environmental mitigation, property acquisition, and all other activities necessary to complete the project.

C. Project Phases

To ensure that the prioritization is conducted between projects with a similar level of completion, all CIP projects shall be separated into the following standard phases of project development within each project category:

1. Planning –includes development of a feasibility study, detailed scope, and budget.
2. Design - includes development of the environmental document, construction plans and specifications, and detailed cost estimate.
3. Construction - includes site preparation, utilities placement, equipment installation, construction, and environmental mitigation.

To initiate an effective capital project process, a revolving fund will be established for capital planning, to allow improved development of the scope, feasibility and funding requirements of projects prior to them becoming a CIP. The implementation of a capital planning process will result in better information, planning, and analysis of proposed capital projects. A goal of 5% is established as the minimum of CIP resources allocated to projects in the Planning phase.

D. Prioritization Factors

The City must prioritize capital needs to assist in the determination of which projects will receive available funding and resources, and/or compete for bond funding based on criteria that is aligned with Departmental priorities, the Mayor's long-term plans, and City Council's objectives.

For all non-transportation projects (See Section B. Project Categories), the following are the prioritization factors (listed in order of importance):

1. **Health & Safety Effects:** This criterion will include an assessment of the degree to which the project improves health and safety factors associated with the infrastructure asset. For example, projects that result in the reduction in accidents, improved structural integrity, and mitigation of health hazards would score higher. The evaluation of this criterion will constitute twenty-five percent (25%) of the project's total score.

2. **Regulatory or mandated requirements:** This criterion will include an assessment of the degree to which the project is under a regulatory order or other legal mandates. For example, projects that are required by consent decrees, court orders, and other legal mandates would score higher. The evaluation of this criterion will constitute twenty-five percent (25%) of the project's total score.

3. **Implication of Deferring the Project:** This criterion will include an assessment of the consequences of delaying a project. For example, projects that would have significantly higher future costs, negative community impacts, or negative public perception, should they be deferred, would score higher. The evaluation of this criterion will constitute fifteen percent (15%) of the project's total score.

4. **Annual recurring cost or increased longevity of the capital asset:** This criterion will include an assessment of the degree to which the project reduces operations and maintenance expenditures by the City. For example, a roof replacement project that reduces both maintenance requirements and energy consumption or a storm drain replacement project that reduces the need for periodic cleaning would score higher. On the other hand, a new library that increases maintenance, energy and staffing costs would score lower. The evaluation of this criterion will constitute ten percent (10%) of the project's total score.

5. **Community Investment:** This criterion will include an assessment of the degree to which the project contributes toward economic development and revitalization efforts. For example, a project within an approved Redevelopment Area or Community Development Block Grant eligible area would score higher. The evaluation of this criterion will constitute ten percent (10%) of the project's total score.

6. **Implementation:** This criterion will include an assessment of the degree to which the project is in compliance with the General Plan, Community Plan, or approved City-wide master plan. An assessment of other issues involved in completing the project (e.g., significant environmental issues, project complexity, and level of public support) will also be included in this criterion. For example, projects that would benefit the City of Villages Strategy, further smart growth, or receive overwhelming support from the community would score higher, while projects that would significantly impact the environment and trigger high mitigation requirements would score lower. The evaluation of this criterion will constitute five percent (5%) of the project's total score.

7. **Project Cost and Grant Funding Opportunity:** This criterion will include an assessment of the amount of funding needed to complete the current project phase and the entire project, and shall also include assessment of the amount of City funding in the project compared to the amount of funding provided by grant funds from outside agencies. For example, a project that would bring grant funds from an outside agency into the City would score higher, while a project that relies only on City funds would score lower. The evaluation of this criterion will constitute five percent (5%) of the project's total score.

8. **Project Readiness:** This criterion will include an assessment of the time required for a project to complete its current project phase (i.e., planning, design or construction). For example, a project with a completed environmental document or community outreach would score higher, while a highly complex project requiring longer design time would score lower. The evaluation of this criterion will constitute five percent (5%) of the project's total score.

For transportation projects (See Section B. Project Categories), the following key prioritization factors will be used in lieu of the above factors:

1. **Health & Safety:** This criterion shall include an assessment of the degree to which the project improves the safety of the public using the facility. This criterion also includes an assessment of the degree that a project is under a regulatory order or other legal mandates relating to public safety. For example, projects that result in reduction in traffic accidents, improved seismic safety rating of a bridge, upgrade of an undersized storm drain to address flooding problems, and reduction of response times by emergency vehicles would score higher. The evaluation of this criterion will constitute twenty-five percent (25%) of the project's total score.

2 **Capacity & Service (Mobility):** This criterion shall include an assessment of the degree to which the project improves the ability of the transportation system to move people under all modes of travel including vehicle, transit, bicycle, and pedestrian usage. This criterion will also include an assessment of the degree to which the project improves the overall connectivity and reliability of the City's transportation system. For example, projects that reconfigure intersections to reduce delays, improve a parallel road to bypass a congested intersection, and interconnect traffic signals to reduce travel time along a congested corridor would score higher. The evaluation results of this criterion shall constitute twenty percent (20%) of a project's total score.

3. **Project Cost and Grant Funding Opportunity:** This criterion shall include an assessment of the amount of funding needed to complete the current project phase and the entire project, and hall also include assessment of the amount of City funding in the project compared to the amount of funding provided by grant funds from outside agencies. For example, a project that would bring grant funds from an outside agency into the City would score higher, while a project that relies only on City funds would score lower. The evaluation of this criterion shall constitute twenty percent (20%) of the project's total score.

4. **Revitalization, Community Support & Community Plan Compliance:** This criterion shall include an assessment of the degree to which the project is in compliance with the General Plan, Community Plan, Regional Transportation Plan, or an approved City-wide master plan. This criterion shall also include an assessment of the degree to which the project is officially supported by the Community Planning Group(s), the Councilmember(s), or a Regional Agency (such as SANDAG). This criterion shall also include an assessment of the degree to which the project contributes towards economic development and revitalization efforts. For example, projects that benefits a pilot village in the City of Villages strategy or furthers smart growth, implements a portion of the City-wide master plan or corridor study, has overwhelming and documented support from the community, implements a portion of an approved Redevelopment Area infrastructure plan, and provides transportation facilities for a Community Development Block Grant eligible area would score higher. The evaluation results of this criterion shall constitute fifteen percent (15%) of a project's total score.

5. **Multiple Category Benefit:** This criterion shall include an assessment of the degree to which the project provides highly rated facilities for multiple project categories (see Section B for project categories). For example, a roadway project that also provides for the replacement of a deteriorated storm drain, a streetscape project that also provides street lighting at critical intersections, and a bikeway project that provides slope stabilization at an area of known erosion problems would score higher. The evaluation of this criterion shall constitute ten percent (10%) of the project's total score.

6. **Annual recurring cost or increased longevity of the capital asset:** This criterion shall include an assessment of the degree to which the project reduces operations and maintenance expenditures by the City. For example, a roadway widening project that replaces an area of pavement in poor condition or that installs a highly rated traffic signal would score higher, while a project with equipment that requires frequent maintenance would score lower. The evaluation results of this criterion shall constitute five percent (5%) of a project's total score.

7. **Project Readiness:** This criterion shall include an assessment of the time required for a project to complete its current project phase (i.e., planning, design or construction). For example, a project with a completed environmental document or community outreach would score higher, while a highly complex project requiring longer design time or significant environmental mitigation would score lower. The evaluation results of this criterion shall constitute five percent (5%) of a project's total score.

E. Implementation Process

1. Using the project categories (funding & project), phases, and criteria, the Mayor shall develop a prioritization score for each CIP project. The Mayor shall then rank all CIP projects within their respective categories (funding & project) and phases according to their project score. In case of ties, the Mayor shall evaluate the overall infrastructure deficiency within the communities for each project as the deciding factor.
2. The resultant ranking list for each category and phase of CIP projects shall be reported by the Mayor to the Council as part of the annual CIP budget, with recommendations for funding.
3. Upon approval of the CIP budget by the Council, the Mayor shall pursue the completion of each project phase according to the priority ranking resulting from this prioritization process up to the total amounts authorized by Council for each project category. The Mayor shall also utilize the resultant priority ranking for the pursuit of all outside grant funding opportunities.
4. The Mayor will update the priority score as the conditions of each project change or other new information becomes available. For instance, if grant funding becomes available for a lower ranked project, the priority score would be re-evaluated with this new information. When changes occur that would alter a project's priority ranking, the priority list will be revised. The City Council will receive an informational brief of changes to the priority list at mid-year, and the annual update of the list will be part of the budget process. . Similarly, resources shall not be withdrawn from a project prior to the completion of its current phase, unless reallocation is authorized by the annual appropriation ordinance or approved by Council.
5. Implementation of this Council Policy is not intended to release or alter the City's current or future obligations to complete specific CIP projects by specified deadlines, as may be imposed by court order, or order of any federal, state or local regulatory agency.

HISTORY:
Adopted by Resolution R-302291 on 01/16/2007
Amended by Resolution R-303741 on 05/30/2008

CIP PRIORITIZATION METHOD (WASTEWATER)

Public Utilities Department
Wastewater Facilities
Capital Improvement Program (CIP) Prioritization Criteria and Weights

Criteria	Sub-criteria	Sub-Weight (%)
Health and Safety Effects (25%)	Reduce Potential Hazards to Customers and Employees	12
	Maintain Structural Integrity of Facilities	12
	Reduce Seismic Risk	12
	Reduce or Eliminate Potential Overflows	28
	Minimize the Amount and Duration of Service Interruptions to Customers	19
	Meet Water Quality Standards	13
	Reduce Potential Impacts to Public and Private Property	4
Regulatory or Mandated Requirements (25%)	Comply with Regulatory Requirements	39
	Comply with City Council Mandates	18
	Comply with Court-Ordered Mandates	28
	Comply with City's System Performance Criteria	15
Implication of Deferring the Project (15%)	Reduce Impacts on Other Projects	19
	Reduce O&M Costs in the Long-Term (Beyond four years) with Project Implementation	32
	Reduce or Eliminate Fines Due to Violations of Permits and Non-Compliance with Regulations	18
	Unplanned Expenses Due to Repairs and Emergencies that Could be Avoided by Implementing Project	32
Annual Recurring Costs or Increased Longevity of Assets (10%)	Increases Longevity of Asset	40
	Reduce Annual Recurring O&M Costs in the Short-Term by Implementing Project	60
Community Investment (10%)	Minimize Loss of Economic Activity Due to Facilities Failure	40
	Reduce Environmental Impacts	35
	Make Efficient Use of Natural Resources	13
	Direct Benefits to the Community	11
Implementation (5%)	Agreement with General Plan and Community Plans	100
Project Cost and Grant Opportunities (5%)	Potential Grants/Loans	54
	Capital Costs	46
Project Readiness (5%)	Time Required for Project to Complete its Current Phase	100

Public Utilities Department
Wastewater Facilities
CIP Prioritization Criteria Scales

Criteria	*Sub-criteria*	*Sub-Weight*	*Scale*	*Scale*	*Better*	*Better*	*Better*	*Best Score in Scale*
Health and Safety Effects (25%)	Reduce Potential Hazards to Customers and Employees	12%	1 - 5	1 = There is no element of the project that removes a hazard. Structural or seismic related hazards are not counted since they are part of separate criteria.	NA	3 = Removes Hazards with Consequences within Site. Structural or seismic related hazards are not counted since they are part of separate criteria.	NA	5 = Removes Hazards with Consequences In Large Area. Structural or seismic related hazards are not counted since they are part of separate criteria.
	Eliminate structural integrity problems	12%	1 - 5	1 = No Structural Integrity Improvements. Counted structural elements that could represent a health hazard.	NA	NA	NA	5 = Structural Integrity Improvements. Counted structural elements that could represent a health hazard (eg. pump station and wwtp structures, and large diameter pipelines).
	Reduce Seismic Risk	12%	1 - 5	1 = No Seismic Improvements. Non-seismic related structural improvements are not counted since they are counted in a separate criterion.	NA	NA	NA	5 = Seismic Improvements. Non-seismic related structural improvements are not counted since they are counted in a separate criterion.
	Reduce or Eliminate Potential Overflows	28%	(See Matrix)	See Matrix	See Matrix	See Matrix	See Matrix	See Matrix
	Minimize the Amount and Duration of Service Interruptions to Customers	19%	(See Matrix)	See Matrix	See Matrix	See Matrix	See Matrix	See Matrix
	Meet Water Quality Standards	13%	1 - 5	1 = Doesn't Help Meet Standards	NA	3=Helps meets standards for receiving water bodies, or has some improvements to water quality related to constituents.	NA	5 = Helps Meet Standards by addressing a specific pollutant or improving treatment processes.
	Reduce Potential Impacts to Public and Private Property	4%	(See Matrix)	See Matrix	See Matrix	See Matrix	See Matrix	See Matrix
Regulatory or Mandated Requirements (25%)	Comply with Regulatory Requirements	39%	1 - 5	1 = Not Mandated or not directly addressing a mandate. The mandate needs to be not related to meeting water standards since that is addressed in a separate criterion.	NA	3=Mandated, Meet EPA regulatory requirement. Projects with regulatory requirements but not specifically mandated	NA	5 = Mandated,eg. Meet EPA, RWQCB deadline (eg. sewer group jobs)
	Comply with City Council Mandates	18%	1 - 5	1 = Not Mandated	NA	3 = Projects comply with Council Policies (such relocate sewer facilities out of canyon)	NA	5 = Mandated, Projects mandated by Council.
	Comply with Court-Ordered Mandates	28%	1 - 5	1 = Not Mandated	NA	NA	NA	5 = Yes
	Comply with System Performance Criteria	15%	1 - 5	1 =No,Project does not help meet any of the performance criteria	NA	3= Yes,Project helps meet 1 performance criteria	NA	5 = Yes, Project helps meet more than 1 performance criteria

Criteria	*Sub-criteria*	*Sub-Weight*	*Scale*	*Scale*	*Better*	*Better*	*Better*	*Best Score in Scale*
Implication of Deferring the Project (15%)	Reduce Impacts on Other Projects	19%	1 - 5	1 = No Impacts	2=Impacts to other projects/facilities in the long-term (needed after 5-10 yrs)	3= Projects that support optimal usage of existing facilities or other projects at present or in the near future	4=Projects needed to implement other projects in the short term (Parent to 1 project)	5=Projects needed to implement more than one project in the short term (Parent to more than 1 project)
	Reduce O&M Costs in the Long-Term (Beyond four years) with Project Implementation	32%	1 - 5	1 = Possible or known Increase	2 = No reduction or some reduction, but difficult to quantify (savings could be offset by additional O&M costs)	3 = Some Reduction in small scale (small facility or minimum reductions or partnering, sold unused realstate for revenue.	4 = O&M long-term savings is clearly evident (due to nature of project or if project objective is primarily long term O&M savings), but facility is small.	5 = Significant O&M long-term savings is clearly evident (due to nature of project or if project objective is primarily long term O&M savings).
	Reduce or Eliminate Fines Due to Violations of Permits and Non-Compliance with Regulations	18%	1 - 5	1 = No Fines Involved	NA	3 = Potential for fines	NA	5 = Fines Involved
	Unplanned Expenses Due to Repairs and Emergencies that Could be Avoided by Implementing Project	32%	(See Matrix)	See Matrix	See Matrix	See Matrix	See Matrix	See Matrix
Annual Recurring Costs or Increased Longevity of Assets (10%)	Increases Longevity of Asset	40%	1 - 5	1 = No additional longevity	NA	3=Minor increase in longevity	NA	5 = Significant increase in longevity
	Reduce Annual Recurring O&M Costs by Implementing Project	60%	1 - 5	1 = No additional costs being incurred; Improve Equipment Efficiency/System Efficiency/Inflow & Infiltration	NA	3=Minor costs incurred; Improve Equipment Efficiency/System Efficiency/Inflow & Infiltration	NA	5 = Significant additional costs being incurred; Improve Equipment Efficiency/System Efficiency/Inflow & Infiltration
Community Investment (10%)	Minimize Loss of Economic Activity Due to Facilities Failure	40%	(See Matrix)	See Matrix	See Matrix	See Matrix	See Matrix	See Matrix
	Reduce Environmental Impacts	35%	1 - 5	1 = Signifficant negative Impacts	2=Some negative impacts either locally or regionally	3 = Neutral or net zero impacts	4 = positive impacts locally or regionally	5 = Positive impacts locally and regionally
	Make Efficient Use of Natural Resources	13%	1 - 5	1 = Negative impacts on resource consumption	NA	3 = Neutral	4 = Slightly promotes efficient use of resources	5 = Significantly promotes efficient use of resources
	Direct Benefits to the Community	11%	1 - 5	1 = Negative Impacts on the Community	NA	3 = No impacts	NA	5 = Positive impacts to community such as providing the community with new liesure center or includes removal of an unnecesary structure (PS abandonment will improve the site by reducing noise, odor, vadalism or improve landscape).
Implementation (5%)	Agreement with General Plan and Community Plans	100%	1 - 5	1 = Not in Agreement	NA	NA	NA	5 = In Agreement
Project Cost and Grant Opportunities (5%)	Potential Grants/Loans	54%	1 - 5	1 = No Potential Grants/Loans	NA	3 = Some Potential Grants/Loans	NA	5 = Commonly Eligible for Grants/Loans
	Capital Costs	46%	$	Capital Costs	Capital Costs	Capital Costs	Capital Costs	Capital Costs
Project Readiness (5%)	Time Required for Project to Complete its Current Phase	100%	1 - 5	1 = Concept	2 = Feasibility Study	3 = Preliminary Design/Pilot Study	4 = Final Design	5 = Ready to Bid

Public Utilities Department
Wastewater Facilities
Capital Improvement Program (CIP) Prioritization Matrices

Asset Risk Matrix Index - The risk matrix applies to the following sub-criteria:

1) Reduce or Eliminate Potential Overflows
2) Minimize the Amount and Duration of Service Interruptions to Customers
3) Reduce Potential Impacts to Public and Private Property
4) Unplanned Expenses Due to Repairs and Emergencies
5) Minimize Loss of Economic Activity Due to Facilities Failure

Asset Risk Matrix Index					
			Consequence of Failure (Anticipated) [1]		
			High Volume	Medium Volume	Low Volume
			3	2	1
Probability of Failure (Anticipated)	Likely to Fail	3	9	6	3
	Less likely to Fail	2	6	4	2
	Unlikely to Fail	1	3	2	1

1 - Consequence of Failure is based on the size of facility; Pipeline will base on the following volume:
(High = greater/equal to 54"; Medium = 15" to 48"; Low = Less than 15" (group job)

Per Facility Condition:

Probability of Failure Score				
Facility Type		**1**	**2**	**3**
Pipeline[2]	Age	< 35 years old	36-50 years old	> 50 years old
	Material	PVC	VC	CP
	d/D	Non-Critical	Semi-Critical	Critical
	Condition	Maintenance	Rehab and/or Point repair	Replace
	Mantenance Frequency	12+ Months	6 - 12 Months	0 - 6 Months
	Location	Right of Way	Canyon	Near Body of Water
	Service Area	Industrial	Commercial	Residential
Pump Station		Assessment Data		
Treatment Plant		Assessment Data		

2 - Probability of failure is based on facility condition; For pipeline will base on the table if CCTV data is not available

Per Facility Redundancy:

Redundancy Score			
Facility Type	**0.1**	**0.5**	**1**
Pipeline	Full Redundancy	Some Redundancy	No Redundancy
Pump Station			
Treatment Plant			

Wastewater CIP Prioritization
Project Scoring Form

Project Proponent	
Project ID	
Project Name	
Project Type	
Project Description	**Background:** **Scope:**

Subcriteria #	***Score Type***	***Matrix***			***Raw***	**Justification**
		P	***C***	***R***		
1	Red. Potential Hazards					
2	Maintain St. Integrety					
3	Reduce Seismic Risks					
4	Reduce or Eliminate Potential Overflows					
5	Minimize Service Interruptions					
6	Meet Water Quality Standards					
7	Reduce Impacts to Public and Private Property					
8	Comply with Regulatory Requirements					
9	Comply with City Council Mandates					
10	Comply with Court Ordered Mandates					
11	Comply with System Performance Criteria					
12	Reduce Impacts on Other Projects					
13	Reduce O&M Costs in Long-Term with project implementation					
14	Reduce Fines due to Violations					
15	Unplanned Expenses due to Emergencies					
16	Increase Longevity of Asset					
17	Reduce Annual Recurring O&M Costs in short term by Imp. Proj.					
18	Minimize Loss of Economic Activity					
19	Reduce Environmental Impacts					
20	Make Efficient Use of Natural Resources					
21	Direct Benefits to the Community					
22	Agreement with General/ Community Plans					
23	Potential Grants/Loans					
24	Capital Costs					
25	Project Readiness					

P - Probalility of Failure (Anticipated)
C - Consequence of Failure (Anticipated)
R - Redundancy

FINAL CIP PRIORITIZATION RESULTS

(WASTEWATER)

Wastewater Project List
(Prioritization Results- As of November 16, 2010)

Rank	Title	Description	Facility Type
1	MBC - Chemical System Improvements (PHASE 2)	**Background:** Isolation valves and actuators in storage tank spill containment cells are inaccessible during rain or water flooding or a tank spill. Electrical conduits at floor level are also subject to flooding . As dual chemical storage tanks are piped, isolation of one tank isolation cannot be done without isolation of both tanks requiring shutdown of that entire particular chemical system when emergency repairs are needed. There is potential for siphoning out the contents of a storage tank when a downstream pipe leaks or is ruptured. Potential spill in the digester gallery when an overhead single-walled chemical pipe leaks or ruptures. Discontinued Ferrous and Ferric Chloride pumps and oversized actuators require replacement. Perforated roof causes flooding of storage tank spill containment cells. **Scope:** This project entails improvements to the ferrous/ferric and polymer chemical storage and feed systems : remove piping, motorized valves , electrical conduits from spill containment cells; improve storage tank isolation valuing and overflow piping; provide necessary access platforms for tank isolation valves; prevent siphoning of chemicals from storage tanks-install air gap standpipes; provide secondary piping on single-walled overhead piping; replace/upgrade ferric/ferrous chloride pumps and valve actuators; provide added roof supports or revise to non-perforated roof.	Treatment
2	NCWRP Grit Accumulation at the Headworks and Gates Upgrades	**Background:** The influent channels of the NCWRP's headworks were designed for the ultimate future capacity of 45 mgd/90 mgd (average/peak). Present flows are at 20-30mgd average and 45 mgd peak. Thus, existing channel velocities are very low resulting in grit settling and accumulation. A channel air agitation system is provided but gets buried by the large volume of grit. Air flows should be increased but more important, channel configuration has to be revised (sectional area reduced) to provide proper channel velocities and eliminate grit settling. The inlet and outlet gates at the two mechanical bar screens and at the bypass channel with trash rack (total of 6 gates) and the 2 influent gates at the grit tanks are corroded and require replacement. **Scope:** Revise HW Influent channels to increase flow velocities and also increase air flows for more channel flow turbulence to prevent grit accumulation. Repair or Replace existing sluice gates at screens inlets & Outlets and at grit tanks inlets (total 9 gates) .	Treatment
3	Pipeline Replacement (AA)	**Background:** This project provides for the replacement of sewer mains that are in a deteriorated condition or are undersized. This project will help meet EPA requirements to reduce sewer spills while reducing maintenance costs and extending the service life of sewer pipelines. This project is consistent with the applicable community plans and is in conformance with the City's General Plan. **Scope:** Provides approximately 20 miles of deteriorated and undersized sewer mains for the replacement at various locations within the City limits. The assumption is based on facilities near/reach its useful life.	Pipeline
4	Pipeline Rehabilitation (AA)	**Background:** This project provides for the extension of the useful life of sewers and manholes, improvements in the level of service to the residents of San Diego, and compliance with regulatory agencies' standards. This project will help meet EPA requirements to reduce sewer spills while reducing maintenance costs and extending the service life of sewer pipelines.This project is consistent with applicable community plans and is in conformance with the City's General Plan. S**cope:** Provides approximately 20 miles of of deteriorated sewers and manholes rehabilitation and repair at various locations within the City limits. The assumption is based on facilities near/reach its useful life.	Pipeline
5	MBC Dewatering Centrifuge Replacement	**Background:** (1) Existing centrifuges in operation since 1998 and are nearing end of useful life as evidenced by increase in repair frequancy. (2) Capacity of existing units is also being approached and replacement units require increased capacity for future. (3) Replacement units must fit into existing designed space with minimual modifications to limit impact on operation and reduce changeover time. **Scope:** (1) Replace 6 of the 8 existing Alfa Laval Sharples DS 706 units with Alfa Laval G2-120 units which have very similar physical size, configuration, and power requirement and increases the unit capacity from approx 225 gpm to 350 gpm. (2) Replace at the rate of 2 units per year with only 1 unit out at a time, (required to maintain dewatering capacity)	Treatment
6	PLWTP Hydroelectric Generator Isolation Valve and Penstock Restoration	***Background:*** The PLWTP Hydroelectric generator produces $360,000 worth of renewable electricity yearly. The 84-inch butterfly valve that isolates the internal components of the turbine from the ocean outfall is leaking. The inability of this valve to seal the hydro discharge from the outfall makes it practically impossible to perform inspections, maintenance and repair to the turbine, it's piping and other components within. Failure to replace this valve will lead to eminent shutdown of the hydroelectric and therefore loss of renewable energy revenue. This work is safety related and is the part of the Hydro Federal Energy Regulatory Commission inspection every three years. ***Scope:*** This project will provide a new valve on the discharge side of the Hydro. A temporary isolation of the discharge valve area is required so this work can be completed and for the penstock upgrades. 1. Replace the 84-inch butterfly valve with an 84-inch gate valve. 2. Repair and upgrade the penstock. 3. Temporary isolation of the discharge valve area so work can be performed.	Treatment
7	South Metro Sewer Rehabilitation, Phase 3B	***Background:*** This project will rehabilitate the remaining 5,000 feet of the 108 inch pipeline from Winship Lane to Pump Station 2. Sections of the South Metro Interceptor have deteriorated significantly due to the corrosive effects of sewer gases over 40 years. ***Scope:*** Rehabilitate 5,000 feet of pipeline	Pipeline

Wastewater Project List
(Prioritization Results- As of November 16, 2010)

Rank	Title	Description	Facility Type
8	Pump Station 2 Onsite Standby Power	***Background:*** Project entails the removal and disposal of the two existing natural gas reciprocating engines and the installation of two 4.6 MW natural gas turbine generators and one 206 kW diesel startup generator. Also, the two existing engine drives will be replaced with new electric motors. This new configuration will provide 100% power back-up to SDG&E thus satisfying EPA recommendations. This option will also serve as a more reliable surge protection for the force mains in the event of a power failure. **Scope:** EPA recommends that facilities like Pump Station 2 be equipped with two separate and independent sources of electrical power. The current Pump Station 2 power system does not comply with the EPA recommendations. The Pump Station 2 facility currently has three feeds, two of the feeds are from the same substation. All feeds are limited to two pumps, except during emergency conditions. Loosing two of the three feeds the pump station is limited to a 5 pump operation only. The proposed recommendation will improve the overall power reliability and enhance standby power at Pump Station 2. Also, this option will provide force main surge protection at all times during the stations operation and in the event of a total power failure.	Pump Station
9	NCWRP Influent Pump Station Bridge Cranes/Hoists and Isolation Gates/Valves Upgrades	***Background:*** The existing leaky condition of the wetwell isolation stop gates and pumps discharge isolation valves at the NCWRP Influent Pump Station does not allow for complete O&M work to be done on the main sewage pumps. As the stop gates are packed with grit/solids debris, each wetwell pump drafttube cannot be fully drained out cleaned out. Complete isolation of a pump for service cannot be done as its discharge valve leaks. The hydraulic oil driven wetwell BC/Hoist is inoperable due to corrosion damage. The pump room BCs & hoist's present arrangement does not allow separate servicing of valves on the discharge piping without dismantling the pump-motor shafting arrangement. **Scope:** Refurbish existing wetwell isolation stop gates. Remove/re[place existing pump discharge isolation valves. Replace existing inoperable hydraulic bridge crane in wetwell, install electric, non-explosive type crane/hoist. Install a new bridge crane or monorail hoist above Pumps discharge check & gate valves.	Treatment
10	NCWRP -EDR Mechanical Upgrades	***Background:*** Due to many years of exposure to environmental elements, the first 3 Electro-Dialysis Reversal (EDR) units installed in 1998 including EDR valves, piping, tubings, electrical conduits, racks, and covers have experienced damage, corrosion, and degradation. Other upgrades require installation of soft start on the recycle pumps, replacement of EDR stack covers and the addition of a mixer on the brine tank. **Scope:** Replace /upgrade all faulty and deteriorating the EDR units equipment and appurtenances.	Treatment
11	EMTS - Lab Boat Dock and Steam Line	***Background:*** The Environmental Monitoring and Technical Services Lab (EMTS Lab) Boat Dock and Steam Line Project provides for the design and construction of a boat dock located in the channel adjacent to the EMTS Laboratory, as well as under-grounding approximately 600 feet of an above ground steam line situated along the frontage of the boat channel. ***Scope:*** A 40,000 square foot ocean monitoring laboratory was constructed and is now in operation. As a part of the Public Benefit Conveyance of this property, Public Utilities is required to construct a boat dock and to fund a portion of the esplanade improvements along our frontage. To gain future unobstructed access to the boat dock within the adjacent boat channel, and to provide unobstructed access to the future esplanade, the existing steam line must be underground. Public Utilities currently leases boat dock space at Driscoll's Wharf, and this project would eliminate this ongoing expense.	Other
12	Bayshore TS (plus d/s portion of PS4)	**Background:** Bayshore Trunk Sewer (TS#39) was built in 1952 and is approximately 6,200 feet long. It is located in Roseville community, District 2. The trunk sewer consists of 18-inch and 21-inch Vitrified Clay pipes. The trunk sewer's capacity was evaluated and the hydraulic model predicted that it will reach the capacity between 2017-2020. The condition was also assessed and recommended for improvement as described in the scope. **Scope:** 1. Proposed to replace 1,900 feet of pipes (new parallel alignment) 2. Proposed to rehabilitate 2,000 feet of pipes (existing alignment)	Pipeline
13	NCWRP - Primary Sedimentation Tanks Odor Control System Upgrades	**Background:** The present odor control system at the Primary Sedimentation Tanks was designed to treat foul air from the tanks with 0-25 ppm of hydrogen sulfides. Current actual H2S readings are from 10-80ppm posing potential SDAPCD air discharge violations including public complaints. The foul air ducting at the OCS facility are leaking at the isolation dampers due to damaged seals and leaves of the butterfly valves. **Scope:** Upgrade the Odor scrubbers to treat foul air with 0-100ppm H2S by possibly adding one unit each of the carbon and packed chemical adsorbers along with increased foul air volume withdrawal from the tanks.	Treatment
14	Second La Jolla-Pacific Beach TS	**Background:** Second La Jolla – Pacific Beach Trunk Sewer (TS #61) was originally built in the 1960's and is approximately 6.8 miles long. It is located in the La Jolla and Pacific Beach communities, Districts 1 & 2. The size of the pipe varies from 18 to 48 inches in diameter. The pipe material is Vitrified Clay (VC) and Reinforced Concrete Pipe (RCP). The trunk sewer's condition was assessed and recommended for improvement as described in the scope. **Scope:** 1. Proposed to replace 3,500 feet of pipes. 2. Proposed to rehabilitate 5,600 feet of pipes.	Pipeline
15	SBWRP - Demineralization Facility Phases 1 & 2	**Background:** This project provides for demineralization of reclaimed water. Phase I will construct a demineralization facility to provide 7.5 million gallons a day (MGD) of reclaimed water for conveyance to the users. Phase II will expand the facility to provide 15 mgd of reclaimed water. The majority of reclaimed water is used for irrigation. Demineralization will reduce the level of total dissolved solids in the reclaimed water. **Scope:** 1. Install 3 EDR units at SBWRP for Phase 1 2. Install 3 EDR units at SBWRP for Phase 2	Treatment

Wastewater Project List
(Prioritization Results- As of November 16, 2010)

Rank	Title	Description	Facility Type
16	MBC - Odor Control Facility Upgrades	**Background:** The odor control facility serves various solid treatment processes. Several areas at the Metro Biosolids Center (MBC) have been identified to cause significant odor problems due to foul air collection deficiencies because of insufficient fan capacities and high ducting pressure losses, including poorly located foul air collection registers. Capacity Upgrades to fans, installation of variable-speed motors; removal/replacement of high pressure loss ducting with Installing access platforms at the monitoring instruments and air volume control dampers will provide safe and timely access for operation and maintenance personnel **Scope:** This project will upgrade fan capacities to provide required air changes in foul air generating areas; install fumehood foul air collection system at the truck loadout stations and at the degritting room;	Treatment
17	Tecolote Canyon TS	**Background:** Tecolote Canyon Trunk Sewer (TS #8) was originally built in the 1950's and is approximately 6.5 miles long. It is located in Clairemont Mesa, Bay Park, and Linda Vista communities, District 6. The size of the pipe varies from 12 to 27 inches in diameter. The pipe material is mostly Vitrified Clay (VC). The trunk sewer's capacity was evaluated and the hydraulic model predicted that it will reach the capacity between 2017-2020. The trunk sewer's condition was assessed and recommended for improvement as described in the scope. **Scope:** 1. Proposed to replace 13,700 feet of pipes (670 feet due to condition). 2. Proposed to rehabilitate 1,300 feet of pipes.	Pipeline
18	Wet Weather Storage Facility - Phase I	**Background:** This project includes the implementation of the Live Stream Discharge of reclaimed water from the North City Water Reclamation Plant durinThis project includes the implementation of the Wet Weather Stream Discharge of reclaimed water from the North City Water Reclamation Plant during heavy rain events to offload wet weather sewer system flows. It will be implemented only during extreme wet weather events when PS2 capacity is approached, and it woud be an interim solution until long-term capital projects are completed, ie storage tank , SBWTP, and/or IPR. This project also includes constructing a seven-million gallon (7-MG) Underground Storage Tank at the Liberty Station (vacated Naval Training Center) to provide hydraulic relief to the Pump Station 2, the South and North Metro Interceptors, and the major trunk sewers **Scope:** The facility will reduce the risk of potential wet weather overflows, which may be caused by the capacity limitation of the Metro Pump Station 2 during extreme rainfall events.	Other
19	Mission Village TS	**Background:** Mission Village Trunk Sewer (TS #35) was originally built in the late 1950's and is approximately 3.7 miles long. It is located in Mission Valley East and Serra Mesa communities, District 6. The size of the pipe varies from 10 to 24 inches in diameter. The pipe material is Vitrified Clay (VC) and Polyvinyl Chloride (PVC). The trunk sewer's condition was assessed and recommended for improvement as described in the scope. **Scope:** 1. Proposed to replace 8,100 feet of pipes. 2. Proposed to rehabilitate 500 feet of pipes.	Pipeline
20	East Mission Gorge Force Main (EMGFM)	**Background:** The East Mission Gorge Force Main (EMGFM) terminates at the North Mission Valley Interceptor Sewer near the intersection of Fairmount Avenue and Twain Avenue. The force main is a 48-inch diameter concrete cylinder pipe approximately 8-miles in length and constructed in 1993, same time as East Mission Gorge Pump Station. The force main was assessed and recommended for improvement as described in the scope. **Scope:** 1. The rehabilitation method is based on downsizing of the entire 8-miles pipeline to 30 inch inside diameter using HDPE slip lining to provide the desired minimum velocity of 5 fps.	Pipeline
21	Jamacha Road TS	**Background:** Jamacha Road Trunk Sewer (TS #27) was originally built in the late 1970's and is approximately 4.8 miles long. It is located in the Jamacha Lomita, Skyline, Encanto, and Valencia Park communities, District 4. The size of the pipe varies from 10 to 30 inches in diameter. The pipe material is Vitrified Clay (VC). The trunk sewer's condition was assessed and recommended for improvement as described in the scope. **Scope:** 1. Proposed to replace 6,300 feet of pipes. 2. Proposed to rehabilitate 1,900 feet of pipes.	Pipeline
22	Pacific Beach Drive TS	**Background:** Pacific Beach Drive Trunk Sewer (TS #64) was originally built in the 1970's and is approximately 1.3 miles long. It is located in Pacific Beach community, District 2. The size of the pipe varies from 12 to 18 inches in diameter. The pipe material is Vitrified Clay (VC). The trunk sewer's condition was assessed and recommended for improvement as described in the scope. **Scope:** Proposed to replace 6,200 feet of pipes.	Pipeline
23	SPS 13- Tolumaine Beach PS	**Background:** (FY209 Condition assessment) Pump station serves comfort station constructed in 1962 and upgraded in 1982.. Replacemet/rehab required to address critical safety issues (wetwell opens into drywell) and other item to bring into compliance with Sewer Design Guide (SDG). Heavy equipemet and structural corrosion evident. **Scope:** Review and updated existing BCE from 2007 which recommended upgrade but does not address all issues. Assume new wetwell for submersible pumps and new electrical for upgrade.	Pump Station
24	Kearny Mesa TS	**Background:** Kearny Mesa Trunk Sewer (TS #17) was originally built in the early 1960's with 40% upgraded pipelines in the late 1970's and is approximately 11.5 miles long. It is located in the Kearny Mesa, Serra Mesa, Birdland, and Mission Valley East communities, District 6. The size of the pipe varies from 12 to 36 inches in diameter. The pipe material is Vitrified Clay (VC) and Polyvinyl Chloride (PVC). The trunk sewer's condition was assessed and recommended for improvement as described in the scope. ***Scope:*** 1. Proposed to replace 11,300 feet of pipes. 2. Proposed to rehabilitate 11,700 feet of pipes.	Pipeline

Wastewater Project List
(Prioritization Results- As of November 16, 2010)

Rank	Title	Description	Facility Type
25	MBC - Stream Discharge Dechlorination Facility	**Background:** This project is part of the Wet Weather Stream Discharge of reclaimed water from the North City Water Reclamation Plant during extreme wet weather events. This project includes construction of a dechlorination facility, a necessary component of the Wet Weather Stream Discharge project. It will be implemented only during extreme wet weather events when PS2 capacity is approached, and it would be an interim solution until long-term capital projects are completed, i.e. storage tank , SBWTP, and/or IPR. **Scope:** This project will include building a dechlorination structure to dechlorinate approximately 16 mgd - 30 mgd of treated RW from 36" RW pipe at MBC side and discharge it into San Clemente stream. This structure will be build near stream discharge facility.	Treatment
26	MBC - Valve Access Platforms Installation in Biosolids Storage Building	**Background:** Existing piping/valves arrangement causes multiple trains of equipment to be removed from service when a valve or its actuator fails and needs to be repaired or maintained. Poor and unsafe access to these valves result in lengthy and costly repair times and impacting solids storage and delivery capacities. Existing hard to access valves especially those at elevated levels pose safety problems to O/M personnel. **Scope:** Evaluate valve accessibility options including the use of , ladders, scaffolding, platforms, and/ or catwalks and provide best and safe alternative(s).	Treatment
27	South Bay Pump Station and Conveyance System Phase 1	**Background:** The project consists of installing a diversion structure, pump station and force main to divert flow from the South Metro Interceptor to the South Bay Secondary Treatment Plant from Sweetwater area to the South Bay Secondary Plant. Phase 1 will have an average capacity of 21 mgd with the ultimate peak capacity at 103 mgd.	Pump Station
28	MBC - New Biosolids Truck Loadout Facility	**Background:** The existing biosolids storage facility houses also the truck loadout stations posing safety concerns due to foul odors and truck fumes for the MBC operators and maintenance staff. To cope with increased biosolids flows sent to MBC in future, a larger capacity truck loadout facility is needed. **Scope:** This project proposes to construct a new separate automated loadout facility to provide additional loudout stations at MBC. Not considered till 2020, pending secondary treatment at PLWTP.	Treatment
29	South Bay Waste Water Treatment Plant Phase 1	**Background:** The South Bay Secondary Treatment Plant and Sludge Processing Facilities Phase 1 will be constructed on the Dairy Mart Road site adjacent to the existing SBWRP by 2030 assuming current MER limit for PLWTP discharge. The Phase 1 of the South Bay Secondary Treatment Plant (SBSTP) will be 21 mgd and the Sludge Processing Facility will process the sludge from the existing 15 mgd SBWRP and the new 21 mgd SBSTP	Treatment
30	South Bay Pump Station and Conveyance System Phase 2	Project envisioned beyond 2050	Pump Station
31	SPS 5 -1795 Harbor Drive	**Background:** (FY2010 MUNI PS Condition Assessment) Station constructed in 1997 and upgraded in 2994. Station tributary area included Convention Center. Station is plagued with chronic pump problems with typically only 3 of 4 pumps operable. Peak wet wet weather flow approaches capacity of 2 pumps. Problems appear associated with both the configuration of the wetwell inlet (which deposits solids over one pump inlet) and with high level of rages and debris in wastewater flow. Several valve not functional make pump repair difficult. Flow meter not functioning. Convention center expansion will increase flows. **Scope:** Submit to BCE to deter best way to address present problems and plan for potential increase in flow from convention center expansion.	Pump Station
32	PS 77 A/B Upgrade	**Background:** SPS 77B is a booster station for SPS 77A. Pumps in 77B were designed to operate in conbination with the pumps is 77A by matching operating speed. Pump Station 77B variable speed magna drives failed. As an emergency measure, the station is being operated in a constant speed mode. Replacement of the failed magna drives with variable frequancy drives is along with other improvements is planned., A study is being preformed to determine if constant speed operation mode for 77B is approproate for the long run. **Scope:** Install three VFD Drives in 77B, provide MCC upgrades and replace defective check valves.	Pump Station
33	Flow Metering at PS 1	**Background:** This project is the result of the WWTD efficiency study of the Automation of major Pump Stations. The goal is to try to reduce the number of operator interventions in the current control strategy and make the strategy more user friendly. Monitoring the incoming flow would allow automatic flow control at Pump Station 1. **Scope:** Modify six existing ADS flow meters upstream of pump station 1 to provide live flow data to the Pump station 1 DCS system to provide automatic flow control.	Pump Station
34	SPS 86 - 5890 Copley Dr.	**Background:** (FY2010 Muni PS Condition Assessment) Station constructed in 1994 and does not comply with SDG on several issues, most importantly on providing sufficent access area for equirpment maintenance. Pump station projected wetweather flow is higher that design rating. Station recieves domestic flow from MBC. Pump reliability is constant issue (low bearing and seal life and volute wear due to grit and rocks reported in wetwell) Spare parts for PACO pumps difficult to procure. Station design prohibits installation of substitute (other manufactures's) unit very difficult. Valve chamber floods and pump station flow meter does not function. **Scope:** Submit to BCE process to determine most appropriate approach to address the capaicty issue (increase capacity or divert MBC flows) and address the other issues.	Pump Station
35	South Bay Waste Water Treatment Plant Phase 2	**Background:** Phase 2 will provide a 28 mgd capacity increase to Phase 1 (view item 28 above) of project for a total capacity of 49 mgd. Project envisioned beyond 2050	Treatment

Wastewater Project List
(Prioritization Results- As of November 16, 2010)

Rank	Title	Description	Facility Type
36	Mira Mesa TS	**Background:** Mira Mesa Trunk Sewer (TS#42) was built in the early 1960's and is approximately 7.4 miles long. It is located in Mira Mesa community, District 5. The size of pipe varies from 12 to 30 inches in diameter. The pipe material is made of Vitrified Clay (VC). The trunk sewer's condition was assessed and recommended for improvement as described in the scope. Proposed to replace approximately 9,900 feet of pipes	Pipeline
37	SPS 85- 11513 Alborado Dr.	**Background:** (FY2010 Muni PS Condition Assessment) Station constructed in 1993 and utilizes self-priming pumps. Station has single 4-in force main. Measured pump capacity of 35 to 50 gpm is 25 to 35% of pump design. Force main exhibits headloss much higher than expected (32 ft vs 4 ft.) Indicating partial plugging. Noticable grease in wetwell, possible source of plugging. **Scope:** Check force main for confirm pluggng, clean as necessary. Provide 2nd force main. Address other items such as lack of gas detection in pump room.	Pump Station
38	SPS 23T - 1190 Cactus Road	**Background:** (FY 2009 Condition Assessment) Station constructed in 1987 as temporary station. Mechanical/Electrical upgrade in 2004. Station capacity 2000gpm. Original plan was to abandon station when Otay Mesa Trunk Sewer installed. Trunk sewer no longer considered viable. Existing station does not comly with SDG criteria and has high maintenance costs caused by self-priming pumps and difficult access to wetwell. Station electrical gear is located underground and is potentially subject to flooding and catestrophic failure. Pump reliability currently an issue. **Scope:** Submit to station to BCE process to determine most approprate way to address issues.	Pump Station
39	SPS 45 - 9888 LaJolla Farms Road	**Background:** (FY2010 Muni PS Condition Assessment) Pump station constructed in 2005. Station capacity 2000 gpm @ 260 ft. with 200 hp pumps. Pumps measured capacity in 2700 to 2800 resulting potenital cavitation and minor motor overload. One variable speed unit is out of service and check valve is leaking causing noticable backflow. **Scope:** Submit to BCE to determine most cost effective approach to address operational problems. One approach would be to trim inpellers and modify pump inlet piping to address cavitation and motor overloading. Repair /replace existing VFD or continue to operate station as constand speed.	Pump Station
40	PLWWTP - South Access Road Protection Project	**Background:** This project provides for continued access to the Point Loma Wastewater Treatment Plant and investigates, and may implement, options to mitigate erosion at two sea coves adjacent to the plant's access road. **Scope:** The treatment plant has only one access road as granted by the federal government and this project is needed to ensure continued access.	Treatment
41	MBC - Dewatered Biosolids Storage & Loading - AHU Piping Modifications	**Background:** Chilled water valves and piping for air handling units are dangerously located above MCC's and pose risk of damaging electrical equipment in the event of a leak or spill from these assets during repair/ maintenance work. Potential safety hazard (electrocution) from damaged electrical equipment. **Scope:** Reroute piping, relocate leaky valves and provide condensate pan/ drain from AHU.	Treatment
42	SPS 72 - 11928 Paseo Lucido	**Background:** (FY2010 Muni PS Condition Assessment) Pump station constructed in 1983 and upgraded to add building to house pumps and electrical equipement. Sation utilizes self priming pumps and does not conform to SDG requirement. Most inportant non-compliant issue is safety in that the wetwell access in from within the builiding. Station pump performance, is below the design value and results in non self cleaning velocities. Force main pressure reading indicate potential blockage. Building requires repairs to roof. Stand by force main required. **Scope:** Submit station to BCE process to address all issues and determine the most appropriate approach to bring station into compliance with BCS restore reliability, and install 2nd force main..	Pump Station
43	MBC - Area 76: Control Room Emergency Air Supply	**Background:** During a power outage, foul air and hazardous gases accumulate in the centrifuge building, including the operation control room posing safety concern besides absence of Air-conditioned air for delicate electrical equipment and room comfort for the MBC operators. **Scope:** Provide HVAC capability for Area-76 Control Room during emergency MBC power shutdowns.	Treatment

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APPENDIX D:

Metro Wastewater CIP Project

Forecasted Expenditure Plan

PUBLIC UTILITIES DEPARTMENT
Metro CIP Projects FY2012 - 2016
Expenditure Projection as of December 2011

Parent WBS PUD	PROJECT TITLE	STATUS	Start Construction	Finish Construction	Total Project Cost	FY12	FY13	FY14	FY15	FY16
ABO00001	**Annual Allocation Metro Treatment Plants** This annual allocation provides for improvements and modifications to the existing Metro facilities to implement operating efficiencies, optimization of existing facilities and compliance with revised regulatory and operation plan requirements.					**$4,461,398**	**$7,350,900**	**$4,050,000**	**$500,000**	**$2,000,000**
	MBC Access Road Drainage Improvements Improvements to the road drainage system including installation of 6" perforated PVC (french drains), installation of 6" PVC pipe, modifications to existing catch basin, repair existing brow ditch,and regrade affected area.	Awaiting Contract Award	Jan-12	May-12	$270,200					
	MBC Water Systems Improvements (D/B) This project will improve the reliability of the process water system at the Metro Biosolids Center Facility.	Under construction	Aug-10	Dec-11	$1,179,355					
	MBC Chemical System Imp. - Phase 2 This project provides improvements to the chemical handling/feed systems at MBC, including the relocation and reroute of electrical wiring and conduits, relocation of valve actuators and installation of platforms to access valve actuators.	Procure Designer	Jan-14	Sep-14	$4,200,000					
	North City Cogeneration Facility (D/B) ** This project is for the purchase and installation of a 1.6 MegaWatt engine generator at the North City Water Reclamation Plant.	Design/Build Selection	Mar-12	Jul-12	$4,150,900					
	PLWTP PC 6 Transformer Cabinet & Switchboard (GRC) This project is to replace the transformer cabinet and switchboard for Power Center 6.	Awaiting Proposal	Dec-11	Mar-12	$300,000					
	PTL Sedimentation Basins Equip Refurbish (D/B) This project is to replace the mechanical equipment and electrical equipment in all twelve sedimentation basins at the Point Loma Wastewater Treatment Plant.	Awaiting Contract Award	Dec-11	Apr-13	$7,954,500					
	PLWTP Hydroelectric Generator Isolation Valve & Penstock Restoration This project is to replace the 84-inch butterfly valve with an 84-inch gate valve and upgrade the penstock.	Planning	Dec-15	Dec-16	$2,500,000					
ABP00002	**Annual Allocation Metropolitan System PS** This annual allocation provides for comprehensive upgrades, design modifications, and renovations or replacement of equipment such as pumps, valves, tanks, controls, odor control systems, etc. at Metropolitan System Pump Stations (Pump Stations 1, 2, Otay River and Grove Avenue).					**$2,000,000**	**$0**	**$0**	**$0**	**$0**
	PS1 & 2 Elect Upgrade & New Building at PS2 This project is to upgrade the electrical systems at Pump Stations 1 and 2 and construct a new building at Pump Station 2.	Under construction	Jan-09	Feb-12	$9,935,000					
	PS 1 Emergency Power Generator This project is to install an emergency power generator at Pump Station 1.	Planning	TBD	TBD	TBD					
AJB00001	**Annual Allocation MWWD Trunk Sewers**					**$50,000**	**$150,000**	**$4,250,000**	**$3,711,500**	**$0**
	PS-2 Force Main 1 Siphon & WPLIS Repair This project consist of two phases: Phase A will repair the damaged liner on the Pump Station 2 Rosecrans Force Main Siphon. Phase B consists of repairing the damaged liner and underlying reinforced concrete pipe (RCP) on the West Point Loma Interceptor Sewer (WPLIS).	Planning	Jan-14	Jul-14	$1,500,000					
	Rose Canyon Trunk Sewer (RCTS) Joint Repair This project is to repair 1,281 PVC welded pipe joints for pipe diameters ranging from 54-inch to 72-inch.	Planning	Feb-13	Feb-14	$6,233,000					
	Sewer Junction/Diversion Structure Rehab This project involves installation of PVC liner in Rose Canyon Junction Structure 169, 84-inch pipeline, and repair the stop log tracks and guide rails for the 96-inch pipe at Diversion Structure on Barnett Avenue.	Planning	Nov-12	Jul-13	$700,000					

Parent WBS PUD	PROJECT TITLE	STATUS	Start Construction	Finish Construction	Total Project Cost	FY12	FY13	FY14	FY15	FY16
Standalone Projects										
S00319	**EM&TS Esplanade & Steam line Relocation** This project provides for the design and construction of a boat dock, an esplanade (park) within an approximately 1.25 acre parcel located between the existing Public Utilities laboratory and adjacent boat channel, as well as under-grounding approximately 600 feet of an above ground steam line situated along the boat channel.	Planning	Mar-14	Mar-15	$2,000,000	$0	$100,000	$1,497,884	$286,398	$0
S00322	**MBC - Biosolids Storage Silos** This project provides for two additional biosolid storage silos (numbers 9 and 10).	Design	Jul-13	Sep-14	$7,353,500	$100,000	$100,000	$5,000,000	$800,000	$0
S00321	**MBC - Centrate Collections Upgrades** This project provides for converting the existing foul air ducting into dual-use headers for centrate and foul air collection and will increase the size of the existing centrate collection headers.	Completed	Sep-10	Jun-11	$2,311,159	$27,061	$0	$0	$0	$0
S00339	**MBC Dewatering Centrifuges Replacement (D/B)** This project provides for the replacement of six of the eight existing dewatering centrifuges with six larger capacity units to handle larger future biosolids flows. The existing units are also near the end of their useful life.	Design/Build Procurement	Oct-12	Jul-15	$12,000,000	$500,000	$1,000,000	$3,500,000	$5,200,000	$1,800,000
S00323	**MBC Odor Control Upgrade** This project provides for upgrading the odor control system fans and ducting to reduce system headlosses and improve overall foul air collection efficiency at the various process areas. Access platforms will also be installed at monitoring instruments and damper locations. This project will be implemented in three phases.	Design Procurement	Jul-13	Oct-14	$5,200,000	$500,000	$500,000	$2,800,000	$1,500,000	$0
S00309	**NCWRP Sludge PS Upgrade** This project will entail a study to determine the source of the vibration and to implement a remediation plan to eliminate the vibration and thus reduce maintenance, and increase equipment life.	Design	Sep-12	Feb-13	$457,600	$283,000	$232,845	$0	$0	$0
L10000	**Ovation Upgrades (Metro Facilities Control System)** This project provides for replacement and upgrade of existing control systems at various Metropolitan Wastewater treatment and pump station facilities. These include the Point Loma Treatment Plant (PLWTP) and North City Water Reclamation Plant (NCWRP),	Under construction	Aug-11	Oct-14	$7,250,000	$3,200,000	$1,470,000	$2,580,000	$0	$0
S00315	**PLWWTP Grit Processing (GIP)** The Grit Processing Improvements project will include reconstruction of the old south grit tanks and their adjacent pump gallery, replacement of the headworks building that was constructed in 1962 with a new drive-through facility, expansion of an existing odor removal system and replacement of auxiliary equipment.	Under Construction	Mar-11	Dec-13	$32,922,630	$8,000,000	$8,000,000	$4,500,000	$0	$0
S00312	**PS2 Power Reliability & Surge Protection** This project will remove two existing natural gas reciprocating engines and install of two 4.6 megawatt (MW) natural gas turbine generators and one 206 kilowatt (kW) diesel startup generator at Pump Station 2. The two existing engine drives will be replaced with new electric motors. This new configuration will provide the required surge protection against an electrical utility outage and comply with Environmental Protection Agency (EPA) recommendation of standby power for essential facilities.	Consultant Procurement	Jan-14	Jun-15	$31,230,000	$150,000	$1,850,000	$14,000,000	$14,000,000	$1,000,000
S00317	**South Metro Sewer Rehabilitation Phase 3B** This project will rehabilitate the remaining 5,000 feet of the 108 inch pipeline from Winship Lane to Pump Station 2.	Planning	TBD	TBD	$9,214,957	$0	$0	$0	$0	$200,000
S00310	**SBWRP Plant Demineralization Facility** This project provides for demineralization of reclaimed water. Phase I will construct a demineralization facility to provide 7.5 million gallons a day (mgd) of reclaimed water for conveyance to the users. Phase II will expand the facility to provide 15 mgd of reclaimed water.	Planning	TBD	TBD	TBD	$0	$0	$0	$0	$0
S00314	**Wet Weather Storage Facilities** This project includes the implementation of the Live Stream Discharge of reclaimed water from the North City Reclamation Plant during heavy rain events to reduce the capacity demand on the downstream sewer system and facilities. This project also includes constructing a seven million gallon Underground Storage Tank at Liberty Station (vacated Naval Training Center) to provide hydraulic relief to Pump Station 2, the South and North Metro Interceptors, and the major trunk sewers.	Planning	Jul-15	Dec-16	$112,001,859	$50,000	$100,000	$200,000	$500,000	$3,000,000
Grand Total					**$260,864,660**	**$19,321,459**	**$20,853,745**	**$42,377,884**	**$26,497,898**	**$8,000,000**

** The estimated project cost of $4,150,900 for the North City Cogeneration Facility project includes the compressor upgrade. However, this cost could increase if the compressor is to be replaced.

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Appendix E:
Project List for MBC and NCWRP Facilities

MBC Projected Budget Allocations
(In 2012 Dollars)

PROJECT TITLE	ESTIMATED TOTAL PROJECT COST ($ Millions)	START DATE (FY)	FINISH DATE (FY)
Odor Control Facility Upgrades	5.13	2007	2015
Biosolids Storage Silos 9 &10	7.35	2007	2015
Access Road Drainage Improvements	0.27	2009	2012
Dewatering Centrifuge Replacement	12.00	2009	2016
Water Systems Improvements	1.18	2010	2012
Chemical System Improvements Phase 2	4.20	2012	2015
Emergency Stream Discharge De-chlorination Facility	2.25	2014	2017
Area 76 – Control Room Emergency Air Supply	0.08	2017	2018
Valve Access Platforms Installation In Biosolid Storage Building	5.27	2022	2024
New Biosolids Truck Load Out Facility	23.44	2038	2044
Total	**61.17**	**-**	**-**

NCWRP Projected Budget Allocations
(In 2012 Dollars)

PROJECT TITLE	ESTIMATED TOTAL COST ($ Millions)	START DATE (FY)	FINISH DATE (FY)
Advanced Water Treatment Facility Demonstration Project (IPR)	6.60	2010	2012
Sludge Pump Station Upgrade	0.46	2010	2013
Headwork Influent Channel Modifications	0.25	2017	2018
North City Cogeneration Facility	4.20	2011	2013
Aeration Basin Anoxic Zone Mixers	0.16	2017	2018
Influent Pump Station Vibration	0.34	2017	2018
Headworks Scum Concentrators	0.06	2017	2018
Utility Trench Cover Replacement	0.09	2017	2018
Primary Effluent Channel Mixers	0.05	2017	2018
Vault Drainage System Implementation	0.20	2018	2019
Grit Piping Y-Access Ports	0.06	2018	2019
Butterfly Valve Upgrade	0.05	2018	2019
Total	**12.52**	**-**	**-**

PROJECT DESCRIPTIONS

MBC Project Descriptions

Odor Control Facility Upgrades

This project provides for upgrading the odor control system fans and ducting to reduce system headlosses and improve overall foul air collection efficiency at the various process areas. Access platforms will also be installed at monitoring instruments and damper locations. This project will be implemented in three phases. Several areas at the Metro Biosolids Center (MBC) have been identified to cause significant odor problems due to foul air collection deficiencies because of insufficient fan capacity and high headlosses, including poorly located foul air collection registers. Installing access platforms at the monitoring instruments and air volume control dampers will provide safe and timely access for operation and maintenance needs. The estimated cost for this project is approximately $5.13 million in 2012 dollars.

Biosolids Storage Silos 9& 10

This project provides for two additional biosolid storage silos (nos. 9 and 10). Existing eight silos in operation since 1998 and mechanical systems are nearing end of useful life as evidenced by increase in repair frequency. Major rehabilitation required and would require a silo be out of service for up to 6 months. Existing cake storage capacity is fully utilized during long weekends. Additional storage volume required. New silos needed to facilitate major rehabilitation on existing units and for increased cake storage capacity in the future. Design and install two new silos, cake pumps and associated equipment to integrate them into the existing system. This will provide replacement capacity allowing the existing units to be taken out of service for rehabilitation and for increased cake storage capacity. The estimated cost for this project is approximately $7.35 million in 2012 dollars.

Access Road Drainage Improvements

This project is to construct drainage improvements to intercept and re-direct the storm water away from the access road. Per the MBC Capacity, Condition, and Operation Assessment Report and the Master Plan for 2005-2030 (Camp) Report, There is erosion in the existing access road caused by poor CALTRANS drainage. The estimated cost for this project is approximately $0.27 million in 2012 dollars.

Dewatering Centrifuges Replacement

This project provides for the replacement of six of the eight existing dewatering centrifuges with six larger capacity units to handle larger future biosolids flows. The existing units are also near the end of their useful life. This project will increase the production capacity of the dewatering centrifuges to accommodate plant shutdowns for maintenance and construction, to accommodate future flows, and to address diverse types of constraining operational factors that limit current capacity. To achieve the required capacity, the existing dewatering centrifuge units must be replaced with larger units. The estimated cost for this project is approximately $12.00 million in 2012 dollars.

Water Systems Improvements

This project will provide the water systems with reliable operating capacities and pressures during critical demands of the solids including chemical processes. The estimated cost for this project is approximately $1.18 million in 2012 dollars.

Chemical Systems Improvements

This project is to relocate motorized valves and electrical conduits and wiring in the spill containment areas of the Caustic Soda and Sodium Hypochlorite storage and feed piping systems to avoid submergence. Congested piping valves and electrical conduits in the spill areas are in violation of OSHA safety requirements. Per the MBC Capacity, Condition and Operation Assessment Report and Master Plan for 2005-2030 (Camp) Report, motorized pump isolation and routing valves subject to damage by chemical flooding. Valves are inaccessible for repair. The estimated cost for this project is approximately $4.20 million in 2012 dollars.

Emergency Stream Discharge De-chlorination Facility

This project is part of the Emergency Stream Discharge of reclaimed water from the North City Water Reclamation Plant during extreme wet weather events. This project includes construction of a de-chlorination facility, a necessary component of the Emergency Stream Discharge project. It will be implemented only during extreme wet weather events when PS2 capacity is approached, and it would be an interim solution until long-term capital projects are completed, i.e. storage tank, SBWTP, and/or IPR. This project will include building a de-chlorination structure to de-chlorinate approximately 16 mgd - 30 mgd of treated RW from 36" RW pipe at MBC side and discharge it into San Clemente stream. This structure will be build near stream discharge facility. The estimated cost for this project is approximately $2.25 million in 2012 dollars.

Valve Access Platforms Installation in Biosolid Storage Building

Existing piping/valves arrangement causes multiple trains of equipment to be removed from service when a valve or its actuator fails and needs to be repaired or maintained. Poor and unsafe access to these valves result in lengthy and costly repair times and impacting solids storage and delivery capacities. Existing hard to access valves especially those at elevated levels pose safety problems to O/M personnel. Evaluate valve accessibility options including the use of, ladders, scaffolding, platforms, and/ or catwalks and provide best and safe alternative(s). The estimated cost for this project is approximately $5.27 million in 2012 dollars.

New Biosolids Truck Load Out Facility

The existing biosolids storage facility houses also the truck loadout stations posing safety concerns due to foul odors and truck fumes for the MBC operators and maintenance staff. To cope with increased biosolids flows sent to MBC in future, a larger capacity truck loadout facility is needed. This project proposes to construct a new separate automated loadout facility to provide additional loadout stations at MBC. Not considered till 2044, pending secondary treatment at PLWTP. The estimated cost for this project is approximately $23.44 million in 2012 dollars.

Area 76 – Control Room Emergency Air Supply

During a power outage, foul air and hazardous gases accumulate in the centrifuge building, including the operation control room posing safety concerns. The absence of air conditioned can cause potential damage to delicate electrical equipments and uncomfort condition to operators. The estimated cost for this project is approximately $0.08 million in 2012 dollars.

NCWRP Project Descriptions

Advanced Water Treatment Facility Demonstration Project (IPR)

This project explores the feasibility of the project's treatment technology to produce water that can be sent to a reservoir and later be distributed as drinking water. During the time the Demonstration Project is in operation, the advanced treated water will be frequently tested to determine the effectiveness of the treatment equipment in removing contaminants; operational data will be gathered and analyzed to refine operation and maintenance estimates for a full scale system; and tours will be conducted as part of the public outreach effort. The Demonstration Project is the second phase of a three phase program that could lead to implementation of a full-scale Indirect Potable Reuse/Reservoir Augmentation (IPR/RA) project. A rate increase to fund the Demonstration Project was approved on November 18, 2008, and went into effect on January 1, 2009. This project was established by Ordinance-19887 Section IV-A, with an initial budget of $7.2 million. The estimated cost for this project is approximately $6.60 million in 2012 dollars.

Sludge Pump Station Upgrade

The North City Water Reclamation Plant (NCWRP) Sludge Pump Station has excessive vibration of the pump and flywheel contributes to wear and tear of equipment. The vibration also generates tremendous heat. The excessive vibration and heat can cause premature failure of equipment, impact operational efficiency and have structural impacts at the facility. A study to determine the source of the vibration and a remediation plan to eliminate the vibration has been completed. This project is to replace the existing 250 HP pump with small pump, 150 HP, including the replacement of 12 Air Vac to fix the vibration problem. The estimated cost for this project is approximately $0.46 million in 2012 dollars.

Headworks Influent Channel Modifications

This project will investigate alternative methods to increase velocity through the influent channel to prevent the accumulation of grit. Due to large channels, the velocity of the flow is very low which results in grit settlement in the channels before and after the screens. The maintenance staff has observed that an average 2-3 feet of grit accumulates and must be manually removed on a regular basis. The estimated cost for this project is approximately $0.25 million in 2012 dollars.

Aeration Basin Anoxic Zone Mixers

Replace all mixers with units which are more reliable inside anoxic zone 1. The total project cost is $138,000 and a priority of 1 has been assigned to this project. A free trial mixer (180

days) may be installed to test the reliability of the unit. The submerged mixers in all zones have been very unreliable and continuously fail. Currently, only about half of the mixers are in operation. The current strategy is to keep all mixers in anoxic zone 1 in service, since there are no coarse bubble diffusers in this zone. Then repair all units in zones 2 and 3 since they are not as critical as in zone 1. The estimated cost for this project is approximately $0.16 million in 2012 dollars.

North City Cogeneration Facility

This project will consist of all earthwork, berms, retaining walls, curbs, gutters and storm drainage required to fully enclose the facility, provide gated access to the facility by extending the north access road and installing solid sound attenuating gate and side extensions, including electrical interface work to tie the power generator equipment to the designated NCWRP power center, connection of the data, communication and 480 volt power to the equipment site and equipment lighting and all ducting, conduits and interfacing breakers and cabling and concrete pad for the 1600kW landfill gas fueled power engine generator. The estimated cost for this project is approximately $4.2 million in 2012 dollars.

Headworks Scum Concentrators

This project will evaluate different methods to prevent scum from adhering to the scum storage tanks. Due to the adhesion of the scum to the storage tanks, scum pumping process is hampered, requiring the operation staff to manually flush the scum tanks. The estimated cost for this project is approximately $0.06 million in 2012 dollars.

Utility Trench Cover Replacement

The utility trench covers are made of very heavy one-foot thick reinforced concrete and are difficult to remove without a crane or a forklift, thus making it difficult to gain immediate access to the trench. Originally, these covers were designed to handle H2 traffic loading. However, the O&M staff believes that the design was excessive and should be revisited. The NCWRP staff has recommended that the existing covers (at least partially) should be replaced with lighter covers that can be removed without difficulty. The traffic load design for the covers has to be reevaluated and maybe changed. This project will be done by EPM. The estimated cost for this project is approximately $0.09 million in 2012 dollars.

Primary Effluent Channel Mixers

This project will provide more energy efficient mixing at the Primary effluent channels. The estimated cost for this project is approximately $0.05 million in 2012 dollars.

Vault Drainage System Implementation

This project will provide adequate drain system to prevent potential flooding and damage of mechanical including electrical equipment. The estimated cost for this project is approximately $0.20 million in 2012 dollars.

Grit Piping Y-Access Ports

This project will entail the installation of Y-access ports (cleaning ports) to improve pipe cleaning. Due to adhesive nature of grit, it tends to plug and obstruct the existing 4-inch discharge piping of the grit piping to allow flushing to take place. The estimated cost for this project is approximately $0.06 million in 2012 dollars.

Butterfly Valve Upgrade

This project is to upgrade the 24-inch butterfly valve to 48-inch. The existing 24-inch is incapable of carrying the projected 2010 reclaimed water flow of 15 mgd. The estimated cost for this project is approximately $0.05 million in 2012 dollars.