

## SECTION 2

### INTRODUCTION

#### 2-1 PURPOSE

This section provides an overview and outline for the City of Manhattan Beach (City) Wastewater Master Plan. A brief background description, objectives and scope of work, acknowledgments, and a list of abbreviations used throughout the report are provided.

#### 2-2 CITY HISTORY AND BACKGROUND

Included in a land grant from Mexico, the Rancho Sausal Redondo consisted of approximately 22,500 acres, including the present site of the City of Manhattan Beach. In 1888, the Santa Fe Railroad laid tracks from Redondo Beach Wharf to Downtown Los Angeles, passing through what is now Manhattan Beach. By the early 1900's, railroad tracks were also installed along the ocean front through the area. As the area became more accessible through the railroad transportation, development began to increase.

Manhattan Beach was initially regarded as a place to vacation. Visitors often rented beach cottages or pitched tents; however, there were very few houses for permanent residency. When incorporated on December 7, 1912, Manhattan Beach had roughly 600 permanent residents. After World War II, many servicemen settled in the City to take advantage of the warm climate. Rapid growth during this period is also attributed to the development of the defense industry which brought an influx of people to the area. Much of the land east of Sepulveda Boulevard was developed to house the people coming to live and work there.

Currently, the City covers approximately 3.9 square miles of land that is almost completely developed. The majority of the land use is residential. Commercial areas are located along Highland Avenue, Manhattan Beach Boulevard, Sepulveda Boulevard, and in the Manhattan Village, which is located south east of Rosecrans Avenue and Sepulveda Boulevard. Industrial uses primarily consist of Northrop Grumman and Raleigh Studios, which are located northwest of Aviation Boulevard and Marine Avenue. According to the City's 2007-2008 Comprehensive Annual Financial Report, the largest employers within the City include the Target Corporation, Sketchers USA Inc., Kinecta Federal Credit Union, the City of Manhattan Beach, and Macy's West LLC. The California Department of Finance estimated that the City had a population of 36,718 in 2009.

#### 2-3 PREVIOUS STUDIES AND WORK COMPLETED

##### Wastewater System Master Plan (1994)

The City's last Wastewater System Master Plan was prepared in 1994 by Kennedy/Jenks Consultants. It analyzed the wastewater collection and pumping system to provide service through a planning period that extended to the year 2010. The City's year 1990 population was approximately 32,023.

The 1994 Wastewater System Master Plan included hydraulic analysis of all pipes over 8-inches in diameter. Of those analyzed, only two pipes were identified to be hydraulically inadequate. Video inspections were completed in the "Sand" and "Tree" sections of the City and the facilities were found to be in good condition. An ongoing rehabilitation program was recommended at an estimated annual cost of \$250,000.

The pumping system was found to require the most immediate attention. It was recommended that pumps and motors be replaced at six of the primary pump stations. Replacement of the natural gas engines with dedicated generator sets; replacement of dry well ventilation; rehabilitation of pump station wiring, main breakers, starters, and disconnect switches; and conversion of analog alarm SCADA system to digital was also recommended for each station. The total pump station improvement costs were estimated at \$707,500.

### Pump Station Improvements

Five wastewater pump stations were rehabilitated in 1998. These included Pacific Avenue Pump Station, Palm Avenue Pump Station, Meadows Avenue Pump Station, Voorhees Avenue Pump Station, and Bell Avenue Pump Station. Pumps and motors were replaced at each station. Diesel fueled generator sets were installed in the dry wells or on site. Ventilation and SCADA systems were also upgraded.

## **2-4 OBJECTIVES AND SCOPE OF WORK**

The objective of this Wastewater Master Plan is to evaluate the City's sewer collection system to provide a framework for undertaking the construction of new and replacement facilities for the service area in an efficient and cost effective manner. As a planning document, it is general in nature and is predicated upon the best information available at this time.

The scope of work for the Manhattan Beach Wastewater Master Plan consists of the following tasks:

### **1. Data Collection and Modeling Review**

The primary sources of information used during the course of this study are:

- GIS database information (parcels, land use, zoning, street centerlines, sewers)
- Sewer as-built drawings
- 1994 Wastewater System Master Plan Report and data
- City operation, maintenance, inspection, and repair records
- City sewer code requirements
- General Plan, zoning map and regional planning documents
- 1994 Water System Master Plan Report
- Aerial Photographs
- Regional facility plans
- Water meter records
- Facility visits

- City staff interviews
- 2' ground contour elevation data
- Field survey data
- Closed Circuit Television (CCTV) written reports and recordings
- Pump Station SCADA data
- Flow monitoring data

## **2. Development Patterns**

System wastewater flows (loads) were developed based upon existing land use information and developed unit flow factors.

## **3. Sewer Use Ordinances**

A Fats, Oils, and Grease (FOG) Program was developed to comply with the Statewide General Waste Discharge Requirements

## **4. Sewer Main Cleaning and Inspection**

Forty-four (44) miles of sewer pipes and associated manholes were cleaned and CCTV inspected. All inspections were conducted in accordance with the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) standards.

## **5. Engineering Evaluation**

A computer hydraulic model consisting of all City sewer pipes (excluding laterals and private lines), manholes, pump stations, force mains, large point source flows, and tributary area boundaries was created to analyze the capacity of the existing wastewater system. Unit flow factors were developed based upon flow monitoring data and water use information. Flow monitoring data was also utilized for calibrating the hydraulic model. Rainfall data was collected in an attempt to develop wet weather peaking criteria.

CCTV inspection reports and recordings were reviewed to identify and prioritize the condition deficiencies of the inspected system. A rehabilitation and replacement plan was then formulated.

## **6. Repair and Rehabilitation Alternatives Evaluation**

Traditional and trenchless technology methods for upgrade, repair and rehabilitation of the deficient sewers and manholes were evaluated.

## **7. Performance Indicators**

System criteria and useful lives were developed to establish measurable performance indicators for the wastewater system facilities.

## **8. GIS Update**

The City's Sewer Geographic Information System (GIS) was developed from georeferenced scanned drawings. Data captured during this process included pipe diameter, slope, and material; manhole

numbers, rim elevation, and invert elevation; junction structures, transition structures, plugs, and lift stations; offset reference, direction, and distance; plan numbers; date of construction; facility location; flow direction; and link to CCTV video files. A wastewater atlas map book was also created.

#### **9. Pumping System Analysis**

A thorough field review of each pump station was conducted. Information collected in the field along with construction plans, SCADA data, pump curves, specifications, and maintenance records were used to analyze the pump capacities, emergency and operating storage of the wet wells, equipment conditions, and structural conditions.

#### **10. Rating System and Capital Improvement Program**

The hydraulic analysis, the structural rehabilitation analysis and the pumping system analysis formed the basis of the City's Wastewater Capital Improvement Program. The projects were prioritized with the highest priorities given to deficiencies that may fail and cause overflows.

#### **11. Cost Estimates**

Cost estimates for all recommended improvement projects and wastewater system programs were formulated. The replacement value of the entire wastewater system was also developed.

#### **12. Wastewater Master Plan Document**

This Wastewater Master Plan report summarizes the work conducted and the results of the study.

### **2-5 STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS**

The State Water Resources Control Board (SWRCB), which oversees all wastewater permitting and enforcement, adopted Resolution 2004-80 requiring staff to work with stakeholders in developing a regulatory program that will provide a consistent approach for reducing sanitary sewer overflows (SSOs). To assist in the development of the regulatory program, a statewide SSO Guidance Committee composed of representatives from the Regional Water Quality Control Boards, county environmental health departments, environmental groups, U.S. EPA, local public collection system owners and other collection system experts was formed. SWRCB staff and the SSO Guidance Committee drafted the Statewide General Waste Discharge Requirements (WDR) for Sewage Collection System Agencies.

The State Water Resources Control Board adopted the Statewide General Waste Discharge Requirements for sanitary sewer systems and the associated monitoring and reporting program by issuing Order No. 2006-0003 on May 2, 2006.

The WDR and reporting program address SSO reporting and proper collection system management and operation necessary to protect public health, water quality, and the public's investment in the sewer system infrastructure.

The Statewide WDR is essentially California's equivalent of the proposed Federal regulation, Capacity, Management, Operation, and Maintenance (CMOM), and includes all elements of CMOM. The fifth paragraph of the preamble to the Waste Discharge Requirements is:

“To facilitate proper funding and management of sanitary sewer systems, each Enrollee must develop and implement a system-specific **Sewer System Management Plan (SSMP)**. To be effective, SSMPs must include provisions to provide proper and efficient management, operation, and maintenance of sanitary sewer systems, while taking into consideration risk management and cost benefit analysis. Additionally, an SSMP must contain a spill response plan that establishes standard procedures for immediate response to an SSO in a manner designed to minimize water quality impacts and potential nuisance conditions.”

The Sewer System Management Plan must address the following elements:

- Goals
- Organization Structure
- Legal Authority
- Operation and Maintenance Program, including a Preventive Maintenance Program and a Rehabilitation and Replacement Program (*Completed as a part of this Master Plan*)
- Design and Performance Provisions
- Overflow Emergency Response Plan
- Fats, Oils, and Grease (FOG) Control Program (*Completed as a part of this Master Plan*)
- System Evaluation and Capacity Assurance Plan (*Completed as a part of this Master Plan*)
- Monitoring, Measurement, and Program Modifications
- Sewer System Management Plan Program Audits
- Communication Program

The completion schedule varies by the population of the service area. For a collection system agency such as the City of Manhattan Beach, with a population between 10,000 and 100,000 full compliance was required by August 2, 2009.

Enrollees are required to certify that the final SSMP and its constituent subparts are in compliance with the WDR. Enrollees are also required to obtain their governing board’s approval of the SSMP Development Plan and Schedule and final SSMP at a public hearing prior to certification as complete and in compliance. Enrollees do not send their SSMP to the State or Regional Water Boards for review or approval; but, need to make them available upon request.

## **2-6 FUTURE REGULATIONS – CAPACITY, MANAGEMENT, OPERATIONS AND MAINTENANCE (CMOM)**

Concerned over the disturbing trend of frequent and large sanitary sewer overflows (SSOs), their environmental and health impacts, and the condition of the infrastructure, President Clinton directed the Environmental Protection Agency (EPA) on May 29, 1999 to develop, within one year, new national regulations to prevent sanitary sewer overflows. Since directed, the EPA worked to develop draft National Pollutant Discharge Elimination System (NPDES) regulations for sanitary sewers and sanitary sewer overflows (SSOs).

The purpose of the proposed regulation is to improve collection systems' capacity, management, operation and maintenance (CMOM) programs, prevent avoidable sewer spills, improve treatment facility performance, and reduce health and environmental risks.

Under the proposed regulations, an NPDES permit is required for all publicly-owned collection systems, and the following general standards must be implemented:

- Proper management, operation and maintenance
- Adequate capacity to convey base flows and peak flows
- Stop and mitigate the impact of sanitary sewer overflows
- Provide notification of sewer spills to parties exposed to pollutants
- Develop a written summary of the CMOM program and make it, with audits, available to the public upon request

The components of the CMOM program consist of:

1. **Goals:** Specifically identify the major goals of the CMOM program, consistent with the general standards.
2. **Organization:** Identify:
  - a. Positions responsible for implementing the CMOM program
  - b. Chain of communication for reporting SSOs to the NPDES authority and, where appropriate, the public
3. **Legal Authority:** Include legal authority through sewer use ordinances, service agreements or other legally binding documents to:
  - a. Control infiltration and connections from inflow sources
  - b. Require that sewers and connections be properly designed and constructed
  - c. Ensure proper installation, testing, and inspection of new and rehabilitated sewers
  - d. Address flows from municipal satellite collection systems
  - e. Implement prohibitions of the national pretreatment program
4. **Measures and Activities:**
  - a. Provide adequate maintenance facilities and equipment
  - b. Maintain a map of the collection system (*Completed a part of this Master Plan*)
  - c. Information management to properly prioritize CMOM activities and to identify trends in overflow
  - d. Routine preventive operation and maintenance activities
  - e. Capacity assessment (*Completed as part of this Master Plan*)

- f. Identification and prioritization of structural deficiencies
  - g. Regular training and inventory of equipment and replacement parts
5. **Design and Performance Provisions:** Establish:
- a. Requirements and standards for new pipes, laterals, as well as for rehabilitation and repair
  - b. Procedures and specifications for inspecting and testing the installation of new sewers, pumps, and other appurtenances, and for rehabilitation and repair projects
6. **Monitoring, Measurement and Program Modifications:**
- a. Monitor implementation and measure the effectiveness of each element of the program
  - b. Update program elements as appropriate
  - c. Modify the CMOM Plan as appropriate
7. **Overflow Emergency Response Plan:** Identify measures to protect public health and the environment by developing and implementing a plan with mechanisms to:
- a. Ensure awareness of overflows
  - b. Ensure appropriate rapid response, including notification
  - c. Identify all public health and regulatory officials who will need to be notified
  - d. Ensure plan is understood and followed, and that personnel are trained
  - e. Provide emergency operations
8. **System Evaluation and Capacity Assurance Plan:**
- a. Evaluate system for hydraulic capacity and identify deficiencies (*Completed as part of this Master Plan*)
  - b. Prioritize and schedule system upgrades
  - c. Monitor performance of upgrade measures
  - d. Keep CMOM Plan updated
9. **CMOM Program Audits:** Submit an audit report as part of the NPDES application. The audit must evaluate the compliance of the agency with its own CMOM Plan and address the deficiencies and steps taken to respond to them. The audit, along with the Plan, must be made available to the public upon request.

At the end of March, 2000, EPA sent a draft notice of proposed rulemaking (NPRM) to the Office of Management and Budget (OMB) for review, which reflected the recommendations of the SSO Federal Advisory Subcommittee that were provided in October 1999.

The Office of Management and Budget reviewed the proposed regulations and approved it for publication in the Federal Register in January 2001. However, the Bush administration decided to review the proposed regulations prior to official publication.

Throughout 2001, the public and the wastewater collection/treatment community sent letters to the EPA expressing concern with the regulatory language of the proposal and urging the agency to work with affected entities to develop a more sensible, workable proposal.

In November 2001, the Assistant Administrator for Water instructed the Office of Wastewater Management (OWM) to develop a new SSO/CMOM Proposed Rule that will:

- Summarize key comments from the public on the January 2001 draft notice
- Provide additional discussion on how the public's comments related to the proposed provisions
- Provide comments on potential alternatives

CMOM was ready to be published in the Federal Register in 2001 for the 120 day comment period. However, since the change of Administration at that time, adoption of the proposed regulation has not been pursued.

Currently, there is no change in the status of the SSO Proposed Rule, which contained CMOM. It was never moved for publication in the Federal Register nor adopted during the Bush administrations and there has been no publication action to date by EPA.

In lieu of publishing the SSO Rule, the EPA published a guidance document in 2005 that contains most of what was in the original SSO Rule concerning CMOM. The guidance document is entitled "Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems".

## **2-7 GOVERNMENT ACCOUNTING STANDARDS BOARD STATEMENT 34 (GASB 34)**

Government Accounting Standards Board Statement 34 (GASB 34), issued in June 1999, requires that agencies have an asset management system in place. They must establish the condition in which they will maintain their assets, assess the condition of their infrastructure, estimate the useful lives and replacement costs, and determine the cost to maintain the desired condition of the infrastructure. Section I, Background, of the proposed CMOM regulations acknowledges GASB 34, and the regulations encompass many of the components of GASB 34. Complying with Statement 34 will provide agencies with the necessary tools for maintaining the integrity of their assets and will most likely improve their bond rating.

## **2-8 ORGANIZATION OF WASTEWATER MASTER PLAN REPORT**

This Wastewater Master Plan report presents the methodology, findings, and recommendations of a comprehensive study of the City of Manhattan Beach sewer collection system. A brief outline of the report follows:

**Section 1: Executive Summary** provides an overview of the key findings and recommendations of this report

- Section 2: Introduction** provides an overview and outline for the Wastewater Master Plan.
- Section 3: Study Area** describes the physical features, land use characteristics and population of the study area.
- Section 4: Criteria** describes the standards and procedures utilized in developing the wastewater flows, assessing the existing system, and selecting the recommended improvements.
- Section 5: Existing Wastewater Collection System** describes the City's existing sewer collection system, drainage regions, and the regional facilities that will receive flows from the study area. 'Hot Spots' and maintenance practices are discussed.
- Section 6: Existing Pump Stations** describes and analyzes the condition and capacities of the City's existing sewage pump stations.
- Section 7: Hydraulic Sewer Model** describes the methodology used in the construction of the City's hydraulic sewer model. This section describes the base data and assumptions used in detail.
- Section 8: Hydraulic System Analysis** describes the results of the hydraulic analyses, and identifies the hydraulically deficient segments of the system.
- Section 9: Gravity System Condition Assessment** describes the condition of the sewer collection system based on CCTV inspections.
- Section 10: Capital Improvement Program** presents a prioritized capital improvement program for the recommended projects.

The **Appendices** (CD Insert) contain background information and are referred to in the text as the location of supplementary facts and figures.

**2-9 ACKNOWLEDGMENTS**

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**2-10 ABBREVIATIONS**

To conserve space and improve readability, abbreviations have been used in this report. Each abbreviation has been spelled out in the text the first time it is used. Subsequent usage of the term is usually identified by its abbreviation. The list of abbreviations utilized in this report is contained in Table 2-1.

**Table 2-1  
Abbreviations**

<b>Abbreviations</b>	<b>Explanation</b>
AC, Ac	Acres
ACP	Asbestos Cement Pipe
ADWF	Average Dry Weather Flow
amsl	Above Mean Sea Level
BMP	Best Management Practices
CCTV	Closed Circuit Television
cfs	Cubic Feet per Second
CI	Cast Iron Pipe
CIP	Capital Improvement Program
City	City of Manhattan Beach
CMOM	Capacity, Management, Operation and Maintenance
CWEA	California Water Environment Association
d/D	Depth to Diameter Ratio
Dia	Diameter
DIP	Ductile Iron Pipe
DU, du	Dwelling Unit
D/S	Downstream
EDU	Equivalent Dwelling Unit
EPA	Environmental Protection Agency
FAR	Floor Area Ratio
FOG	Fats, Oils, and Grease
ft	Feet
fps	Feet per Second
GASB 34	Government Accounting Standards Board Statement 34
GIS	Geographic Information System
gpcd	Gallons per Capita per Day
GPD, gpd	Gallons per Day
gpm	Gallons per Minute
HP	Horsepower
ID	Identification
I/I	Inflow and Infiltration
in	Inches
LACSD	Los Angeles County Sanitation District
LF	Lineal Feet
Mat	Material
mg	Million Gallons
MGD, mgd	Million Gallons per Day
MH	Manhole
NASSCO	National Association of Sewer Service Companies
NCPI	National Clay Pipe Institute
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
OMB	Office of Management and Budget
OSHA	Occupational Safety & Health Administration
OWM	Office of Wastewater Management
PACP	Pipeline Assessment and Certification Program
PDWF	Peak Dry Weather Flow
PMP	Preventative Maintenance Program
PS	Pump Station
PVC	Polyvinyl Chloride
PWWF	Peak Wet Weather Flow

**Table 2-1 (Continued)**  
**Abbreviations**

<b>Abbreviations</b>	<b>Explanation</b>
RPM	Revolutions per Minute
RWQCB	Regional Water Quality Control Board
SAMP	Sub-Area Master Plan
SSES	Sanitary Sewer Evaluation Survey
SSMP	Sewer System Management Plan
SSO	Sanitary Sewer Overflow
SWRCB	State Water Resources Control Board
TDH	Total Dynamic Head
TSF	Thousand Square Feet
UFF	Unit Flow Factor
U/S	Upstream
USGS	United States Geological Survey
VCP	Vitrified Clay Pipe
WDR	Waste Discharge Requirements