

Section 2

INTRODUCTION

2-1 PURPOSE

This section provides an overview and outline for the City of Ontario (City) Old Model Colony Sewer 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

The City of Ontario was incorporated on December 10, 1891 with a population of about 683. It is one of California's first planned communities that was first developed as an agricultural community largely devoted to citrus fruits. The production of peaches, walnuts, lemons, and grapes also played an important role in the growth of Ontario. Latimer Field was established by airplane enthusiasts in 1923. From then on, the area became increasingly aviation conscious. Urban growth pushed the aviators further east to the present location of Ontario International Airport, which was used as a training center for pilots during World War II.

Since World War II, Ontario has become a much more diversified community. The population steadily grew by approximately 20,000 every ten years from 1950 to 1980. From 1980 to 1990, the population jumped from 88,820 to 133,179. Ontario has been one of Southern California's fastest growing cities for more than 25 years.

Today, Ontario is a full service city with a population exceeding 172,000. It consists of approximately 50 square miles of residential, commercial, and industrial areas. The economy now reflects a large industrial and manufacturing base. Residents enjoy the mild Southern California climate as well as the many available amenities in and around the Los Angeles area.

Anticipated growth is expected to add 120,000 plus people as substantial residential development begins in the 8,200 acre New Model Colony (*Ref: City Economic Development website*).

2-3 PREVIOUS STUDIES AND WORK COMPLETED

1995 Sewer Master Plan

The City's latest Master Plan was prepared in 1995 by Kennedy/Jenks Consultants. It analyzed the system based upon a City service area that was approximately 70 percent developed.

Some of the average flow factors used in the study was as follows:

270 gpd/du for single family residential uses with densities from 0-10 du/ac

330 gpd/du for single family residential uses with densities greater than 10 du/ac

270 gpd/du for condominiums and apartments

- 150 gpd/du for mobile homes
- 2,200 gpd/ac for commercial uses
- 4,700 gpd/ac for industrial uses
- 3,500 gpd/ac for schools and institutional/government uses
- 200 gpd/ac for public parks and agriculture

The dry weather peaking formula used was $Q_{\text{peak(mgd)}} = 1.8 * Q_{\text{ave(mgd)}}^{-0.07}$. A contingency for inflow and infiltration was provided by reserving ten percent of the collection system's capacity. The depth to diameter criteria implemented was peak dry weather flow shall not exceed 75 percent of the design capacity of the pipeline or a total depth to diameter ratio of 0.64.

Approximately 102,400 feet of sewers were identified as under capacity to meet future flow conditions. Replacement of these pipelines was recommended at a cost of \$15.5 Million. It was also recommended to video inspect and rehabilitate the existing facilities constructed before 1930 at a cost of \$10.85 Million. Additionally, an ongoing sewer rehabilitation program and video inspection program was recommended.

Four of the City's then existing six pump stations (Whispering Lakes, Archibald/Riverside, Archibald Ranch, and Magnolia Avenue) were found to have inadequate pumping capacity to meet future flow conditions. It was recommended to reconstruct the Whispering Lakes, Archibald/Riverside, Archibald Ranch, and Magnolia Avenue pump stations at a cost of \$4.2 Million. It was also recommended that the City convert the existing telemetry system from a status monitoring system to an operational control system of all the pump stations at a cost of \$150,000.

Since the 1995 Master Plan, the City has implemented some flow diversions and the first phase of an improvement project along Holt Boulevard.

2000 Sphere of Influence Sewer Master Plan, 2001 New Model Colony Sewer Master Plan, 2005 Sewer Master Plan Alternatives Analysis

These documents were prepared by AKM Consulting Engineers. They evaluated the sewer service needs of the New Model Colony as well as the feasibility of eliminating five existing sewer pump stations that served the southerly portion of Old Model Colony.

As a result of these studies, it was recommended that the City pursue the construction of the Eastern Trunk Sewer, Western Trunk Sewer, and Haven Avenue Trunk Sewer at increased sizes to accommodate not only the New Model Colony flows, but also the Old Model Colony flows resulting from the removal of five of the existing City sewer pump stations. An alternative was proposed to eliminate Archibald Ranch, Haven, Riverside/Archibald, Turner, and Whispering Lakes Pump Stations from the Old Model Colony sewer system. The flow tributary to these pump stations would be diverted to New Model Colony sewers, which would convey the flow south to the IEUA Kimball Interceptor.

2003 Sewer Pump Station Improvements and Removals

A study of the City's sewer pump stations was conducted in 2003 by AKM Consulting Engineers. This study developed more detailed flow and condition data for each pump station, upon which a phasing plan was based for the necessary improvements and pump station elimination projects.

Since 2003, the City and IEUA worked jointly to have the Eastern Trunk Sewer designed and constructed. The Eastern Trunk Sewer size was increased to allow IEUA the ability to bypass RP-1 and convey some of the tributary flows to RP-5 through Kimball Interceptor. At the same time, the City abandoned four sewer pump stations and diverted its tributary flows to the Eastern Trunk Sewer. The abandoned pump stations included Archibald Ranch, Riverside/Archibald, Turner, and Whispering Lakes. Haven Pump Station is still in operation. It can not be eliminated until the facilities in Haven Avenue and Merrill Avenue are constructed and tied to the Eastern Trunk Sewer in Archibald Avenue.

Most of the tributary flows to the Magnolia Pump Station were diverted to IEUA's Montclair Interceptor through two new connections: one at Oaks Avenue and one at Magnolia Avenue.

2003 Sewer Atlas Books

The City sewer data was converted into a new sewer GIS database and atlas books in 2003. The sewer data was captured from four sources including improvement plans, hand-drafted atlas maps, the existing sewer GIS data (from the 1995 Master Plan), and field reviews. The sewer GIS based atlas book is updated regularly as additional data, corrections and new projects are identified.

2-4 OBJECTIVES AND SCOPE OF WORK

The objective of this 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 Old Model Colony Sewer Master Plan consists of the following tasks:

- 1. Provide Project Management, Communication and Meetings**
- 2. Data Collection and Modeling Review**

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

- GIS database information (parcels, land use, zoning, street centerlines, sewers)
- Sewer atlas maps
- Sewer as-built drawings
- 1995 Sewer Master Plan Report and data
- Sanitary sewer flow monitoring records
- City operation, maintenance, inspection, and repair records

- City sewer code requirements
- 1987 General Plan, zoning map and regional planning documents
- 1998 Sphere of Influence General Plan Amendment
- 2006 Water and Recycled Water System Master Plan
- Aerial Photographs
- Regional facility plans
- Water meter records
- Facility visits
- City staff interviews
- Survey data

3. Hydraulic Sewer System Model Development and Sewer Model Calibration

The sewer GIS, supplemented by data from the 1995 Sewer Master Plan, was used as the basis of the hydraulic model geometry. The model includes all City sewer pipes (excluding stub-outs, laterals and private lines), manholes, pump stations, large point source flows, and tributary area boundaries. The model was developed utilizing MWH Soft's H2OMap Sewer software.

Unit flow factors and a dry weather peaking relationship were developed from flow monitoring conducted during this study. The flow monitoring results were also used to calibrate the model. Water meter records were utilized to identify high water users and estimate an appropriate sewage load to be added to the hydraulic model. Water meter records were also used to develop unit flow factors for areas where the land use could not be isolated by a flow meter.

4. Flow Monitoring

Flow monitoring locations were selected to develop unit flow factors for land uses with large tributary areas that could be isolated with monitors. Other locations were selected for model calibration purposes and to quantify upstream flow diversions/splits. A total of sixteen (16) monitors were installed throughout the City and collected data for two weeks each. The monitoring period did not capture any wet weather flow data.

5. Sewer Model System Analyses

The hydraulic model was used to analyze and evaluate the capacity of the existing system and the system with improvements, for the ultimate land use based on the built-out condition of the General Plan. Three model conditions were run as follows:

1. Calibration Scenario with existing system, current land use and flow conditions, showing and proving areas of adequacy
2. Ultimate Scenario with existing system, ultimate build-out land use and flow conditions, showing deficiencies and proving areas of adequacy
3. Ultimate Scenario with fully improved system, ultimate build-out land use and flow conditions,

6. Sewer Master Plan Update

The capital improvement program was developed based upon the hydraulic model analyses.

The work effort and results are presented in this Master Plan Report. It includes documentation on the methodology throughout the project to create the sewer system hydraulic model. It also includes an existing sewer system description, recommended criteria, analysis results, a recommended capital improvement program, and maintenance program recommendations.

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 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 Statewide General Waste Discharge Requirements (WDR) for Sewage Collection System Agencies.

The State Water Board adopted the Statewide General Waste Discharge Requirements (WDR) 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 addresses 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 proposed completion schedule varies by the population of the service area. For a collection system agency with a population greater than 100,000, the proposed full compliance schedule is currently set at 36 months after the WDR adoption. 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 proposed 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
- Design and Performance Provisions
- Overflow Emergency Response Plan
- Fats, Oils, and Grease (FOG) Control Program
- 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

As currently planned, the following submittal schedules will apply to the City of Ontario (population greater than 100,000):

- | | |
|---|------------------|
| ▪ Application for Permit Coverage | November 2, 2006 |
| ▪ Reporting Program | November 2, 2006 |
| ▪ SSMP Development Plan and Schedule | August 2, 2007 |
| ▪ Goal | November 2, 2007 |
| ▪ Organization Structure | November 2, 2007 |
| ▪ Overflow Emergency Response Program | November 2, 2008 |
| ▪ Legal Authority | November 2, 2008 |
| ▪ Operation and Maintenance Program | November 2, 2008 |
| ▪ Fats, Oils and Grease Control Program | November 2, 2008 |
| ▪ Design and Performance | May 2, 2009 |
| ▪ System Evaluation and Capacity Assurance Plan | May 2, 2009 |
| ▪ Monitoring and Program Modifications | May 2, 2009 |
| ▪ Program Audits | May 2, 2009 |
| ▪ Communication Program | May 2, 2009 |
| ▪ Final Sewer System Management Plan | May 2, 2009 |

Enrollees are required to certify that the final SSMP and its constituent subparts are in compliance with the Sanitary Sewer Order within the time frame above. 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.

It is currently not known how the regulation and permitting process will be implemented. However, compliance with the Statewide WDR will bring the City into compliance with CMOM.

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 acknowledge 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 SEWER MASTER PLAN REPORT

This Sewer Master Plan report presents the methodology, findings, and recommendations of a comprehensive study of the City of Ontario's Old Model Colony 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 Sewer 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 future wastewater flows, assessing the existing system, and selecting the recommended improvements.

Section 5: Existing Sewer Collection System describes the City's existing sewer collection system, drainage regions, and the regional facilities that will receive flows from the study area.

Section 6: Hydraulic Sewer Model describes the methodology used in the construction of the City's hydraulic sewer model. Base data and assumptions used are described in detail this section.

Section 7: System Analysis describes the hydraulic model and identifies the hydraulically deficient segments of the system. Condition assessment of the sewer collection system, 'hot spots' and maintenance practices are also discussed.

Section 8: Capital Improvement Program presents a prioritized, capital improvement program for the recommended projects.

The **Appendices** 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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Ryan Bengsch, Assistant Engineer

Ivan Sanchez, Engineering Assistant/GIS

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

Abbreviations	Explanation
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 Ontario
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, Oil, and Grease
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
IEUA	Inland Empire Utilities Agency
I/I	Inflow and Infiltration
LF	Lineal Feet
Mat	Material
mg	Million Gallons
MGD, mgd	Million Gallons per Day
MH	Manhole
NCPI	National Clay Pipe Institute
NMC	New Model Colony
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
OMC	Old Model Colony
OSHA	Occupational Safety & Health Administration
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

Abbreviations	Explanation
RFP	Request for Proposal
RP	Regional Plant
RPM	Revolutions per Minute
SAMP	Sub-Area Master Plan
SBC	San Bernardino County
SSO	Sanitary Sewer Overflow
SSMP	Sewer System Management Plan
SWRCB	State Water Resources Control Board
TDH	Total Dynamic Head
TSF	Thousand Square Feet
UFF	Unit Flow Factor
U/S	Upstream
VCP	Vitrified Clay Pipe
WDR	Waste Discharge Requirements