Section 2

INTRODUCTION

2-1 Purpose

This section provides an overview and outline for the City of Ontario (City) Sewer Master Plan Update. The intent of this study is to update the Sewer Master Plan with the 2010 General Plan information as well as consolidate the 2007 New Model Colony Sewer Densification Study and the 2008 Old Model Colony Sewer Master Plan into one report. 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 initially 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.

Wanting to cash in on the postwar boom, the City began efforts to recruit business and industry to the area. Rapid growth during this period began the City's transformation from an agricultural giant to a community of light industry and housing. Today, almost all of the citrus groves and vineyards are gone. The remaining form of agriculture is dairy farming, which is holding out on the southern outskirts of the City. As part of a 14,000 acre agricultural preserve, approximately 8,200 acres of this area is within the City of Ontario's Sphere of Influence (SOI), now referred to as the New Model Colony (NMC).

Agricultural industries, predominantly dairy farms, occupy approximately 98 percent of the NMC. The population grew steadily from 1950 through 1990 with an increase in housing units from 110 to 789. At the time of the 1990 census, the vacancy rate within the NMC was 37 percent (1998 City of Ontario SOI General Plan).

Today, Ontario is a full service city with a population exceeding 174,000. 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 more than double the population to an estimated 358,270 as substantial residential development begins in the 8,200 acre New Model Colony (*Ref: 2010 General Plan*).

2-3 Previous Studies and Work Completed

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

These documents evaluated the sewer service needs of New Model Colony, as well as the feasibility of eliminating five existing sewer pump stations that served the southerly portion of Old Model Colony (OMC).

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's Kimball Interceptor Sewer.

2003 Phasing of 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 Sewer. At the same time, the City abandoned the Archibald Ranch, Riverside/Archibald, Turner, and Whispering Lakes Pump Stations, and diverted their tributary flows to the Eastern Trunk Sewer. Haven Pump Station is still in operation. It cannot be eliminated until the facilities in Haven Avenue and Merrill Avenue are constructed and tied to the Eastern Trunk Sewer on 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.

2006 New Model Colony Sewer Master Plan Addendum and 2007 New Model Colony Sewer Densification Study

These documents updated the sewer evaluation of New Model Colony with the current land use information, pump station flow information, pump station diversions, and planned pipe alignments. Cost estimates were made for interim and ultimate facilities. Violations of the "Cooperative Agreement for the Sewer Conveyance Facilities of the Eastern Trunk Sewer, Kimball Interceptor, Sewer Extension, and RP-1 Outfall" between the City and the Inland Empire Utilities Agency (IEUA) were identified. IEUA's Kimball Interceptor was added to the hydraulic analysis to evaluate its capacity from Baker Avenue west to Regional Plant No. 5 (RP-5).

2008 Old Model Colony Sewer Master Plan

This document was prepared to evaluate the existing collection system in Old Model Colony. At the time of the study, the total estimated existing and ultimate loads were 13.8 mgd and 30.1 mgd, respectively. The sewer network consisted of 365.7 miles of gravity pipe, 7582 manholes and 3 pump stations with 11,588 feet of forcemains. The OMC sewer system was analyzed based on available GIS data, flow monitoring studies, and water use records.

Approximately 47,236 feet of pipe was deemed capacity deficient based on the peak dry weather criteria of d/D>0.64. Among these hydraulically deficient pipes, 41,477 feet was recommended improvement at an estimated cost of \$45.7 million. Additionally, CCTV inspection and condition assessment were included in the Capital Improvement Program at a cost of \$3.86 million over four years.

Holt Boulevard Trunk Sewer

Since the completion of the 2008 OMC Sewer Master Plan, the Holt Boulevard Trunk Sewer has been constructed in Holt Street between Cucamonga Avenue and a point located west of Cypress Avenue. The Holt Boulevard Trunk Sewer will ultimately intercept sewage flows north of Holt and divert it east to the existing IEUA Upland Interceptor Relief in Cucamonga Avenue.

Brooks Street Sewer Replacement

The Brooks Street Sewer Replacement has been designed to alleviate flows to the existing Brooks Street sewer that was previously identified as hydraulically deficient in the Old Model Colony Sewer Master Plan. The existing sewer is also very shallow and is known to surcharge. In early 2010, the City had an overflow pipe constructed to an adjacent sewer in order to prevent future sanitary sewer overflows at this location. This overflow pipe was only intended to be a temporary solution.

The Brooks Street Sewer Feasibility Study was completed April 28, 2010. The purpose of the study was to:

- Examine the impact of constructing the designed Brooks Street Sewer Replacement project on the downstream sewers without the Hold Boulevard Trunk Sewer, Phase B in operation.
- Determine if the Brooks Street Sewer could be constructed before the Hold Boulevard Trunk Sewer was reconstructed.
- Evaluate alternate flow diversions to reduce the existing and ultimate flows in the existing Brooks Street Sewer and determine what effect the diversion would have on the downstream sewers.

As a result of the feasibility study, the City plans to implement two diversions in lieu of constructing the Brooks Street Sewer Replacement. The two diversions are as follows:

- > Manhole J10141 at Benson Avenue, north of Stoneridge Court all flows diverted south
- Manhole J11132 at Hollowell Street, between Mountain Avenue and Boulder Avenue all flows diverted south

These diversions were considered as existing when constructing and running the hydraulic analysis for this study.

2-4 Objectives and Scope of Work

The objective of this Master Plan is to evaluate the City's sewer collection system and 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 and New Model Colony Sewer Master Plan Update consists of the following tasks:

- 1. Reevaluate unit flow factors for Old Model Colony and New Model Colony based on newly defined densities and recent water consumption data
- 2. Reload the Old Model Colony and New Model Colony hydraulic models based on new landuse defined by the City's 2010 General Plan information
- 3. Develop detailed unit flow factors for mixed use areas and apply to the model manually
- 4. Rerun the analyses and identify any hydraulic deficiencies
- 5. Reevaluate Capital Improvement Program
- 6. Incorporate new results into one comprehensive Citywide Sewer Master Plan Document

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

The State Water 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-DWQ 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 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
- 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

The following completion schedules applied to the City of Ontario (population greater than 100,000):

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

Enrollees were required to certify that the final SSMP and its constituent subparts were in compliance with the Sanitary Sewer Order within the time frame above. Enrollees were 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 did not send their SSMP to the State or Regional Water Boards for review or approval; but, need to make them available upon request. The City of Ontario has completed each of the aforementioned elements of the required SSMP.

Currently, the SWRCB staff is conducting a review and update of the WDRs, Order No. 2006-003-DWQ. Program reviews and updates are conducted routinely to maintain consistency with current policies, regulations, and statutes. A revised order has been drafted and public comments were taken up until May 13, 2011. The SWRCB staff is now reviewing comments. It is expected that the final version of the order will be completed by the end of 2011.

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 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:

- ➢ Goals
- Organization Structure
- Legal Authority
- Measures and Activities
- > Design and Performance Provisions
- > Monitoring, Measurement and Program Modifications
- > Overflow Emergency Response Plan
- System Evaluation and Capacity Assurance Plan
- > CMOM Program Audits

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 OMB 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, the process was halted by the then-incoming Bush Administration so that the regulation could be reviewed.

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 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's 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 existing and future wastewater flows, assessing the existing system, and selecting the recommended improvements.
- Section 5: Existing Sewer 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: Ultimate Sewer System describes the City's ultimate sewer collection system, including New Model Colony.
- Section 7: 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 8:** 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 9:** 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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- Fernando Cobos, Utilities Project Manager
- 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.

Please also note that the terms "sewer" or "sewage" and "wastewater" are generally interchangeable throughout this report.

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		
Cl	Cast Iron Pipe		
CIP	Capital Improvement Program		
City	City of Ontario		
СМОМ	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		
ETS	Eastern Trunk Sewer		
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		

Table 2-1 (Continued) Abbreviations			
Abbreviations	Explanation		
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		
RFP	Request for Proposal		
RP	Regional Plant		
RPM	Revolutions per Minute		
SAMP	Sub-Area Master Plan		
SBC	San Bernardino County		
SBCFCD	San Bernardino County Flood Control District		
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		
WTS	Western Trunk Sewer		