APPENDIX M

Capacity Evaluation

Revision History			
Revision	**Date**	**Approval**	**Reason**
0	09/30/05		Original
1	04/24/09		•
2	04/15/11		•
3	09/14/12		•
4	03/26/14		•
5	10/08/14		•
6	11/14/16	E. Yong	• Updated status of the collection system capacity CIP projects; page 3
7	07/24/17	W. Smith	• Updated plan and Table M-1
8	07/20/18	W. Smith	• Updated page 3, paragraph 2: and Table M-1
9	07/11/19	J. Fenton	• Updated Plan and Table M-1
10	07/08/20	C. Falzone	• Updated Plan and Table M-1
11	09/21/21	T. Edwards	• Updated Plan and Table M-1; OCSD to OC San
12	09/19/22	T. Edwards	• Updated page 1 - paragraph 3, budget year, and Table M-1
13	09/22/23	T. Edwards	• Updated plan and Table M-1
14	09/19/24	T. Edwards	• Updated plan and Table M-1
15	03/11/25	EEC	• Update per WDR Order
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Orange County Sanitation District
System Evaluation and Capacity Assurance Plan

Overview

Orange County Sanitation District (OC San) System Evaluation and Capacity Assurance Plan (SECAP) follows the General Waste Discharge Requirements (WDR) sequentially; that is, each section of the SECAP is presented in the order of and corresponds to a specific sub-section in the WDR which allows the reviewer and auditor to easily reference the WDR for further information if necessary. The goal of the SECAP is to develop user-friendly documents for staff use, regulator use, and public review as required by the WDR order. More detailed information can be obtained from the individually referenced documents, but this submittal is designed to specifically identify how the requirements of Attachment D, Section 8 (a) System Evaluation and Condition Assessment, (b) Capacity Assessment and Design Criteria, (c) Prioritization of Corrective Actions, and (d) Capital Improvement Plan.

WDR Attachment D Section 8.1 System Evaluation and Condition Assessment:

Procedures to:

- *Evaluate the sanitary sewer system assets utilizing the best practices and technologies available;*
- *Identify and justify the amount (percentage) of its system for its condition to be assessed each year;*
- *Prioritize the condition assessment of system areas that:*
    - *o Hold a high level of environmental consequences if vulnerable to collapse, failure, blockage, capacity issues, or other system deficiencies;*
    - *Are located in or within the vicinity of surface waters, steep terrain, high groundwater elevations, and environmentally sensitive areas;*
    - *Are within the vicinity of a receiving water with a bacterial-related impairment on the most current Clean Water Act section 303(d) List;*
- *Assess the system conditions using visual observations, video surveillance and/or other comparable system inspection methods;*
- *Utilize observations/evidence of system conditions that may contribute to exiting of sewage from the system which can reasonably be expected to discharge into a water of the State;*
- *Maintain documents and recordkeeping of system evaluation and condition assessment inspections and activities; and*
- *Identify system assets vulnerable to direct and indirect impacts of climate change, including but not limited to: sea level rise; flooding and/or erosion due to increased storm volumes, frequency, and/or intensity; wildfires; and increased power disruptions.*

OC San Engineering Planning Division evaluates the capacity in the collection system every five to ten years and last completed a major model update as part of the 2019 Collections Capacity Evaluation Study Master Plan Update (2019 MPU) in 2020. The 2019 MPU and supporting model documentation outlines the updated steps and assumptions for the evaluation of the sewer collection system. This document includes the approach for estimating capacities, deficiencies, and a characterization of the flow components contributing to the sewer system for the years 2017 and 2040. The evaluation was done for dry weather and wet weather flow conditions. Assessments of inflow and infiltration for wet weather flow conditions were conducted as part of the evaluation. It should be noted that a 10-year design storm was utilized which reflects OC San's high level of service goals. The capacity model was calibrated using flow monitor data collected from November 2016 – May 2018. Where deficiencies were found, projects were prioritized and recommended for inclusion in OC San's capital improvement program. Where alleviation of hydraulic deficiencies has occurred (either from changing flow conditions or more accurate modeling results) projects were canceled and are no longer a part of OC San's capital improvement program (see Table M-1 for current project status).

OC San accepts a limited quantity of dry weather urban runoff diversions to the sanitary sewer system. Each dry weather connection must be approved by the Board of Directors prior to connection. This is a permit-based program and hydraulic flow and capacity issues are assessed on a case-by-case basis as part of the permit review and approval process. OC San also utilizes the model to review major development proposals submitted to the Planning Division through the CEQA process. If not included in the CEQA documents, OC San staff requests wastewater flow estimates for large projects, projects tributary to known system deficiencies, and projects located in areas with rapid development or rapidly changing land use. The flow estimates are introduced to the model as inflows and model runs are executed that reflect present day dry and wet weather flow conditions. The results are evaluated for impacts. If the model indicates a capacity deficiency, OC San staff works with the member agency to better quantify the flows and identify possible solutions. Projects that are not a cause for concern are tracked; however, the flows are not incorporated into the model because the projects are only in the preliminary planning stages and may not be constructed. OC San staff is confident that increased flow patterns due to future projects will be reflected in the population estimates used as the basis for generating wastewater flows (developed by the Center for Demographic Research [CDR]). In any case, projects not reported to CDR are researched and consolidated as part of the periodic collection system capacity evaluation.

WDR Attachment D, Section 8.2 Capacity Assessment and Design Criteria:

The Plan must include procedures to identify system components that are experiencing or contributing to spills caused by hydraulic deficiency and/or limited capacity, including procedures to identify the appropriate hydraulic capacity of key system elements for:

- *Dry-weather peak flow conditions that cause or contributes to spill events;*

- *The appropriate design storm(s) or wet weather events that causes or contributes to spill events;*
- *The capacity of key system components; and*
- *Identify the major sources that contribute to the peak flows associated with sewer spills.*

The capacity assessment must consider:
- *Data from existing system condition assessments, system inspections, system audits, spill history, and other available information;*
- *Capacity of flood-prone systems subject to increased infiltration and inflow, under normal local and regional storm conditions;*

The project initiation criteria used in the 2019 MPU was as follows: 1) sewers larger than 12 inches in diameter were determined to be deficient where the model showed a surcharge of greater than two (2) feet, or if the surcharging came to within 5 feet of the ground surface, unless the system was designed to operate under a surcharged condition, without a spill occurring, during peak wet weather flow conditions, 2) sewer 12 inches in diameter or smaller were determined to be deficient when the ratio of the peak depth of flow to pipe diameter (d/D) was greater than 1.0 (indicating that the pipe was full) during peak wet weather flow, 3) d/D was greater than 0.75 for existing pipes during peak dry weather flow, and 4) d/D was greater than 1.0 for lined pipes during dry weather flow. The project initiation criteria for capacity concerns are lower for smaller pipes because they are generally more affected by blockages and hydraulic inefficiencies such as offset joints. This allowed capital improvement projects to be scheduled and completed before spills would occur due to capacity restrictions.

OC San's design standards indicate that when redesigning sewers from 8 to 18 inches in diameter the desired ratio of peak depth of flow to pipe diameter (d/D) is equal to 0.5. For pipes larger than 18 inches the desired ratio of the peak depth of flow to pipe diameter (d/D) is equal to 0.75. As with all design criteria, the parameters listed here are guidelines. Each site-specific design will address project specific limitations and may not meet the strict bounds of the criteria above.

WDR Attachment D, Section 8.3 Prioritization of Corrective Action:

The findings of the condition assessments and capacity assessments must be used to prioritize corrective actions. Prioritization must consider the severity of the consequences of potential spills.

The 2019 MPU identifies both short-term and long-term capital improvements needed to address identified hydraulic deficiencies. Prioritization of projects was based on the severity of the hydraulic deficiency and the potential consequences of spills occurring in those areas identified. Project recommendations were incorporated into OC San's annual project validation effort the results of which are reflected in the Adopted Budget FY 2024-25. Table M-1 includes the latest project status, project start date, as well as the reasons for the change in schedule (if applicable). Projects not previously included in OC San's CIP have been deleted from the table.

WDR Attachment D, Section 8.4 Capital Improvement Plan:

The capital improvement plan must include the following items:

- *Project schedules including completion dates for all portions of the capital improvement program;*
- *Internal and external project funding sources for each project; and*
- *Joint coordination between operation and maintenance staff, and engineering staff/consultants during planning, design, and construction of capital improvement projects; and Interagency coordination with other impacted utility agencies.*

OC San's CIP is validated annually, and major revisions are incorporated into the agency's budget cycle. The validation process consists of evaluating existing and certifying new CIP projects for the next ten-year period. Active and future projects in the CIP are described in detail in the budget book. Significant changes in the project scope and/or implementation schedule are noted within the project's justification portion of the project page.

Asset management is an essential part of OC San and our overall mission to deliver safe, economical, and reliable wastewater treatment services. Every part of our organization is involved in some aspect of asset management and ensuring that assets are designed, const-ructed, operated, and maintained to reliably deliver the required level of service to our customers. Through a very collaborative effort, each group plays an important role in ensuring that the individual asset management initiatives are properly executed.

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