ORANGE COUNTY SANITATION DISTRICT
SPECIAL NOTICE REGARDING CORONAVIRUS (COVID-19) AND ATTENDANCE AT PUBLIC MEETINGS

On March 4, 2020, Governor Newsom proclaimed a State of Emergency in California as a result of the threat of COVID-19. On March 12, 2020 and March 18, 2020, Governor Newsom issued Executive Order N-25-20 and Executive Order N-29-20, which temporarily suspends portions of the Brown Act which addresses the conduct of public meetings.

The General Manager and the Chairman of the Board of Directors have determined that due to the size of the Orange County Sanitation District's Board of Directors (25), and the health and safety of the members, the Board of Directors will be participating in meetings of the Board telephonically and via Internet accessibility.

PUBLIC PARTICIPATION

Your participation is always welcome. The Special Board of Directors meeting will be available to the public online at:

https://ocsd.legistar.com/Calendar.aspx

You may submit your comments and questions in writing for the Board's consideration in advance of the meeting by using the eComment feature available via the webpage above or sending them to OCSanClerk@ocsd.com with the subject line "PUBLIC COMMENT ITEM # (insert the item number relevant to your comment)" or "PUBLIC COMMENT NON-AGENDA ITEM". Submit your written comments *by 2:00 p.m. on Tuesday, March 16, 2021*.

You may also submit comments and questions for the Board's consideration during the meeting by using the eComment feature that will be available via the webpage above for the duration of the meeting.

All public comments will be provided to the Board and may be read into the record or compiled as part of the record.

Thank you.

ORANGE COUNTY SANITATION DISTRICT
10844 Ellis Avenue
Fountain Valley, CA 92708
714.962.2411
www.ocsan.gov

March 9, 2021

NOTICE OF SPECIAL MEETING

Strategic Planning

BOARD OF DIRECTORS
ORANGE COUNTY SANITATION DISTRICT

Wednesday, March 17, 2021 – 2:00 P.M.

ACCESSIBILITY FOR THE GENERAL PUBLIC

Due to the spread of COVID-19, the Orange County Sanitation District will be holding all upcoming Board and Committee meetings by teleconferencing and Internet accessibility. This meeting will be available to the public online at:

https://ocsd.legistar.com/Calendar.aspx

The Special Meeting of the Board of Directors of the Orange County Sanitation District will be held in the manner indicated above on Wednesday, March 17, 2021 at 2:00 p.m.

Clerk of the Board

Upcoming Meetings:

Steering Committee - **Wednesday, March 24, 2021 at 5:00 p.m.**
Board Meeting - **Wednesday, March 24, 2021 at 6:00 p.m.**

Serving:
Anaheim
Brea
Buena Park
Cypress
Fountain Valley
Fullerton
Garden Grove
Huntington Beach
Irvine
La Habra
La Palma
Los Alamitos
Newport Beach
Orange
Placentia
Santa Ana
Seal Beach
Stanton
Tustin
Villa Park
County of Orange
Costa Mesa Sanitary District
Midway City Sanitary District
Irvine Ranch Water District
Yorba Linda Water District

ORANGE COUNTY SANITATION DISTRICT
BOARD OF DIRECTORS
Complete Roster

Effective 2/9/2021

AGENCY/CITIES	ACTIVE DIRECTOR	ALTERNATE DIRECTOR
Anaheim	Stephen Faessel	Jose Diaz
Brea	Glenn Parker	Steven Vargas
Buena Park	Art Brown	Connor Traut
Cypress	Stacy Berry	Anne Hertz
Fountain Valley	Patrick Harper	Glenn Grandis
Fullerton	Jesus J. Silva	Nick Dunlap
Garden Grove	Steve Jones	John O'Neill
Huntington Beach	Kim Carr	Dan Kalmick
Irvine	Anthony Kuo	Farrah N. Khan
La Habra	Rose Espinoza	Jose Medrano
La Palma	Marshall Goodman	Nitesh Patel
Los Alamitos	Mark A. Chirco	Ron Bates
Newport Beach	Brad Avery	Joy Brenner
Orange	Kim Nichols	Chip Monaco
Placentia	Chad Wanke	Ward Smith
Santa Ana	Johnathan Ryan Hernandez	Nelida Mendoza
Seal Beach	Sandra Massa-Lavitt	Schelly Sustarsic
Stanton	David Shawver	Carol Warren
Tustin	Ryan Gallagher	Austin Lumbard
Villa Park	Chad Zimmerman	Robert Collacott
Sanitary/Water Districts		
Costa Mesa Sanitary District	Bob Ooten	Art Perry
Midway City Sanitary District	Andrew Nguyen	Sergio Contreras
Irvine Ranch Water District	John Withers	Douglas Reinhart
Yorba Linda Water District	Brooke Jones	Phil Hawkins
County Areas		
Board of Supervisors	Doug Chaffee	Donald P. Wagner

ORANGE COUNTY SANITATION DISTRICT

BOARD OF DIRECTORS

Special Meeting Agenda

Wednesday, March 17, 2021 - 2:00 PM

Board Room
Administration Building
10844 Ellis Avenue
Fountain Valley, CA 92708
(714) 593-7433

AGENDA POSTING: In accordance with the requirements of California Government Code Section 54954.2, this agenda has been posted outside the main gate of the Sanitation District's Administration Building located at 10844 Ellis Avenue, Fountain Valley, California, and on the Sanitation District's website at www.ocsd.com not less than 72 hours prior to the meeting date and time above. All public records relating to each agenda item, including any public records distributed less than 72 hours prior to the meeting to all, or a majority of the Board of Directors, are available for public inspection in the office of the Clerk of the Board.

AGENDA DESCRIPTION: The agenda provides a brief general description of each item of business to be considered or discussed. The recommended action does not indicate what action will be taken. The Board of Directors may take any action which is deemed appropriate.

MEETING AUDIO: An audio recording of this meeting is available within 24 hours after adjournment of the meeting. Please contact the Clerk of the Board's office at (714) 593-7433 to request the audio file.

NOTICE TO DIRECTORS: To place items on the agenda for a Committee or Board Meeting, the item must be submitted in writing to the Clerk of the Board: Kelly A. Lore, MMC, (714) 593-7433 / klore@ocsd.com at least 14 days before the meeting.

FOR ANY QUESTIONS ON THE AGENDA, BOARD MEMBERS MAY CONTACT STAFF AT:

General Manager: Jim Herberg, jherberg@ocsd.com / (714) 593-7300
Asst. General Manager: Lorenzo Tyner, ltyner@ocsd.com / (714) 593-7550
Asst. General Manager: Rob Thompson, rthompson@ocsd.com / (714) 593-7310
Director of Human Resources: Celia Chandler, cchandler@ocsd.com / (714) 593-7202
Director of Engineering: Kathy Millea, kmillea@ocsd.com / (714) 593-7365
Director of Environmental Services: Lan Wiborg, lwiborg@ocsd.com / (714) 593-7450

CALL TO ORDER

(Board Chairman David Shawver)

PLEDGE OF ALLEGIANCE

ROLL CALL

Clerk of the Board

PUBLIC COMMENTS:

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NON-CONSENT:

1. STRATEGIC PLAN WORKSHOP 2021-1520

RECOMMENDATION:

Information Only.

Originator: Jim Herberg

Attachments: Agenda Report
Asset Management Policy Paper 2021
Energy Independence Policy Paper 2021
Climate and Catastrophic Event Resilience Policy Paper 2021
Water Reuse Policy Paper 2021
Chemical Sustainability Policy Paper 2021
Strategic Plan November 2019

OTHER BUSINESS AND COMMUNICATIONS OR SUPPLEMENTAL AGENDA ITEMS, IF ANY:

ADJOURNMENT:

Adjourn the Special Board meeting until the Regular Meeting of the Board of Directors on March 24, 2021 at 6:00 p.m.

Administration Building
10844 Ellis Avenue
Fountain Valley, CA 92708
(714) 593-7433

File #: 2021-1520 **Agenda Date:** 3/17/2021 **Agenda Item No:** 1.

FROM: James D. Herberg, General Manager

SUBJECT:

STRATEGIC PLAN WORKSHOP

GENERAL MANAGER'S RECOMMENDATION

RECOMMENDATION:

Information Only.

BACKGROUND

The Orange County Sanitation District (Sanitation District) is updating its Strategic Plan. The Strategic Plan is a policy level roadmap which defines the future desired state of the agency and lays out initiatives to move toward that desired state. The Strategic Plan is intended to be a living document that is adjusted to meet new needs or regulations faced by the Sanitation District.

There are 14 individual policy areas which comprise the overall Strategic Plan. The policy statements were developed by the Executive Management Team based on input previously provided by Board Members and staff. The Board's input and direction is critical in developing and updating the Strategic Plan. In order to create a common understanding of the existing Strategic Plan and to receive input, each policy area will be presented individually over three Board of Directors' workshops as follows:

February 17, 2021 (Complete)
- Budget Control and Fiscal Discipline
- Cybersecurity
- Property Management
- Resilient Staffing
- Safety and Physical Security

March 17, 2021
- Asset Management
- Energy Independence
- Water Reuse
- Climate and Catastrophic Event Resilience
- Chemical Sustainability

April 21, 2021

- Emerging Pollutants (Constituents of Emerging Concern)
- Biosolids Management
- Environmental Water Quality, Stormwater Management and Urban Runoff
- Food Waste Treatment - energy, capital, operations, regulations, policy

Staff intends to finalize the items and compile them into a draft Plan for formal adoption in October/November of this year. The adopted Strategic Plan will be the basis of Fiscal Year 2022-23 and 2023-24 budget development.

RELEVANT STANDARDS

- Maintain and adhere to appropriate internal planning documents: Strategic Plan
- Sustain 1, 5, 20-year planning horizons
- Build brand, trust, and support with policy makers and community leaders

PROBLEM

The current Strategic Plan was adopted by the Board of Directors in November 2019 and is currently in effect. The strategic planning process is intended to be reviewed every two years to make necessary adjustments due to new issues of concern for the Sanitation District.

PROPOSED SOLUTION

Solicit and incorporate the Board of Directors' input in the development of the proposed Strategic Plan document.

PRIOR COMMITTEE/BOARD ACTIONS

February 2021 - Special Board of Directors Meeting - Strategic Plan Workshop No. 1

January 2021 - Steering Committee reviewed the Strategic Plan development outline.

ATTACHMENT

The following attachment(s) may be viewed on-line at the OC San website (www.ocsan.gov) with the complete agenda package:

- Orange County Sanitation District Asset Management Policy Statement
- Orange County Sanitation District Energy Independence Policy Statement
- Orange County Sanitation District Climate and Catastrophic Event Resilience Policy Statement
- Orange County Sanitation District Water Reuse Policy Statement
- Orange County Sanitation District Chemical Sustainability Policy Statement
- Orange County Sanitation District Strategic Plan November 2019

Orange County Sanitation District
Asset Management Policy

Summary Policy Statement

The Orange County Sanitation District (OC San) will assess and manage the collection system and treatment plant systems and assets to improve resilience and reliability while lowering lifecycle costs. This will be accomplished through adaptive operation, coordinated maintenance and condition assessment, and planned capital investment. Staff will balance maintenance, refurbishment, and replacement strategies to maximize useful life, system availability and efficiency.

Background

OC San is a regional governmental agency principally chartered to protect the public health through collection and treatment of wastewater. The governing Board of Directors has defined this role to include the recovery and utilization of resources from wastewater for the public good as a part of that mission. The environmental impact mitigation of the human activity of 2.6 million people and the natural drainage of the 471 square miles OC San serves is our principal concern.

OC San owns and operates extensive facilities to achieve its mission. OC San estimates the replacement value of the civil, mechanical, and electrical assets in its collection system, Plant No 1 in Fountain Valley, and Plant No. 2 in Huntington Beach to be nearly $11 billion. OC San has been building the piping, pumping, and treatment infrastructure it utilizes for more than sixty-five years. It is necessary to expand, renew, replace, demolish, and rebuild components of the system to deal with wear and tear and meet new challenges.

The early years for OC San were characterized mostly by capacity expansion to meet the challenges of increased flows as the county grew. The late 1970s to the 2000s were more defined by improved levels of treatment. The last ten years have been focused on increasing the level of resource reuse. One of the key success factors for OC San has been the ability to upgrade and repurpose its operating facilities to accomplish high levels of treatment and reuse.

Current Situation

OC San is a highly planned, forward-looking organization. The collection system and each of the treatment plants are broken down into granular functional parts. Each part is well defined and future requirements are estimated. OC San has a detailed understanding of what is owned, what condition it is in, and how it is capable of performing.

The collection system is made up of independent pipe networks that were installed by the former independent sanitation districts to deliver flow to the joint treatment works. Generally speaking, the natural watershed drainages in the service area are served by

major trunk sewer systems. OC San has worked with member city and agency staff to understand future development plans, flow estimates, and has collected historical inflow and infiltration rates during wet weather events to assure adequate flow carrying capability exists in each trunk sewer system. OC San also factors in the effects of drought and lower domestic water usage rates to make sure the sewers operate properly at low-flow rates.

The treatment plants are broken down into the discrete process units that make up the whole. Each plant has a headworks unit that brings in flow and does preliminary treatment, a primary treatment unit which does gravity settling, multiple biological secondary treatment systems, solids handling and dewatering, power generation and distribution utilities, water and air system utilities, and an outfall system to release treated water to the ocean. Each plant can treat 320 million gallons per day of wet weather flow, but only 185 million gallons total on average is treated. OC San must always maintain the ability to treat both the average flow and peak wet weather flow.

OC San understands that every asset has an expected life. Electrical systems are generally limited by component obsolescence to 20 years of life. Mechanical and coating systems are also generally limited by erosion, corrosion, and wear to 20 years of life. Civil structures and pipes are generally limited to 60 to 80 years of life if maintained on a regular basis.

With this in mind, OC San has created a facilities master plan that plans to renew or replace facilities on this regular basis. Collection system projects are driven by growth projections or condition findings. Pipes are upsized or renewed based on flow projections, corrosion observation, coating system failure, or the ability to increase reclamation. The 15 regional pump stations are renewed on a more frequent basis due to the mechanical wear and tear and electrical component obsolescence needs, about every 25 years.

The master plan for the treatment plants is much more dynamic. In addition to the electrical, mechanical, and civil asset considerations, there is also the need to meet new requirements. The new requirements are driven by regulatory agencies or by the Board of Directors to change a discretionary level of service. Examples include: capacity demands (more water, more solids), lower discharge requirements (lower BOD/TSS to the outfall, lower nutrients to the ocean), more water for reclamation, better energy conversion of solids, and many more. The 2017 Facilities Master Plan took a snapshot in time looking at the anticipated needs and levels of service to lay out a detailed project plan to morph OC San infrastructure over time to meet the expectation. Renewal or replacement projects with costs and schedules were laid out for each individual unit of the treatment plants to address capacity, condition, level of service, and anticipated new regulatory drivers.

Policy Statement

OC San will continue to invest in the infrastructure necessary to meet its mission. OC San will seek to provide its required level of service at the minimum lifecycle cost for its

collection and treatment systems. The 2017 Master Plan was the snapshot basis of the Capital Improvement Plan, but the Asset Management Plan is the means to update and modify the Capital Improvement Plan to meet new requirements and conditions as time goes by.

OC San will understand in a transparent way: what it owns, the condition of those assets, the capacity of collections and treatment required, the level of service required by its regulators and Board of Directors and will anticipate new regulations that may require system improvement. This understanding will drive coherent operations, targeted maintenance, and capital investment strategies to assure resilient, lowest lifecycle cost compliance with the requirements.

Operations is committed to optimizing the operation of the systems to extend equipment life and minimize energy and chemical utilization, while meeting all regulatory and level-of-service requirement. Maintenance is committed to maintain the installed assets in a ready state for operations. Maintenance will seek to balance individual component preventive maintenance, repair, and renewal in harmony with the Capital Program. The Capital Improvement Program is based on the Master Plan, modified by the annual Asset Management Plan, and will execute the projects to install, renew, or replace trunk sewers or treatment plant units on a scheduled basis.

Asset Management at OC San is the living management of the operation strategies, maintenance plans, and implementation of the Capital Improvement Plan. OC San will find creative ways to maximize asset life or meet new capacity or level of service goals through operations and maintenance. OC San will annually reassess its condition, capacity, level of service, and regulatory conditions to drive operations and maintenance practices and modify the Capital Improvement Plan projects.

Initiatives to Support Progress Toward the Policy Goal

Initiative: Create an annual Asset Management plan documenting the condition of the collection system and treatment plants, and upcoming maintenance or capital projects.

Initiative: Coordinate the efforts of operations, collections, mechanical maintenance, electrical maintenance, instrument maintenance and engineering through process teams to assure OC San's resources are focused on the high priority work functions.

Initiative: Maintain a 20-year forecast of all CIP projects needed to maintain or upgrade OC San's nearly $11 billion in assets on a prioritized risk basis to establish rate structures.

Orange County Sanitation District
Energy Independence Policy

Summary Policy Statement

The Orange County Sanitation District (OC San) will strive to be a net energy exporter. Electrical, thermal, and methane gas generation will be maximized. Energy utilization will be minimized using sound engineering and financial principles.

Background

OC San must balance the impacts of its operation between land, air, and water. For example, as a water focused utility, OC San seeks to produce the cleanest water possible to minimize the impacts of human activity on the ocean, as well as to renew freshwater resources for further domestic and commercial use. A natural result of cleaning this water is the separation and concentration of constituent solid and gaseous materials. These solid and gaseous products can impact land and air. The balance of impact on land, air, and water are shifted by application or creation of energy through chemical, biological, or thermal conversion technics.

OC San is also committed to be a good neighbor. As such, significant amounts of energy are spent capturing and converting odorous air and vapor streams. OC San has pursued a comprehensive program to cover and seal its liquid and solid processes. Air streams are ducted to large fans which move thousands of cubic feet of foul air per minute through chemical, biological, and activated carbon beds to scrub the air of odorants that are regulated or may be perceived as a nuisance by the community.

OC San has utilized an anaerobic digestion process that relies on biological conversion of solid organic material to methane and carbon dioxide gas. The methane is converted to electrical and heat energy in power plants for internal use. OC San's secondary treatment system is another example of using energy to convert water impacts to air emissions. Approximately 23% of OC San's energy usage within the treatment process is devoted to aerating water so biological agents can convert soluble organic material to nitrogen and carbon dioxide. The generation of energy itself creates an impact on the environment in air and thermal emissions.

Current Situation

The potential exists to further shift environmental impacts between land, air, and water through the utilization of energy. OC San is an environmental steward that seeks to balance and minimize overall impact by efficiently utilizing the energy inputs to its processes and maximizing the harvesting of energy available in the incoming wastewater.

On the energy use side of the ledger, OC San invests prudently in lifecycle energy efficiency to minimize the use of energy to achieve its mission. Pumping systems to lift water and move material are premium efficiency. Thermal energy is harvested from power production for use in the process and to heat and cool occupied buildings. Aeration

compressors and diffusers are selected by overall efficiency. Lighting systems are upgraded over time to more efficient technologies and lighting levels are balanced between safety and security needs versus energy utilization and light pollution concerns. Facility designers and operators make careful choices regarding the utilization of every watt of electricity, BTU of heat, and therm of gas consumed.

On the energy generation side of the ledger, OC San seeks to maximize the internal creation of energy. The primary source of energy creation is in digester gas, also called biogas, which is mostly methane. Organic solids collected and concentrated in the water treatment processes are converted biologically to biogas composed of 65% methane, 34% carbon dioxide, and other trace constituents. OC San has been using this technology since the 1950s. Research has been ongoing since that time to maximize the production of digester gas. Some of the areas of research include improved mixing and heating; improved feeding; chemical addition to limit trace pollutant production; introduction of food waste; injection of fats, oils, and grease; and cell lysing.

OC San cleans the biogas and converts this biogas into electricity, heat, and exhaust gas. The exhaust gas is regulated ever more tightly for nitrogen compounds, carbon monoxide, particulates, and volatile organic compounds which require costly and performance degrading engine control technologies. This is another example of an air impact/energy trade off. These internal systems of energy harvesting provide roughly 66% of OC San's electrical demand and 92% of OC San's thermal demand in the treatment plants. OC San can shift the digester gas between treatment plants via an interplant pipeline and has roughly 8 MW of additional generation capacity if more gas is produced.

In addition, OC San is installing electrical battery storage capacity. This system is primarily in place to lower operating cost by importing electricity for charging during low-cost nighttime hours and discharging that energy for process use during peak-cost hours. The slight energy loss due to system inefficiencies is outweighed by the cost savings and benefit to the region by lowering the peak demand of OC San by up to five megawatts.

Policy Statement

OC San seeks to be energy independent by self-generating all the electrical and thermal energy necessary to sustain its operations. This will be accomplished by economically minimizing its utilization requirements and maximizing energy harvested from the wastewater it receives. OC San will also study and use photovoltaic cells in non-process areas where it makes economic sense. Energy independence will improve OC San's environmental impact and improve its operational reliability and resiliency.

When OC San has achieved energy independence, it will seek to make excess biogenic or green energy available to external users via gas sales, power grid exports, or transportation fuels. The State of California has set goals for renewable energy utilization for electrical production and hydrogen transportation fuels. OC San's biogas is viewed

favorably in these industries to meet the State of California targets. OC San is working very diligently and creatively to maximize the production of gas and reduce its own energy needs, but energy independence is the first goal which has not yet been met.

Staff recommends that innovative research continue to maximize energy harvesting and to minimize energy inputs first to make OC San energy independent in the most basic mission of protecting the public health and the environment. Once this has been achieved, excess energy can be made available for meeting the State of California's goals for the electrical grid and transportation fuels.

Initiatives to Support Progress Toward the Policy Goal

Initiative: Maximize the anaerobic digestion conversion of organics to methane through receipt of food waste and operational techniques.

Initiative: Investigate and install energy storage and photovoltaic systems where practical to achieve energy independence/resilience.

Initiative: Continue to support the conversion of biomethane into electricity and heat for process use. Improve systems as necessary to comply with air regulations.

Orange County Sanitation District
Climate and Catastrophic Event Resilience Policy

Summary Policy Statement

The Orange County Sanitation District (OC San) aims to design, maintain, and operate valuable wastewater assets that withstand or adapt to adverse conditions in a reasonable manner that is both cost-effective and sustainable for present and future generations. These adverse conditions include heavy rains, flooding, sea level rise, earthquakes, tsunamis, extreme heat, wildfires, and electrical grid interruptions.

Background

OC San owns and operates extensive wastewater collection and treatment facilities valued at nearly $11 billion. OC San service area faces special challenges because of the geographic location of its facilities. These challenges include: its position on and near seismic risk factors, its proximity to the Pacific Coast, adjacency of its treatment facilities to the Santa Ana River, and being served by increasingly fragile energy utilities.

OC San's facilities are situated on or near several seismic risk factors. Plant No. 2 is located directly on top of the Newport-Inglewood fault. Both plants and the collection system are influenced by many adjacent major and minor faults capable of delivering damaging energy. Both of our treatment plants and the majority of our collection system sit on top of silty, alluvial soils that can have the effect of amplifying the earth motion and risk liquefaction during a seismic event. OC San has invested significantly over the last 50 years to improve the soils, foundations, and structures to mitigate these seismic risks. As geotechnical and structural knowledge and building codes progress, upgrades and facility replacements will be necessary.

Another seismic risk associated with having a treatment plant and several pump stations located on the Pacific Coast, is the risk of tsunami inundation. OC San has been working with and reviewing the plans of the City of Huntington Beach and the City of Newport Beach to understand and quantify this risk. The American Society of Civil Engineers (ASCE) has created a new standard, ASCE 7-16, to layout design parameters for lateral forces and inundation zone associated with potential tsunamis.

OC San understands that climactic factors we face change widely over time. OC San's systems must perform in extreme wet weather situations (atmospheric rivers), extreme dry weather conditions (drought), extreme tidal conditions (king tides, rising sea levels), as well as high and low temperature extremes. OC San generally designs for historical and expected "average conditions" for optimal performance but must also assure operations for extreme weather events.

OC San serves a critical public health role. Its operations must be reliable 24 hours per day, 365 days a year. Electricity, and to a lesser extent natural gas, are necessary for pumping and treatment operations. Both electricity and natural gas supplies have

become increasingly vulnerable to interruption. Electricity deliveries are more vulnerable due to wildfire outage criteria, loss of local generation assets, aging infrastructure and extreme weather events. Natural gas supplies are more vulnerable due to the loss of local storage capacity, aging infrastructure, line corrosion, and more stringent regulatory requirements. OC San has significant capacity to self-supply critical energy requirement for extended periods.

Current Situation

OC San has spent considerable effort quantifying its seismic, climate, and utility supply risks. Several key studies have been initiated and will be completed in the next two years. The most acute risk factor faced by OC San is seismic risk. Climate and utility supply risks are more accurately described as chronic risks.

Seismic risk factors include ground shaking, liquefaction, lateral spreading, and fault rupture. Both treatment plants are situated in historic riverbed with poor soil conditions. The collection system is vulnerable to failures during seismic events. The state of the art for seismic design has changed greatly over OC San's history and will continue to do so. Many of our critical structures were designed or installed prior to the great learning that occurred in the earthquakes of the 1990s. Significant effort has been expended to better characterize the soil conditions under our treatment plants and pump stations. Projects to refurbish or replace existing unit processes are, or soon will be, scoped and budgeted to provide enhanced seismic resilience. These measures include soil mixing to stiffen the soil, various foundation designs and building structure improvements.

Tsunami resilience and flooding protection can go hand in hand. To a great extent, these two risk factors can be mitigated in the same way. The Tsunami guidelines for inundation in ASCE 7-16 are a reasonable peer reviewed standard. By complying with this standard for Huntington Beach and Newport Beach, OC San will be reasonably prepared for flooding caused by extreme storm events and conservative sea level rise estimates at Plant No. 2 and pump stations in the City of Newport Beach.

OC San has also expended significant effort to prepare for the effects of weather extremes on its operations. Extreme wet weather impacts operations. Inflow and infiltration during intense storm activity have multiplied average dry weather flow rate by up to three times in recent years. OC San has significant wet weather capacity and will continue to maintain a 640 million gallon per day influent and outfall capacity which is roughly 3.5 times our average dry weather flow. Historically high rains as seen in 1863 and 1938 will push our systems to the limit.

OC San has also adapted its systems to perform in extreme dry weather. OC San in cooperation with OCWD operates the largest potable water reuse system in the world. This is made possible by replumbing our treatment plants and adding new smaller pump stations to deal with extreme low outfall flow rates in the morning hours. OC San also has, and continues to grow, the ability to shift influent flow between its treatment plants which creates additional resilience for risk factors.

Finally, on the topic of utility supply, OC San built redundant supplies for its most critical needs: electricity, natural gas, and water. OC San has maintained three sources of electricity supply for more than 25 years. The treatment plants can be supplied with power from Southern California Edison, OC San's Central Generation Plants or on-site diesel generation systems to maintain basic operation to protect public health. In terms of natural gas, OC San has been producing bio-methane through anaerobic digestion since the 1950s with enough capacity to provide electricity and necessary process heat.

Policy Statement

OC San will continue to build and improve its facilities to meet the seismic, climate and energy infrastructure risks that it faces with a long-term, planned approach. Acute life-safety risks that are identified or facilities that are damaged or fail in a catastrophic event will be addressed very quickly. However, it is not practical to update $11 billion in facilities every time a code is updated, or new climate change estimate is released. OC San will stay abreast of code and climate change estimates as they occur and will implement improvements or replacements to facilities on a long-term basis in line with its asset management practices. OC San generally plans to refurbish or replace its mechanical and electrical assets every 20 to 25 years with an average capital improvement investment of $250 million per year.

OC San facilities are designed to meet industry codes. As time goes on and codes are updated, it is not required to upgrade existing facilities to meet those latest codes unless there is a mandate to do so, or a risk in not doing so is recognized. OC San will accept some incremental risk in having some facilities that are not necessarily compliant with latest building codes or subject to increased greater risks until a project to rehabilitate or replace these facilities is developed. All of OC San's facilities have a planned life span with two to three refurbishment cycles. Identified seismic or flooding vulnerabilities may drive a replacement versus refurbishment decision in the normal capital planning process.

OC San will continue to aspire to energy independence which will help mitigate vulnerabilities to loss of electrical and gas utilities. In addition, OC San will continue to maintain third level, diesel generator, electrical supply capability for critical loads. On-site diesel storage will provide up to three days of power to run the plants. Pump stations diesel generation will be site specific in its design based on flow risks, hydraulic storage capacity, and site constraints. Either on-site generation or quickly deployable mobile generators will provide emergency power for up to days at a time.

Initiatives to Support Progress Toward the Policy Goal:

Initiative: Complete an engineering study of the seismic vulnerabilities of the treatment plants. Incorporate necessary upgrades into future capital improvement projects.

Initiative: Complete the biannual high flow exercise to assure readiness for a high flow event. Maintain a higher level of readiness October 15 through March 15 and in advance of predicted significant rain events.

Orange County Sanitation District
Water Reuse Policy

Summary Policy Statement

The Orange County Sanitation District (OC San) will seek to beneficially reuse all reclaimable water for potable, industrial, irrigation and environmental uses.

Background

For over 40 years, OC San and the Orange County Water District (OCWD) have partnered to beneficially reuse treated wastewater from OC San. OCWD, which serves roughly the same service area as OC San, manages and replenishes the groundwater basin in northern and central Orange County, ensures water reliability and quality, prevents seawater intrusion, and protects Orange County's rights to Santa Ana River water.

Beginning in 1975, OC San contributed treated wastewater from its Plant No. 1 to OCWD for the operation of Water Factory 21, which reclaimed the treated wastewater and injected it along with deep well water into the groundwater basin to prevent seawater intrusion. In the mid-1990s, OCWD needed to expand Water Factory 21. At the same time, OC San faced the challenge of having to build a second ocean outfall pipe to discharge treated wastewater into the Pacific Ocean. Both agencies collaborated to build an advanced water purification facility to resolve these challenges. This state-of-the-art facility, known as the Groundwater Replenishment System (GWRS), took the place of Water Factory 21, and began operation in 2008. The GWRS treats secondary treated wastewater from OC San Plant No. 1 to drinking water standards and uses the purified water for both injection and percolation, through injection wells and recharge basins, as source water to replenish the groundwater basin's drinking water supplies. With approximately 75 percent of the water demand in northern and central Orange County cities coming from the groundwater basin, GWRS supplements existing water supplies by providing a new, reliable, high-quality source of water.

While the original GWRS facility was initially constructed to supply up to 70 million gallons per day (MGD) of purified water, the facility was designed for an ultimate treatment and conveyance capacity of 130 MGD. The original GWRS design intent was to expand the GWRS facility in two phases – an initial and a final expansion of an additional 30 MGD of treatment capacity with each expansion. The GWRS Initial Expansion Project was completed in June 2015 and has been producing up to 100 MGD of purified water for groundwater injection and recharge. The Final Expansion of GWRS is scheduled to be completed in 2023 and will produce the maximum capacity of 130 MGD.

In addition to providing treated wastewater to the GWRS, OC San also provides treated water to OCWD's Green Acres Project, which provides recycled water for landscape

irrigation at parks, schools, and golf courses; and industrial uses, such as carpet dying; toilet flushing; and power generation cooling.

Current Situation

The GWRS currently produces 100 million gallons per day of purified water – enough water for about 850,000 people. All of OC San's Plant No. 1 secondary effluent, between 120-130 MGD, is sent to OCWD for the GWRS and Green Acres Project. However, secondary effluent from OC San's Plant No. 2 and other non-reclaimable flows, such as brine from inland desalters and GWRS's reverse osmosis process, and OC San's process sidestreams, continue to be released into the ocean.

In 2016, OC San and OCWD jointly conducted the Effluent Reuse Study, which evaluated the feasibility of recycling OC San's secondary effluent from Plant No. 2 and identified projects required to achieve the final expansion of the GWRS. The GWRS final expansion effort will include implementation of projects to construct new, modified or rehabilitated facilities at Plant No. 2 to separate reclaimable flows from non-reclaimable flows; to equalize, pump, and convey secondary effluent from OC San's Plant No. 2 to the GWRS facility; and to treat the additional source water to produce 130 MGD of purified water.

Reverse Osmosis brine generated at the GWRS Initial Expansion is currently discharged into the ocean. The 2016 Effluent Reuse Study identified alternative brine management strategies such as evaporation ponds, deep well injection, and engineered wetlands. Evaporation ponds are land intensive and are also energy intensive when combined with a brine crystallizer to remove solids from highly concentrated brine system using heat and pressure. While the areas around both OC San treatment plants have the appropriate geology for brine injection, there are concerns with contamination of drinking water aquifers, and seismic risks due to the Newport-Inglewood zones near Plant No. 2. At this time, it does not appear economically feasible to provide alternative management strategies for the brine discharge.

In November 2016, OC San Board of Directors adopted the Second Amended and Restated Joint Exercise of Powers Agreement for the Development, Operation and Maintenance of the Groundwater Replenishment System and Green Acres Project, which committed the agency to continue supporting the GWRS and the Green Acres Project, and specifically, the final expansion of the GWRS. The implementation of the final phase of the expansion will be executed by multiple projects, some executed by OC San while the others executed by OCWD. Project costs related to GWRS are funded by OCWD, including $50 million reimbursement to OC San for its costs incurred to execute related projects.

By supporting the GWRS Final Expansion, OC San will be able to recycle all reclaimable wastewater generated in its service area and treated at its two treatment plants, and OCWD will have sufficient water to run the GWRS facility to full capacity.

Policy Statement

The treated effluent produced from OC San's Plant Nos. 1 and 2 is a valuable resource that can help boost local water resources and reduce dependence on imported water, while reducing the effluent discharged to the ocean. OC San will continue to seek opportunities for beneficial reuse of all reclaimable wastewater collected and treated at its facilities.

OC San will continue to support the completion of the final expansion of the GWRS in accordance to the adopted Second Amended and Restated Joint Exercise of Powers Agreement for the Development, Operation and Maintenance of the Groundwater Replenishment System and Green Acres Project. This includes providing secondary effluent as source water for GWRS free of charge; allowing OCWD to discharge brine via OC San's ocean outfall free of charge; leasing approximately 10 acres of land to OCWD at $1 per year for the GWRS Final Expansion project; allowing OCWD to discharge North and South Basin extraction well flows to OC San sewers; managing the design and construction efforts of the Plant No. 2 Headworks Modifications Project and the Plant Water Pump Station Replacement Project (OCWD will reimburse up to $50 million of project cost); managing and financing the construction of the Ocean Outfall Low Flow Pump Station at Plant No. 2 and the construction of Plant No. 2 primary and secondary facilities to allow segregation of non-reclaimable flows.

OC San will continue to maximize the delivery of secondary effluent available to GWRS and the Green Acres Project in order to maximize full production of purified recycled water for indirect potable reuse, and industrial and irrigational uses. OC San has been operating the Steve Anderson Lift Station to divert more flows to Plant No. 1. The two agencies regularly communicate and coordinate OC San operations and construction projects that may have impacts on GWRS operation and will continue this collaboration effort.

OC San has adequate flow to maximize the production of the GWRS through final expansion. Diversion of additional non-wastewater into the sewer system is unnecessary. Non-wastewater diversions create high flow risks during wet weather conditions and can introduce constituents of concern to existing water and biosolid reuse programs.

Initiatives to Support Progress Toward the Policy Goal

Initiative: Support the completion of the final phase of the Groundwater Replenishment System and maximize reclaimable wastewater availability to the Orange County Water District.

Initiative: Support Green Acres project water production to provide reclaimed water for industrial and irrigation uses.

Orange County Sanitation District
Chemical Sustainability Policy

Summary Policy Statement

The Orange County Sanitation District (OC San) has a need to use chemicals in its treatment process to improve plant performance, reduce odor and corrosion potential, and meet its regulatory requirements. These commodity chemicals are provided by outside vendors through the purchasing process. Some of these chemicals are subject to price swings due to market condition changes such as energy cost impacts, raw material cost changes, commercial competition changes, and transportation cost volatility. OC San will identify chemicals key to its operation, investigate the market risks for those chemicals and devise strategies to mitigate identified risks to availability and pricing.

Background

OC San's treatment plants and collection system use several bulk chemicals. A sustainable supply of these chemicals is critical to maintaining an acceptable level of treatment and for ensuring compliance with all regulatory requirements. OC San spends about $13 million annually on the procurement of eight key chemicals which generally can be broken down into four categories: coagulants, odor/corrosion control, disinfection, and boiler water treatment. Boiler water treatment chemicals are low volume and readily available and will not be considered here.

Coagulant Chemicals

Coagulant chemicals include ferric chloride, anionic polymer, and cationic polymer. These chemicals are the workhorses of the sewage treatment process. Coagulant chemicals work to clump together organic material so it can more readily be separated from water. Ferric chloride is the first chemical added in the treatment process. It is a powerful settling agent that causes organics to clump together and settle to the bottom of primary basins. It is a double-duty chemical in that it also controls the formation of hydrogen sulfide gas, which is a major odorant, by binding to suspended sulphur compounds and causing them to settle before they can be converted by natural bacterial processes to hydrogen sulfide.

Ferric chloride is an iron salt that is produced by reacting iron with hydrochloric acid. It is generally a byproduct of steel treatment, a leftover pickling agent. Ferric chloride is commonly used in the water and wastewater industries. Historically, this chemical has been the subject of a limited supplier base in Southern California. OC San has been actively splitting supply contracts to multiple vendors to ensure multiple vendors are available. On-site generation of the chemical is impractical due to the hazardous nature of the manufacturing process and acid handling, the bulk steel handing logistics, and waste products disposal.

Anionic polymer works with ferric chloride to further aid in the coagulation or settling of organic compounds in the primary treatment process. These long-chain molecules are designed to be negatively charged to attract or collect positively charged ferric chloride induced organic clumps or flocculant. The use of ferric chloride and anionic polymer is called Chemically Enhanced Primary Treatment or CEPT. OC San has been using CEPT for more than thirty years.

Anionic polymers are specially designed chains with many potential variants and multiple vendors. Part of the purchasing process for polymers involves polymer trials to document the efficacy of different products from different vendors to get the best cost-performance balance.

Cationic polymer is generally used to thicken sludge or biosolids in centrifuges or dissolved air floatation thickeners (DAFT). These long-chained, positively charged molecules are essential to the proper operation of centrifuges and DAFT units. Part of the purchasing process for these polymers also involves polymer trials to document the efficacy of different products from different vendors to get the best cost-performance balance. It is important to note that it is entirely possible that four different cationic polymers will be used to optimize the performance of Plant No. 1 dewatering centrifuges, Plant No. 1 thickening centrifuges, Plant No. 2 dewater centrifuges, and Plant No. 2 DAFTs, because the performance can vary greatly depending on the equipment or process. Each process will have its own polymer trial to determine the cost-performance balance for each application.

Odor Control Chemicals

OC San uses several chemicals in the collection system and the treatment plant to reduce the odors normally attributed to sewage and sewage treatment. These chemicals can either prevent the formation of odor causing compound, called odorants, or they can destroy odorants that already exist. Chemicals that prevent the formation of odorants include ferrous chloride, calcium nitrate, magnesium hydroxide, and caustic.

Chemicals used in the collection systems tend to be more benign than chemicals used in the treatment plants due to their proximity to the public. Ferrous chloride is closely related to Ferric chloride as described above. It is a powerful settling agent that prevents the formation of hydrogen sulfide by tying up and settling sulfide compounds in the collection system. It is a preferred chemical because of its dual role, but it is not as benign as other choices.

Calcium nitrate is another choice for collection system odor control. It works in a different way. Calcium nitrate alters the biological equilibrium in sewage. Generally, bacteria that live by respirating oxygen are the most robust organisms, followed by nitrogen respirating bacteria, and finally sulfur respirating bacteria. Adding calcium nitrate to sewage creates an environment where sulfur loving bacteria do not thrive or create hydrogen sulfide.

Magnesium hydroxide is a third choice for collection system odor control. It works primarily by raising the pH of sewage to a point that is not conducive for odor causing bacteria to thrive. Magnesium hydroxide is the most benign of the chemical choices as it is the main ingredient in Milk of Magnesia.

All three of these chemicals are continuously fed into sewer systems at different points to consistently control the formation of odorants in the system. Where the OC San does not have the ability to site a chemical dosing station and persistent odors are being experienced, there is the option to utilize caustic slug dosing. Caustic slug dosing involves using tanker trucks to discharge up to 6,000 gallons of sodium hydroxide into a sewer manhole structure. The very high pH has the effect of killing the bioslime layer on sewer pipes that creates hydrogen sulfide. This treatment has an instant benefit that reduces hydrogen sulfide production for days to weeks depending on system conditions.

The final major odor fighting chemical is bleach. Bleach is used in treatment plant chemical scrubbers to oxidize odorants in air scrubber units. Bleach is an effective neutralizer of hydrogen sulfide, methyl mercaptan, methyl disulfide, dimethyl disulfide, and many others.

Disinfection

OC San successfully discontinued disinfection of its effluent to the long outfall. This means that thousands of gallons of bleach and sodium bisulfate are no longer required to be purchased or discharged to the ocean. However, in the event of a discharge to the short outfall or river overflow, disinfection by bleach will be required. Significant on-site storage of bleach and dechlorination chemical, sodium bisulfite, is necessary for this emergency contingency. Bleach does have a shelf life of about six months. OC San rotates its disinfection supply to its odor control and plant water treatment systems to prevent product waste.

Process Specific Chemicals

OC San uses pure oxygen to support its activated sludge secondary treatment process for Plant No. 2. OC San previously self-generated pure oxygen using a cryogenic oxygen plant rated at 70 tons per day. This plant was removed because it was inefficient at the current average utilization of 35 tons per day and was at the end of its useful life. OC San contracts for delivery of liquid oxygen and uses a vaporization system to deliver pure gaseous oxygen to the activated sludge process.

Chemical Supply — Purchase vs. Make

OC San has relied on purchasing bulk commodity chemicals for its treatment plants and collection system. This has proven to be an effective strategy for operational flexibility and to allow concentration on core business. Operationally, the types and volume of chemicals change over time. Over time the types of polymers that are most efficient change. There is a need for more or less volume of chemicals based on sewage flow,

sewage quantity, and flow splits between plants. Managing the generation of specialized chemicals using hazardous materials imposes a significant training burden on staff, increases the regulatory oversight and requirements, and increases overall risk to the organization.

OC San maintains a policy to split the volume of orders between two vendors to assure competition exists in the marketplace for ferric chloride. While the OC San generally cooperates with other public agencies to pool purchasing power to secure the lowest possible cost through high volume purchasing, some specialty chemicals like ferric chloride require split orders to maintain competitive market forces.

Current Situation

OC San is constantly changing and improving its facilities to meet new challenges. Each of the facility changes offer new opportunities to reconsider how OC San operates its processes and how chemicals are used. The best chemical stability outcome is to cost-effectively eliminate the use of the chemical. This is the strategy behind cessation of bleach disinfection of the outfall effluent.

Staff continually studies in the process of studying the potential to operate the treatment plants differently to minimize or eliminate use of selected chemicals. Facilities like centrifuge sludge thickening provide new opportunities to adjust ferric chloride and anionic polymer usage. Opportunities for substitute chemicals will be explored to understand overall cost and efficiency savings potential. This includes iron vs. aluminum coagulant studies, anionic polymer trials, and cationic polymer trials. Staff also reevaluates operating parameters such as in-basin sludge co-thickening, primary basin sludge blanket level parameters, as well as the greater loading of the secondary treatment systems. When optimized chemical types and dosages are confirmed, staff reviews the market conditions for each important chemical. This will serve as the basis for a procurement strategy for each chemical.

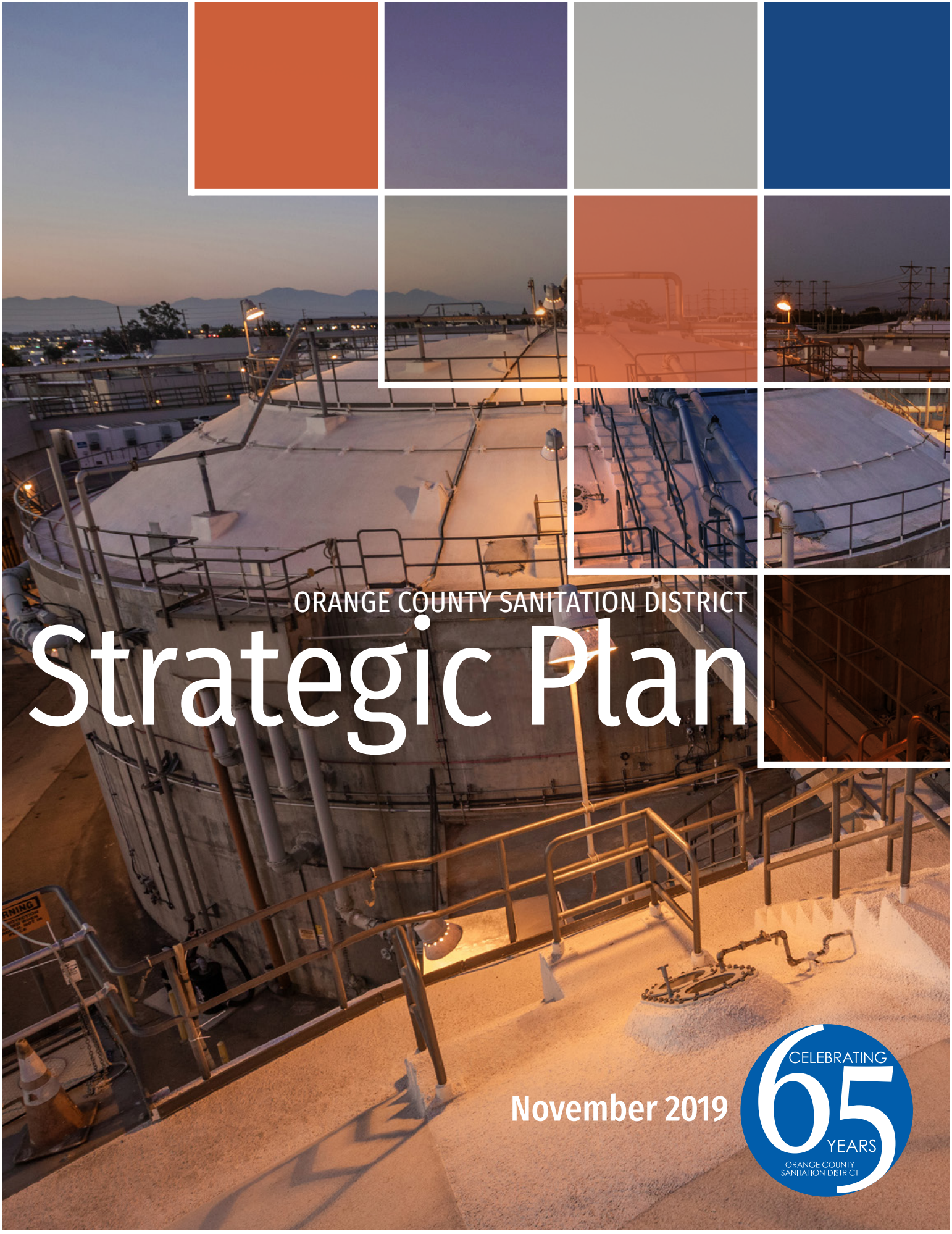
Policy Statement

OC San will thoroughly understand its treatment processes, the potential modes of operation, and the benefit and cost of chemicals to improve or stabilize its process. OC San will maintain a list of necessary chemicals for optimal treatment operations which will consider chemical cost, chemical availability, treatment stability, energy utilization, energy creation, nuisance odor control, biosolids generation/cost, and regulatory permit compliance risks.

Chemicals that are deemed most beneficial will be procured at the lowest overall cost from market providers to the extent possible. Where there are market stability concerns, the purchasing division will devise procurement strategies to mitigate procurement risks. Where procurement risk cannot be satisfactorily mitigated, technical staff will evaluate alternatives such as alternate operating methods, substitute chemical usage, or on-site generation of a chemical if feasible.

Initiatives to Support Progress Toward the Policy Goal

Reduce reliance on particular chemicals and Individual vendors and establish flexibility to utilize other chemicals/processes to accomplish the same operational objectives.



ORANGE COUNTY SANITATION DISTRICT

Strategic Plan

November 2019

CELEBRATING 65 YEARS
ORANGE COUNTY SANITATION DISTRICT

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Board of Directors

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Fountain Valley
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Midway City Sanitary District
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Phil Hawkins

Orange County Board of Supervisors
Doug Chaffee

Strategic Plan Message from the GM

The Orange County Sanitation District is celebrating 65 years of service to the public this year. Over those years the Sanitation District has been adapting itself to the changing requirements and needs of the communities it serves. We have moved from an organization exclusively focused on preservation of public health to a world class resource recovery facility which protects the public health and the environment in ways our founders could never imagine.

This on-going evolution is the intentional outcome of a very deliberate strategic planning process that has been in place at the Sanitation District from the very beginning. From the "Waste Water Disposal and Reclamation for the County of Orange" in 1947 to the Master Plans of the 1980s to the current Strategic Plan, the Sanitation District has always taken the long view to craft a progressive vision and build the necessary infrastructure and staffing to deliver world class service.

This forward-thinking vision of the Sanitation District begins with the Board of Directors. The Board of Directors of the Sanitation District have a long history of mapping out bold, clear visions for the staff to deliver including energy recovery facilities, water reclamation facilities and partnerships, innovative odor control facilities, full secondary treatment levels, urban runoff beach protection partnerships, and the world's largest indirect potable water reuse facility.

I would like to thank the current Board of Directors for continuing the legacy of leadership in strategic planning and innovation. Your commitment and leadership drive the Sanitation District to continue to innovate and meet the challenges facing our region. I look forward to working together to accomplish all the initiatives in this Strategic Plan.

Sincerely,

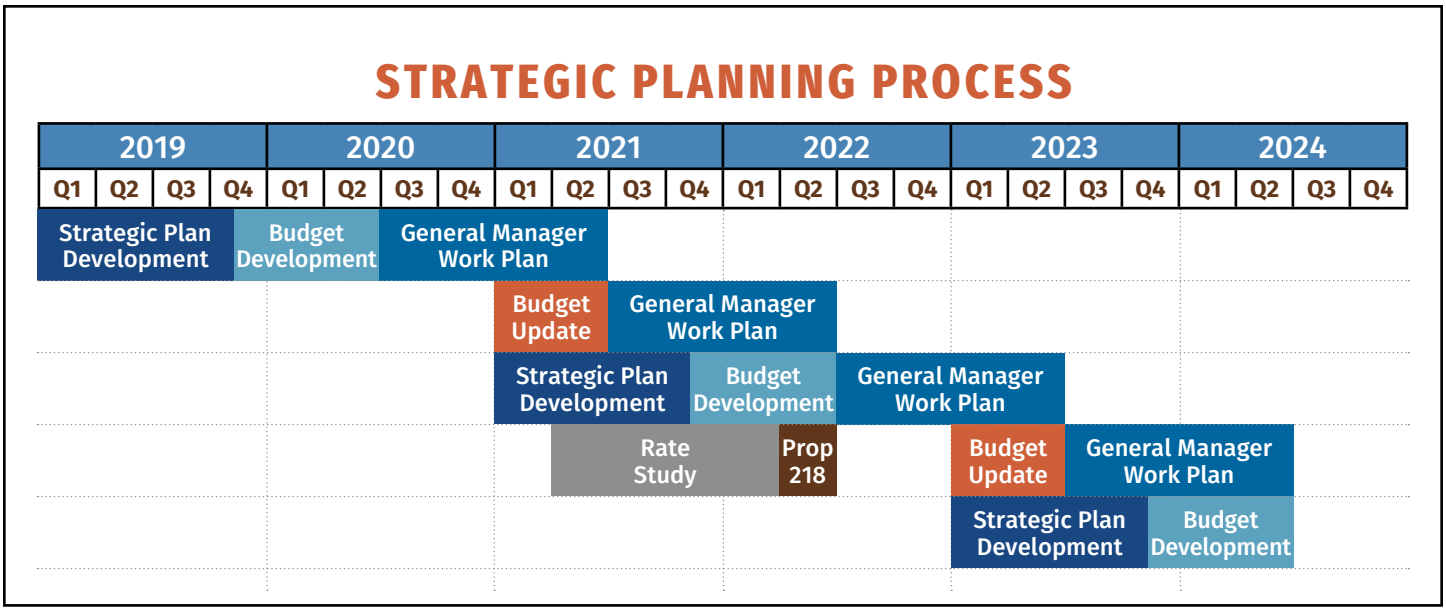
James Herberg

James D. Herberg
General Manager

Strategic Plan Executive Summary

The Orange County Sanitation District (Sanitation District) is a regional wastewater collection and resource recovery agency utilizing extensive public works assets to deliver its vital public services. The Strategic Plan developed by the Board of Directors and staff defines the strategic initiatives to be pursued by the Sanitation District and provides a basis for long-term financial, capital, and operational planning. In addition, it provides for long-term continuity of vision as Board and staff members change over the many years it takes to deliver public works infrastructure.

The Sanitation District has developed a two-year, four-step management process that creates and maintains vision alignment between the Board of Directors, the staff, and the public we serve. Strategic planning is the first step to define the Sanitation District's ability to have people and assets in place to meet its agreed upon mission as defined by the Board. The second step is capital and operational planning based on the adopted strategic plan. The third step is budget development to execute the plan and define the tactical goals to work toward the strategic goals. The final step is execution of the budget plan and tactical goal attainment. These four steps are repeated every two years to maintain alignment and make course corrections based on new Board member input, legal and regulatory changes, and the needs of the communities we serve.



The Strategic Plan is broken down into four broad categories with fourteen topic areas that define our responsibilities and the services we provide. These areas are:

- **Business Principles**
  - o Budget Control and Fiscal Discipline
  - o Asset Management
  - o Cybersecurity
  - o Property Management
- **Environmental Stewardship**
  - o Energy Independence
  - o Climate and Catastrophic Event Resiliency
  - o Food Waste Treatment
  - o Water Reuse
  - o Environmental Water Quality, Stormwater Management and Urban Runoff
- **Wastewater Management**
  - o Chemical Sustainability
  - o Biosolids Management
  - o Constituents of Emerging Concern
- **Workplace Environment**
  - o Resilient Staffing
  - o Safety and Physical Security

Each topic was collaboratively developed between the Board of Directors and staff members. Initial topic lists were discussed with the Steering Committee. Initial policy statements and initiatives were developed which formed the basis for a survey instrument to the Board of Directors. Based on the survey input, individual draft topic papers were presented to the Board of Directors over three meetings in August and September. The topic papers were finalized based on the direction received at these three meetings and are included in this published plan.

The Strategic Plan policy papers break down each area. They begin with a policy statement, provide background, layout the current situation, layout a future policy statement, and finish with initiatives to support progress toward the policy goal.

The Strategic Plan presented in this document is not a radical departure from the current direction, but rather the well-defined iterative update to the direction of the Sanitation District. With the adoption of the Strategic Plan, staff will begin the effort of updating the Asset Management Plan, Capital Improvement Plan, and Financial Plan that are the basis of a two-year budget that will be adopted by the Board of Directors in June. The Budget goals and the General Manager's work plan are the accountability step that measures achievable progress toward the strategic initiatives listed in the Strategic Plan topic papers.

OUR MISSION

"To protect public health and the environment by providing effective wastewater collection, treatment, and recycling."

OUR VISION

ORANGE COUNTY SANITATION DISTRICT WILL BE A LEADER IN:

- Providing reliable, responsive and affordable services in line with customer needs and expectations.
- Protecting public health and the environment, utilizing all practical and effective means for wastewater, energy, and solids resource recovery.
- Continually seeking efficiencies to ensure that the public's money is wisely spent.
- Communicating our mission and strategies with those we serve and all other stakeholders.
- Partnering with others to benefit our customers, this region, and our industry.
- Creating the best possible workforce in terms of safety, productivity, customer service, and training.

OUR CORE VALUES

Our Core Values support the Mission and Vision Statements by expressing the values, beliefs, and philosophy that guides our daily actions. They help form the framework of our organization and reinforce our professional work ethic.

Honesty, Trust and Respect
We aspire to the highest degree of integrity, honesty, trust, and respect in our interaction with each other, our suppliers, our customers, and our community.

Teamwork and Problem Solving
We strive to reach OCSD goals through cooperative efforts and collaboration with each other and our constituencies. We work to solve problems in a creative, cost-effective and safe manner, and we acknowledge team and individual efforts.

Leadership and Commitment
We lead by example, acknowledging the value of our resources and using them wisely and safely to achieve our objectives and goals. We are committed to act in the best interest of our employees, our organization, and our community.

Learning/Teaching - Talents, Skills and Abilities
We continuously develop ourselves, enhancing our talents, skills, and abilities, knowing that only through personal growth and development will we continue to progress as an agency and as individuals.

Recognition/Rewards
We seek to recognize, acknowledge and reward contributions to OCSD by our many talented employees.

The Strategic Plan is broken down into four broad categories with 14 topic areas. Below are the policy statements and corresponding initiatives to achieve the goals of the plan. The complete policy papers can be found in the appendix.

BUSINESS PRINCIPLES

Budget Control and Fiscal Discipline Policy

Policy Statement

The Sanitation District will prudently manage the public funds that it collects. It will take a long-term planning approach to its facilities and rate setting that provides a stable setting program, prudent reserves, and pay-as-you-go philosophy for operating and replacing capital expenses.

Initiatives

- Maintain a rate setting program that keeps the Sanitation District in the lower third of our comparative agencies.
- Maintain a "Pay as You Go" approach to fund current operating expenditures.
- Maintain a portfolio management approach that focuses on safety, liquidity and performance in that order.
- Continually look for ways to reduce total debt payments without lengthening its term.
- Ensure that no new debt issuances are used to support currently programmed capital expenditures and that all existing debt is paid off by 2044.

Asset Management Policy

Policy Statement

The Sanitation District will assess and manage the collection system and treatment plant systems and assets to improve resilience and reliability while lowering lifecycle costs. This will be accomplished through adaptive operation, coordinated maintenance and condition assessment, and planned capital investment. Staff will balance maintenance, refurbishment, and replacement strategies to maximize useful life, system availability and efficiency.

Initiatives

- Create an annual Asset Management plan documenting the condition of the collection system and treatment plants, and upcoming maintenance or capital projects.
- Coordinate the efforts of operations, collections, mechanical maintenance, electrical maintenance, instrument maintenance and engineering through process teams to assure the Sanitation District's resources are focused on the high priority work functions.
- Maintain a 20-year forecast of all CIP projects needed to maintain or upgrade the Sanitation District's nearly $11 billion in assets on a prioritized risk basis to establish rate structures.

Cybersecurity Policy

Policy Statement

The Sanitation District must maintain adequate cybersecurity (information technology security) techniques that protect computer assets, networks, programs, data, and industrial control equipment from unauthorized access or attacks that are aimed for exploitation.

Initiatives

- Conduct various tabletop exercises to determine the organization's ability to respond to a targeted cyberattack and to improve the quality of the response should an attack occur.
- Evaluate, enhance and monitor network security including activities to protect the usability, reliability, integrity and safety of the network by developing Security Operations Center capabilities that support continuous monitoring and is responsible for the continuous threat protection process.
- Conduct a comprehensive third-party cybersecurity operations assessment (Red Team). A thorough Red Team engagement will expose vulnerabilities and risks regarding:
  - Technology — Networks, applications, routers, switches, appliances, etc.
  - People — Staff, independent contractors, departments, business partners, etc.
  - Physical — Offices, warehouses, substations, data centers, buildings, etc.

Property Management Policy

Policy Statement

The Sanitation District owns and operates assets throughout its service area located in property owned in fee, through easements and in the public right-of-way. The Sanitation District will identify and protect all of its property rights to assure that its assets are not encumbered or encroached upon so that the facilities may be properly operated, maintained, upgraded, and replaced.

Initiatives

- The Sanitation District will review its property rights to identify encroachments or encumbrances that restrict operation, maintenance, inspection or emergency repair access. Staff will work with identified parties to remove encroachments or encumbrances.
- Staff will consolidate real estate and property management activities to maximize its resources and effectiveness. With the completion of the property rights and real estate assessments, the Sanitation District will evaluate the various resources available and develop an appropriate resource management plan to assess and maintain its property assets.

ENVIRONMENTAL STEWARDSHIP

Energy Independence Policy

Policy Statement

The Sanitation District will strive to be a net energy exporter. Electrical, thermal, and methane gas generation will be maximized. Energy utilization will be minimized using sound engineering and financial principles.

Initiatives

- Maximize the anaerobic digestion conversion of organics to methane through receipt of food waste and operational techniques.
- Investigate and install energy storage and photovoltaic systems where practical to achieve energy independence/resilience.
- Continue to support the conversion of biomethane into electricity and heat for process use. Improve systems as necessary to comply with air regulations.

Climate and Catastrophic Event Resilience Policy

Policy Statement

The Sanitation District aims to design, maintain and operate valuable wastewater assets that withstand or adapt to adverse conditions in a reasonable manner that is both cost-effective and sustainable for present and future generations. These adverse conditions include heavy rains, flooding, sea level rise, earthquakes, tsunamis, extreme heat, wildfires, and electrical grid interruptions.

Initiatives

- Complete an engineering study of the seismic vulnerabilities of the treatment plants. Incorporate necessary upgrades into future capital improvement projects.
- Complete the biannual high flow exercise to assure readiness for a high flow event. Maintain a higher level of readiness October 15 through March 15 and in advance of predicted significant rain events.
- Study the potential impact of tsunami and changing climate conditions including flooding due to high tides and heavy rain events.

Food Waste Treatment Policy

Policy Statement

The State of California limits the volume of organic waste that may be diverted to landfills. The Sanitation District will collaborate with the County of Orange, other local agencies, and waste haulers to find ways to beneficially reuse food waste, a type of organic waste to assist cities in our service area in meeting their diversion requirements while increasing the Sanitation District's energy production.

Initiatives

- The Sanitation District will accept a preprocessed food waste slurry from contracted waste haulers that will be fed to existing anaerobic digesters. The Sanitation District will charge a tipping fee to offset its costs for capital construction, operations, handling, maintenance, and biosolids disposal.
- Design, build, and operate a food waste receiving station. Create a specification for food waste slurry and contract with solid waste haulers to receive and process food waste.

Water Reuse Policy

Policy Statement

The Sanitation District will seek to beneficially reuse all reclaimable water for potable, industrial, irrigation, and environmental uses.

Initiatives

- Support the completion of the final phase of the Groundwater Replenishment System and maximize reclaimable wastewater availability to the Orange County Water District.
- Support Green Acres project water production to provide reclaimed water for industrial and irrigation uses.

Environmental Water Quality, Stormwater Management and Urban Runoff Policy

Policy Statement

The Sanitation District will partner with storm water permittees to accept up to ten million gallons per day of dry weather urban runoff at no charge in order to improve water quality in streams, rivers, and beaches as long as the constituents within the flow do not adversely impact the Sanitation

District's worker safety, treatment processes, reuse initiatives, or permit compliance. The Sanitation District facilities are subject to significant flow increases during wet weather events and are not capable of accepting stormwater flow volumes.

Initiatives

In accordance with Resolution No. 13-09, the Sanitation District intends to continue accepting up to ten million gallons per day of pumped dry weather urban runoff diversion where existing conveyance capacity exists, and the constituents of the flow will not adversely impact the Sanitation District. The Sanitation District also intends to continue working with industries, agencies, and other facilities to offer alternatives to stormwater and runoff disposal through special purpose discharge permits or other written authorization in accordance with the Sanitation District's Ordinance, where doing so does not negatively affect the Sanitation District's operation or compliance with local, state, and federal regulations, and wastewater can be held for evaluation prior to discharge.

Additionally, to act as a regional partner in resolving issues associated with disposing of and reusing stormwater, the Sanitation District intends to work with local jurisdictions to determine the feasibility of regional wet weather runoff capture, storage, and use projects.

- Issue dry weather urban runoff connection permits up to a total of ten million gallons per day to other service area local agencies to accept pumped dry weather urban runoff flows where existing conveyance capacity exists, and the constituents of the flow will not adversely impact the Sanitation District.

- Continue working with industries, facilities, agencies, and local jurisdictions that have authority over stormwater or surface water runoff to determine the feasibility of regional wet weather runoff capture, storage, and use projects or offer alternatives to stormwater and runoff disposal through permits or other written authorization. The Sanitation District will promote responsible stormwater utilization and sewer protection, where doing so does not negatively affect the Sanitation District's operation or compliance with local, state, and federal regulations, and wastewater can be held for evaluation prior to discharge.

WASTEWATER MANAGEMENT

Chemical Sustainability Policy

Policy Statement

The Sanitation District has a need to use chemicals in its treatment process to improve plant performance, reduce odor and corrosion potential, and meet its regulatory requirements. These commodity chemicals are provided by outside vendors through the purchasing process. Some of these chemicals are subject to price swings due to market condition changes such as energy cost impacts, raw material cost changes, commercial competition changes, and transportation cost volatility. The Sanitation District will identify chemicals key to its operation, investigate the market risks for those chemicals and devise strategies to mitigate identified risks to availability and pricing.

Initiatives

- Reduce reliance on any particular chemical or vendor and establish flexibility to utilize other chemicals/processes to accomplish the same operational objectives.
- Update the Sanitation District's Chemical Sustainability Study and incorporate the results in future procurement recommendations.

Biosolids Management Policy

Policy Statement

The Sanitation District will remain committed to a sustainable biosolids program and will beneficially reuse biosolids in accordance with Resolution No. OCSD 13-03 and the 2017 Biosolids Master Plan.

Initiatives

- Educate and advocate with the local, state, and federal agencies to assure biosolids will continue to be safely and legally used as a soil amendment and monitor and research the development of initiatives of constituents of emerging concerns such as polyfluoroalkyl substances (PFAS) and microplastics that may impact biosolids.
- Stay abreast of new technology options to convert organics to energy and other regional biosolids recycling and renewable energy partnerships within Southern California.
- Proceed with mesophilic and thermophilic biosolids facility at Plant No. 2 to enhance biosolids quality and marketability while improving the Sanitation District's operational resiliency against seismic events.

Constituents of Emerging Concern Policy

Policy Statement

The Sanitation District will partner with other agencies, associations, and institutions to support the use of sound science to inform policy and regulatory decisions on constituents of emerging concern (CECs) at the federal, state, and regional levels. Staff will obtain and maintain current knowledge on CECs under regulatory consideration, including occurrence, analytical methods, regulations, and treatment to support the Sanitation District's mission.

Initiatives

- The Sanitation District will continue to actively engage water and wastewater stakeholders to stay abreast of the scientific progress and any potential operational and financial impacts of CECs and provide timely briefings to the Sanitation District's Management Team and Board to facilitate informed decision making.
- The Sanitation District will continue to develop capacity to detect, quantify, and characterize CECs throughout the service area and treatment process in order to promote treatment effectiveness and the communication of credible risks.
- The Sanitation District will actively research laboratory techniques and other scientific research to understand the real and potential impact of CECs, like polyfluoroalkyl substances (PFAS) and perfluorooctanoic acid (PFOA), on the reuse of water and biosolids. The Sanitation District will use science-based knowledge to help shape legislation and regulation to protect the public health and environment.

WORKPLACE ENVIRONMENT

Resilient Staffing Policy

Policy Statement

The Sanitation District will attract and retain high-quality talent to support its mission and continue to be an industry leader. It will safeguard leadership continuity and support effective performance of the organization by proactively monitoring the changing work environment and requirements to ensure development programs are relevant and build a skilled bench of readily available successors for key leadership and mission-critical positions.

Initiatives

- Maintain and enhance current effective development programs that are in place to provide the direction to identify, develop and select the next generation of prepared, capable and engaged leaders, which include:
  - Vocational/Professional Student Internship Programs
  - Employee Development Program
  - Workforce Vulnerability Assessments
  - Talent Readiness Assessments
  - Building Leaders and Skills for Tomorrow (BLAST) Program
  - Strengthening Operator Training Programs
- Continue cyclical Classification and Compensation studies to ensure job classifications accurately depict the work being performed, to set compensation levels accordingly, and stay abreast of market benefit and salary data.
- Prior to the next scheduled Classification & Compensation study, Human Resources will work with the Board of Directors and meet and confer with the unions to review selected survey agencies based on recognized classification and compensation standards and the job market in which we compete.

Safety and Physical Security

Policy Statement

The Sanitation District will ensure the safety and security of employees, contractors, and visitors through standard practices, policies, and procedures that support a safe and secure environment, provide an appropriate level of security, and safeguard OCSD's property and physical assets.

Initiatives

Safety

- Complete outstanding safety projects, improvements, and corrective actions to apply and obtain Cal/OSHA Voluntary Protection Program (VPP) status; and continue to foster a culture where employees are accountable for their safety as well as the safety of others.

Emergency Management

- Support facility and countywide emergency preparedness, response, and recovery efforts by partnering with entities, such as, the Water Emergency Response Organization of Orange County (WEROC), Orange County Sherriff Department, and local fire departments to plan and continue to conduct disaster preparedness training and exercises.

Security

- Continually identify and assess vulnerabilities and implement solutions through the Security Committee and third-party assessments. Prevent/mitigate security breaches using physical security systems such as video monitoring, access control, and armed security patrols.

Appendix: Policy Papers

Business Principles

Budget Control and Fiscal Discipline Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) will prudently manage the public funds that it collects. It will take a long-term planning approach to its facilities and rate setting that provides a stable setting program, prudent reserves, and pay-as-you-go philosophy for operating and replacing capital expenses.

Background

The Sanitation District manages nearly $500 million annually. These funds support the Sanitation District's operating, capital, and debt expenditures. The Sanitation District focuses its fiscal policy around three distinct areas: Revenues, Portfolio Management, and Debt Management. These areas are described in the Budget, Investment Policy, and Debt policy all of which are updated annually.

Current Situation

Revenues

The majority of the Sanitation District's revenue is generated by user fees and charges. Currently, the Sanitation District fees are in the lower third of its comparison agencies'.

The Sanitation District's revenues come from three general areas: Fees and Charges (74%), Property Taxes (21%) and other smaller revenue sources (5%).

- Fees and Charges: User fees are ongoing fees for services paid by Single Family and Multifamily customers connected to the sewer system. Also included in this category are Permit Fees (User fees paid by large industrial and commercial business owners connected to the sewer system and Capital Facility Capacity Charges (CFCC) (a one-time charge imposed at the time a newly constructed building or structure is connected to the Sanitation District system). The Sanitation District policy has been to focus on cost recovery while keeping fees as low as possible.
- Property Taxes: The Sanitation District receives a share of the basic property tax levy proportionate to what was received in the 1976 to 1978 period less $3.5 million allocated to school districts. These funds are dedicated to the payment of debt service.
- Other Revenue: Other Revenue includes Interest Earnings, Intra-District Transfers and small revenue sources.

Portfolio Management

The Sanitation District Investment Policy is governed by three tenets:

- Safety: The safety and preservation of principal is the foremost objective of the investment program. Investments shall be selected in a manner that seeks to ensure the preservation of capital in the overall portfolio. This will be accomplished through a program of diversification and maturity limitations.
- Liquidity: The investment program will be administered in a manner that will ensure that sufficient funds are available for the Sanitation District to meet its reasonably anticipated operating expenditure needs.
- Return on Investments: The Sanitation District's investment portfolio will be structured and managed with the objective of achieving a rate of return throughout budgetary and economic cycles, commensurate with legal, safety, and liquidity considerations.

The Sanitation District's investments are separated into two distinct portfolios, Long-term and Short-term, with a primary focus on the Long-term portfolio.

The Long-Term portfolio always focuses on four elements, duration, sector allocation, term structure, and security selection.

Duration

- Typically, the Sanitation District keeps the duration of a portfolio 'close' to the benchmark duration as we feel the benchmark duration is consistent with the risk tolerance of the strategy.
- The investment policy of the Sanitation District stipulates the average duration must not exceed 60 months and be within 80-120% of the benchmark.
- Historically the deviation of the long-term portfolio versus the benchmark is close to 5%. Large deviations in the duration of the portfolio compared to the benchmark are an anomaly.

Sector Allocation

- The Sanitation District takes an active approach to asset allocation, differentiating our holdings versus the benchmark, with typically a modestly higher risk exposure compared to the benchmark.
- Some of the asset classes we find more attractive in the current investing environment include Corporate notes, Asset Backed Securities, and Treasury notes relative to the Agency and Supranational sectors.
- The sector allocation of the portfolio will evolve over time as our outlook for the various eligible investment options changes.

Term Structure

- The Sanitation District manages the term structure of the portfolio by focusing on either a bullet, ladder or barbell structure, relative to the benchmark.
- For most of 2018 the structure was gravitating towards more of a bullet structure in light of the change in the sharp of the yield curve, with short term interest rates moving higher at a greater velocity than longer maturity securities.
- Currently, with the yield curve very flat, we are migrating back towards more of a barbell structure, with new purchases focused at the short and long end of the eligible maturity distribution. We also find the middle to the maturity distribution, near the three-year maturity point, to be the most expensive from an absolute and relative value perspective, further supporting the barbell structure.

Security Selection

Within the Corporate and Asset Backed sector, the Chandler team focuses on adding stability to improve credits to be consistent with the overall investment objective of safety, liquidity, and return.

- As a Corporate holding becomes more seasoned, with a short maturity, it is often utilized as a 'source of funds' to facilitate new holdings in the portfolio.
- Typically, Asset Backed securities are held to maturity, but in the event of a liquidity need and/or a deteriorating credit situation we would look to reduce the exposure.

The Sanitation District allocates to the Agency and Supranational asset classes when we find the spread over a like maturity Treasury notes to be attractive.

- Considering the lack of issuance in the Agency sector since the financial crisis, the relative value of the sector has become more challenging.
- The Sanitation District has a core view that the Supranational Asset class should offer a modest spread concession to the Agency sector, and the team is typically active in the sector when the additional spread pick-up is compelling.

Across all asset classes, the Sanitation District will remove exposure to a security that is faced with a deteriorating credit situation and/or trading at an irrational valuation where a swap into an alternative security will be beneficial to the portfolio over a reasonable investment time horizon.

Debt Management

Due to the magnitude of the capital improvement program, the Sanitation District has utilized a combination of user fees, property taxes and debt to meet its total obligations and maintain generational equity.

It is the Sanitation District's policy not to issue any new additional debt for any existing obligations. However, the Sanitation District will actively review opportunities to refinance existing debt where possible provided the new refinancing results in a lower total cost and/or shortens the length of the obligations.

The primary debt financing mechanism used is Certificates of Participation (COP). COPs are a repayment obligation based on lease or installment sale agreements. As of July 1, 2019, the total outstanding COP indebtedness was $973 million with a blended interest rate of 3.05%. It is anticipated that the debt will be paid off by 2044.

Future Policy Statement

The Sanitation District will effectively manage its revenues and expenses to support all OCSD operating and capital activities while maintaining a fair and reasonable rate structure. The Sanitation District will maintain reserves and available resources to ensure the access to funds as needed and guarantee payment of all outstanding debt issuances. The Sanitation District will manage its investment by focusing on safety, liquidity and return on investment, in that order of priority.

Initiatives to Support Progress Toward the Policy Goal

- Maintain a rate setting program that keeps OCSD in the lower third of our comparative agencies.
- Maintain a "Pay as You Go" approach to fund current operating expenditures.
- Maintain a portfolio management approach that focuses on safety, liquidity and performance in that order.
- Continually look for ways to reduce total debt payments without lengthening its term.
- Ensure that no new debt issuances are used to support the currently programmed capital expenditures and that all existing debt is paid off by 2044.

Asset Management Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) will assess and manage the collection system and treatment plant systems and assets to improve resilience and reliability while lowering lifecycle costs. This will be accomplished through adaptive operation, coordinated maintenance and condition assessment, and planned capital investment. Staff will balance maintenance, refurbishment, and replacement strategies to maximize useful life, system availability and efficiency.

Background

The Sanitation District is a regional governmental agency principally chartered to protect the public health through collection and treatment of wastewater. The governing Board of Directors has defined this role to include the recovery and utilization of resources from wastewater for the public good as a part of that mission. The environmental impact mitigation of the human activity of 2.6 million people and the natural drainage of the 471 square miles the Sanitation District serves is our principal concern.

The Sanitation District owns and operates extensive facilities to achieve its mission. The Sanitation District estimates the replacement value of the civil, mechanical, and electrical assets in its collection system, Plant No 1 in Fountain Valley, and Plant No. 2 in Huntington Beach to be nearly $11 billion. The Sanitation District has been building the piping, pumping, and treatment infrastructure it utilizes for more than sixty-five years. It is necessary to expand, renew, replace, demolish, and rebuild components of the system to deal with wear and tear and meet new challenges.

The early years for the Sanitation District were characterized mostly by capacity expansion to meet the challenges of increased flows as the county grew. The late 1970s to the 2000s were more defined by improved levels of treatment. The last ten years have been focused on increasing the level of resource reuse. One of the key success factors for the Sanitation District has been the ability to upgrade and repurpose its operating facilities to accomplish high levels of treatment and reuse.

Current Situation

The Sanitation District is a highly planned, forward-looking organization. The collection system and each of the treatment plants are broken down into granular functional parts. Each part is well defined and future requirements are estimated. The Sanitation District has a detailed understanding of what is owned, what condition it is in, and how it is capable of performing.

The collection system is made up of independent pipe networks that were installed by the former independent sanitation districts to deliver flow to the joint treatment works. Generally speaking, the natural watershed drainages in the service area are served by major trunk sewer systems. The Sanitation District has worked with member city and agency staff to understand future development plans, flow estimates, and has collected historical inflow and infiltration rates during wet weather events to assure adequate flow carrying capability exists in each trunk sewer system. The Sanitation District also factors in the effects of drought and lower domestic water usage rates to make sure the sewers operate properly at low-flow rates.

The treatment plants are broken down into the discrete process units that make up the whole. Each plant has a headworks unit that brings in flow and does preliminary treatment, a primary treatment unit which does gravity settling, multiple biological secondary treatment systems, solids handling and dewatering, power generation and distribution utilities, water and air system utilities, and an outfall system to release treated water to the ocean. Each plant can treat 320 million gallons per day of wet weather flow, but only 185 million gallons total on average is treated. The Sanitation District must always maintain the ability to treat both the average flow and peak wet weather flow.

The Sanitation District understands that every asset has an expected life. Electrical systems are generally limited by component obsolescence to 20 years of life. Mechanical and coating systems are also generally limited by erosion, corrosion, and wear to 20 years of life. Civil structures and pipes are generally limited to 60 to 80 years of life if maintained on a regular basis.

With this in mind, the Sanitation District has created a facilities master plan that plans to renew or replace facilities on this regular basis. Collection system projects are driven by growth projections or condition findings. Pipes are upsized or renewed based on flow projections, corrosion observation, coating system failure, or the ability to increase reclamation. The 15 regional pump stations are renewed on a more frequent basis due to the mechanical wear and tear and electrical component obsolescence needs, about every 25 years.

The master plan for the treatment plants is much more dynamic. In addition to the electrical, mechanical, and civil asset considerations, there is also the need to meet new requirements. The new requirements are driven by regulatory agencies or by the Board of Directors to change a discretionary level of service. Examples include: capacity demands (more water, more solids), lower discharge requirements (lower BOD/TSS to the outfall, lower nutrients to the ocean), more water for reclamation, better energy conversion of solids, and many more. The 2017 Facilities Master Plan took a snapshot in time looking at the anticipated needs and levels of service to lay out a detailed project plan to morph the Sanitation District infrastructure over time to meet the expectation. Renewal or replacement projects with costs and schedules were laid out for each individual unit of the treatment plants to address capacity, condition, level of service, and anticipated new regulatory drivers.

Future Policy Statement

The Sanitation District will continue to invest in the infrastructure necessary to meet its mission. The Sanitation District will seek to provide its required level of service at the minimum lifecycle cost for its collection and treatment systems. The 2017 Master Plan was the snapshot basis of the Capital Improvement Plan, but the Asset Management Plan is the means to update and modify the Capital Improvement Plan to meet new requirements and conditions as time goes by.

The Sanitation District will understand in a transparent way: what it owns, the condition of those assets, the capacity of collections and treatment required, the level of service required by its regulators and Board of Directors and will anticipate new regulations that may require system improvement. This understanding will drive coherent operations, targeted maintenance, and capital investment strategies to assure resilient, lowest lifecycle cost compliance with the requirements.

Operations is committed to optimizing the operation of the systems to extend equipment life and minimize energy and chemical utilization, while meeting all regulatory and level-of-service requirements. Maintenance is committed to maintain the installed assets in a ready state for operations. Maintenance will seek to balance individual component preventive maintenance, repair, and renewal in harmony with the Capital Improvement Program (CIP). The CIP is based on the Master Plan, modified by the annual Asset Management Plan, and will execute the projects to install, renew, or replace trunk sewers or treatment plant units on a scheduled basis.

Asset Management at the Sanitation District is the living management of the operation strategies, maintenance plans, and implementation of the Capital Improvement Plan. The Sanitation District will find creative ways to maximize asset life or meet new capacity or level of service goals through operations and maintenance. The Sanitation District will annually reassess its condition, capacity, level of service, and regulatory conditions to drive operations and maintenance practices and modify the Capital Improvement Plan projects.

Initiatives to Support Progress Toward the Policy Goal

- Create an annual Asset Management plan documenting the condition of the collection system and treatment plants, and upcoming maintenance or capital projects.
- Coordinate the efforts of operations, collections, mechanical maintenance, electrical maintenance, instrument maintenance and engineering through process teams to assure the Sanitation District's resources are focused on the high priority work functions.
- Maintain a 20-year forecast of all CIP projects needed to maintain or upgrade the Sanitation District's nearly $11 billion in assets on a prioritized risk basis to establish rate structures.

Cybersecurity Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) must maintain adequate cybersecurity (information technology security) techniques that protect computer assets, networks, programs, data, and industrial control equipment from unauthorized access or attacks that are aimed for exploitation.

Background

Developing an effective, sustainable cybersecurity program is a pressing challenge for organizations of all sizes. The reasons behind the scope of the challenge are many. Cyber risk continues to grow at an exponential rate with routine attacks from nation states, criminal elements, hacktivists, and insider threats. The bottom line is cybercrime pays. The booming cybercrime economy is productizing malware and making cybercrime as easy as shopping at Amazon. With this easy access to cybercriminal tools and services, enterprises are experiencing rapid increases in the volume, scale, and sophistication of cyberattacks. Complex and dynamic information security disciplines are subject to continuous changes in the business, technology and threat environments. Many organizations will struggle to implement security programs that support continuous improvements in this challenging environment.

Current Situation

The Sanitation District has evolved over recent years from dedicating less than half of a position towards cybersecurity, to one position, to currently two full-time positions. The Sanitation District's cybersecurity portfolio consists of strategic policy management, defense in depth practices, periodic risk assessments, ongoing awareness communication and operational (e.g., security monitoring and incident response, threat and vulnerability management, user provisioning) processes. For example:

- Cybersecurity Awareness and Training Program - The Sanitation District understands that our employees are our best line of defense in protecting and defending our enterprise from attack. We have built a comprehensive security awareness program by focusing on four critical functions: phishing attack simulations and reporting, quarterly education requirements, targeted training for IT developers and SCADA engineers, and pervasive communications utilizing internal communication tools.

- Vulnerability Management — IT staff subscribe to and monitor security advisories and threat bulletins from Microsoft, US-CERT, ICS-CERT, KnowBe4, Cisco, and other vendors to understand and manage new vulnerabilities. All internet accessible servers and applications are scanned weekly for vulnerabilities and remediated as necessary. Microsoft operating system and application patches are deployed monthly while third party updates are deployed weekly. We use a vulnerability platform for continuous assessment of our security and compliance posture.

- Intrusion Detection and Response — We have implemented several security solutions to be able to detect, prevent and respond to malicious network activity. These include firewalls, intrusion prevent systems, web security gateway, and next-generation anti-malware. In addition, we also have user behavior analysis tools to identify insider threats and ransomware activity.

- Privileged Access Management Program — We use a privilege access management solution to remove and manage local administrative rights on workstations/servers to prevent lateral movement. The solution is also used to protect, control, and monitor privileged access across files and systems.

- Backup and Restore Capabilities — IT practices a 3-2-1 backup strategy:

  3 – Keep three copies of critical data
  2 – Have your data on two types of media
  1 – One copy must be offsite and offline

Restores are performed on at least a weekly basis in response to customer incidents. Disaster Recovery Testing is performed monthly by selecting a major system and testing restore capabilities of that system to our secondary treatment facility, as well as our remote site. We sandbox the restores and provide access to our application subject matter experts to conduct application-specific testing. These tests are logged and kept for auditing and management purposes.

- Security Incident Response — An incident response plan is an organized approach to handle a cyberattack. We have developed an incident response plan, playbooks and procedures for various attacks as well as trained IT security staff. In addition, there are external contacts we can call for assistance including the FBI, Department of Homeland Security and organizations that specialize in incident response like Mandiant, Cylance, and Microsoft.

- Security Assessments — The purpose of a security assessment is to identify the current security posture of a system, network, or organization. The assessment provides recommendations to improve the security posture by mitigating identified risks. Our goal is to do one or two a year. The two most recently conducted assessments are the Office 365 Security Assessment from Microsoft in April 2019 and the Center for Internet Security Control Gap Assessment in July 2018.

Future Policy Statement

The main objective of our information security program is the establishment of a continuous, iterative regimen of planning, building, running and governing security capabilities that are derived from business requirements. Our security program cannot be a static entity. It must be adapted and continuously refined to keep pace with the ever-changing threat environment and changes in how the Sanitation District adopts digital business practices. Cybersecurity incidents are inevitable. Mistakes and/or a lack of preparation in the response can have serious repercussions. The ability of an organization to respond effectively to a security incident is a direct result of the time spent preparing for such an eventuality. If you fail to prepare, then you effectively prepare to fail. The Sanitation District will be prepared. This will be accomplished by the following proposed initiatives.

Initiatives to Support Progress Toward the Policy Goal

- Conduct various tabletop exercises to determine the organization's ability to respond to a targeted cyberattack and to improve the quality of the response, should an attack occur.

- Evaluate, enhance and monitor network security including activities to protect the usability, reliability, integrity and safety of the network by developing Security Operations Center capabilities that support continuous monitoring and is responsible for the continuous threat protection process.

- Conduct a comprehensive third-party cybersecurity operations assessment (Red Team). A thorough Red Team engagement will expose vulnerabilities and risks regarding:

- Technology — Networks, applications, routers, switches, appliances, etc.

- People — Staff, independent contractors, departments, business partners, etc.

- Physical — Offices, warehouses, substations, data centers, buildings, etc.

Property Management Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) owns and operates assets throughout its service area located in property owned in fee, through easements and in the public right-of-way. The Sanitation District will identify and protect all of its property rights to assure that its assets are not encumbered or encroached upon so that the facilities may be properly operated, maintained, upgraded, and replaced.

Background

The Sanitation District owns and operates more than $10 billion in assets. A portion of those assets include buildings, easements, rights of way and other encroachments. OCSD has recently sold and purchased property to support its efforts. The Sanitation District does not maintain expertise in the real estate discipline. As these transactions are limited and not core to OCSD, it has been determined that it is more cost effective to augment the Sanitation District resources with contracted specialized real estate services.

Current Situation

The Sanitation District manages its physical property and property rights. Additionally, it manages landscaping, building maintenance, security and building maintenance. District staff primarily manages these activities.

Future Policy Statement

The Sanitation District will effectively manage its assets and proactively research and maintain all encroachments, encumbrances and easements. Many of these activities are not core to OCSD's mission. The Sanitation District will maintain sufficient resources using a combination of contracted specialized real estate and property management services and internal staffing. Although OCSD is not in the business of managing property as a revenue enhancement or core activity, it does own and operate millions in physical property and property rights.

Initiatives to Support Progress Toward the Policy Goal

- The Sanitation District will review its property rights to identify encroachments or encumbrances that restrict operation, maintenance, inspection or emergency repair access. Staff will work with identified parties to remove encroachments or encumbrances.
- Staff will consolidate real estate and property management activities to maximize its resources and effectiveness. With the completion of the property rights and real estate assessments, the Sanitation District will evaluate the various resources available and develop an appropriate resource management plan to assess and maintain its property assets

Environmental Stewardship

Energy Independence Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) will strive to be a net energy exporter. Electrical, thermal, and methane gas generation will be maximized. Energy utilization will be minimized using sound engineering and financial principles.

Background

The Sanitation District must balance the impacts of its operation between land, air, and water. For example, as a water focused utility, the Sanitation District seeks to produce the cleanest water possible to minimize the impacts of human activity on the ocean, as well as to renew freshwater resources for further domestic and commercial use. A natural result of cleaning this water is the separation and concentration of constituent solid and gaseous materials. These solid and gaseous products can impact land and air. The balance of impact on land, air, and water are shifted by application or creation of energy through chemical, biological, or thermal conversion techniques.

The Sanitation District is also committed to be a good neighbor. As such, significant amounts of energy are spent capturing and converting odorous air and vapor streams. The Sanitation District has pursued a comprehensive program to cover and seal its liquid and solid processes. Air streams are ducted to large fans which move thousands of cubic feet of foul air per minute through chemical, biological, and activated carbon beds to scrub the air of odorants that are regulated or may be perceived as a nuisance by the community.

The Sanitation District has utilized an anaerobic digestion process that relies on biological conversion of solid organic material to methane and carbon dioxide gas. The methane is converted to electrical and heat energy in power plants for internal use. The Sanitation District's secondary treatment system is another example of using energy to convert water impacts to air emissions. Approximately 23% of the Sanitation District's energy usage within the treatment process is devoted to aerating water so biological agents can convert soluble organic material to nitrogen and carbon dioxide. The generation of energy itself creates an impact on the environment in air and thermal emissions.

Current Situation

The potential exists to further shift environmental impacts between land, air, and water through the utilization of energy. The Sanitation District is an environmental steward that seeks to balance and minimize overall impact by efficiently utilizing the energy inputs to its processes and maximizing the harvesting of energy available in the incoming wastewater.

On the energy use side of the ledger, the Sanitation District invests prudently in lifecycle energy efficiency to minimize the use of energy to achieve its mission. Pumping systems to lift water and move material for premium efficiency. Thermal energy is harvested from power production for use in the process and to heat and cool occupied buildings. Aeration compressors and diffusers are selected by overall efficiency. Lighting systems are upgraded over time to more efficient technologies and lighting levels are balanced between safety and security needs versus energy utilization and light pollution concerns. Facility designers and operators make careful choices regarding the utilization of every watt of electricity, BTU of heat, and therm of gas consumed.

On the energy generation side of the ledger, the Sanitation District seeks to maximize the internal creation of energy. The primary source of energy creation is in digester gas, also called biogas, which is mostly methane. Organic solids collected and concentrated in the water treatment processes are converted biologically to biogas composed of 65% methane, 34% carbon dioxide, and other trace constituents. The Sanitation District has been using this technology since the 1950s. Research has been ongoing since that time to maximize the production of digester gas. Some of the areas of research include improved mixing and heating; improved feeding; chemical addition to limit trace pollutant production; introduction of food waste; injection of fats, oils, and grease; and cell lysing.

The Sanitation District cleans the biogas and converts this biogas into electricity, heat, and exhaust gas. The exhaust gas is regulated ever more tightly for nitrogen compounds, carbon monoxide, particulates, and volatile organic compounds which require costly and performance degrading engine control technologies. This is another example of an air impact/energy trade off. These internal systems of energy harvesting provide roughly 66% of the Sanitation District's electrical demand and 92% of the Sanitation District's thermal demand in the treatment plants. The Sanitation District can shift the digester gas between treatment plants via an interplant pipeline and has roughly 8 MW of additional generation capacity if more gas is produced.

In addition, the Sanitation District is installing electrical battery storage capacity. This system is primarily in place to lower operating cost by importing electricity for charging during low-cost nighttime hours and discharging that energy for process use during peak-cost hours. The slight energy loss due to system inefficiencies is outweighed by the cost savings and benefit to the region by lowering the peak demand of the Sanitation District by up to five megawatts.

Future Policy Statement

The Sanitation District seeks to be energy independent by self-generating all the electrical and thermal energy necessary to sustain its operations. This will be accomplished by economically minimizing its utilization requirements and maximizing energy harvested from the wastewater it receives. The Sanitation District will also study and use photovoltaic cells in non-process areas where it makes economic sense. Energy independence will improve the Sanitation District's environmental impact and improve its operational reliability and resiliency.

When the Sanitation District has achieved energy independence, it will seek to make excess biogenic or green energy available to external users via gas sales, power grid exports, or transportation fuels. The State of California has set goals for renewable energy utilization for electrical production and hydrogen transportation fuels. The Sanitation District's biogas is viewed favorably in these industries to meet the State of California targets. The Sanitation District is working very diligently and creatively to maximize the production of gas and reduce its own energy needs, but energy independence is the first goal which has not yet been met.

Staff recommends that innovative research continue to maximize energy harvesting and to minimize energy inputs first to make the Sanitation District energy independent in the most basic mission of protecting the public health and the environment. Once this has been achieved, excess energy can be made available for meeting the State of California's goals for the electrical grid and transportation fuels.

Initiatives to Support Progress Toward the Policy Goal

- Maximize the anaerobic digestion conversion of organics to methane through receipt of food waste and operational techniques.
- Investigate and install energy storage and photovoltaic systems where practical to achieve energy independence/resilience.
- Continue to support the conversion of biomethane into electricity and heat for process use. Improve systems as necessary to comply with air regulations.

Climate and Catastrophic Event Resilience Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) aims to design, maintain and operate valuable wastewater assets that withstand or adapt to adverse conditions in a reasonable manner that is both cost-effective and sustainable for present and future generations. These adverse conditions include heavy rains, flooding, sea level rise, earthquakes, tsunamis, extreme heat, wildfires, and electrical grid interruptions.

Background

The Sanitation District owns and operates extensive wastewater collection and treatment facilities valued at nearly $11 billion. The Sanitation District service area faces special challenges because of the geographic location of its facilities. These challenges include: its position on and near seismic risk factors, its proximity to the Pacific Coast, adjacency of its treatment facilities to the Santa Ana River, and being served by increasingly fragile energy utilities.

The Sanitation District's facilities are situated on or near several seismic risk factors. Plant No. 2 is located directly on top of the Newport-Inglewood fault. Both plants and the collection system are influenced by many adjacent major and minor faults capable of delivering damaging energy. Both of our treatment plants and the majority of our collection system sit on top of silty, alluvial soils that can have the effect of amplifying the earth motion and risk liquefaction during a seismic event. The Sanitation District has invested significantly over the last 50 years to improve the soils, foundations, and structures to mitigate these seismic risks. As geotechnical and structural knowledge and building codes progress, upgrades and facility replacements will be necessary.

Another seismic risk associated with having a treatment plant and several pump stations located on the Pacific Coast, is the risk of tsunami inundation. The Sanitation District has been working with and reviewing the plans of the City of Huntington Beach and the City of Newport Beach to understand and quantify this risk. The American Society of Civil Engineers (ASCE) has created a new standard, ASCE 7-16, to layout design parameters for lateral forces and inundation zone associated with potential tsunamis.

The Sanitation District understands that climactic factors we face change widely over time. The Sanitation District's systems must perform in extreme wet weather situations (atmospheric rivers), extreme dry weather conditions (drought), extreme tidal conditions (king tides, rising sea levels), as well as high and low temperature extremes. The Sanitation District generally designs for historical and expected "average conditions" for optimal performance but must also assure operations for extreme weather events.

The Sanitation District serves a critical public health role. Its operations must be reliable 24 hours per day, 365 days a year. Electricity, and to a lesser extent natural gas, are necessary for pumping and treatment operations. Both electricity and natural gas supplies have become increasingly vulnerable to interruption. Electricity deliveries are more vulnerable due to wildfire outage criteria, loss of local generation assets, aging infrastructure and extreme weather events. Natural gas supplies are more vulnerable due to the loss of local storage capacity, aging infrastructure, line corrosion, and more stringent regulatory requirements. The Sanitation District has significant capacity to self-supply critical energy requirement for extended periods.

Current Situation

The Sanitation District has spent considerable effort quantifying its seismic, climate, and utility supply risks. Several key studies have been initiated and will be completed in the next two years. The most acute risk factor faced by the Sanitation District is seismic risk. Climate and utility supply risks are more accurately described as chronic risks.

Seismic risk factors include ground shaking, liquefaction, lateral spreading, and fault rupture. Both treatment plants are situated in historic riverbed with poor soil conditions. The collection system

is vulnerable to failures during seismic events. The state of the art for seismic design has changed greatly over the Sanitation District's history and will continue to do so. Many of our critical structures were designed or installed prior to the great learning that occurred in the earthquakes of the 1990s. Significant effort has been expended to better characterize the soil conditions under our treatment plants and pump stations. Projects to refurbish or replace existing unit processes are, or soon will be, scoped and budgeted to provide enhanced seismic resilience. These measures include soil mixing to stiffen the soil, various foundation designs and building structure improvements.

Tsunami resilience and flooding protection can go hand in hand. To a great extent, these two risk factors can be mitigated in the same way. The Tsunami guidelines for inundation in ASCE 7-16 are a reasonable peer reviewed standard. By complying with this standard for Huntington Beach and Newport Beach, the Sanitation District will be reasonably prepared for flooding caused by extreme storm events and conservative sea level rise estimates at Plant No. 2 and pump stations in the City of Newport Beach.

The Sanitation District has also expended significant effort to prepare for the effects of weather extremes on its operations. Extreme wet weather impacts operations. Inflow and infiltration during intense storm activity have multiplied average dry weather flow rate by up to three times in recent years. The Sanitation District has significant wet weather capacity and will continue to maintain a 640 million gallon per day influent and outfall capacity which is roughly 3.5 times our average dry weather flow. Historically high rains as seen in 1863 and 1938 will push our systems to the limit.

The Sanitation District has also adapted its systems to perform in extreme dry weather. The Sanitation District in cooperation with OCWD operates the largest potable water reuse system in the world. This is made possible by replumbing our treatment plants and adding new smaller pump stations to deal with extreme low outfall flow rates in the morning hours. The Sanitation District also has, and continues to grow, the ability to shift influent flow between its treatment plants which creates additional resilience for risk factors.

Finally, on the topic of utility supply, the Sanitation District built redundant supplies for its most critical needs: electricity, natural gas and water. The Sanitation District has maintained three sources of electricity supply for more than 25 years. The treatment plants can be supplied with power from Southern California Edison, the Sanitation District's Central Generation Plants or on-site diesel generation systems to maintain basic operation to protect public health. In terms of natural gas, the Sanitation District has been producing bio-methane through anaerobic digestion since the 1950s with enough capacity to provide electricity and necessary process heat.

Future Policy Statement

The Sanitation District will continue to build and improve its facilities to meet the seismic, climate and energy infrastructure risks that it faces with a long-term, planned approach. Acute life-safety risks that are identified or facilities that are damaged or fail in a catastrophic event will be addressed very quickly. However, it is not practical to update $11 billion in facilities every time a code is updated, or new climate change estimate is released. The Sanitation District will stay abreast of code and climate change estimates as they occur and will implement improvements or replacements to facilities on a long-term basis in line with its asset management practices. The Sanitation District generally plans to refurbish or replace its mechanical and electrical assets every 20 to 25 years with an average capital improvement investment of $250 million per year.

The Sanitation District facilities are designed to meet industry codes. As time goes on and codes are updated, it is not required to upgrade existing facilities to meet those latest codes unless there is a mandate to do so, or a risk in not doing so is recognized. The Sanitation District will accept some incremental risk in having some facilities that are not necessarily compliant with latest building codes or subject to increased greater risks until a project to rehabilitate or replace these facilities is developed. All of the Sanitation District's facilities have a planned life span with two to three refurbishment cycles. Identified seismic or flooding vulnerabilities may drive a replacement versus refurbishment decision in the normal capital planning process.

The Sanitation District will continue to aspire to energy independence which will help mitigate vulnerabilities to loss of electrical and gas utilities. In addition, the Sanitation District will continue to maintain third level, diesel generator, electrical supply capability for critical loads. On-site diesel storage will provide up to three days of power to run the plants. Pump stations diesel generation will be site specific in its design based on flow risks, hydraulic storage capacity, and site constraints. Either on-site generation or quickly deployable mobile generators will provide emergency power for up to days at a time.

Initiatives to Support Progress Toward the Policy Goal

- Complete an engineering study of the seismic vulnerabilities of the treatment plants. Incorporate necessary upgrades into future capital improvement projects.
- Complete the biannual high flow exercise to assure readiness for a high flow event. Maintain a higher level of readiness October 15 through March 15 and in advance of predicted significant rain events.
- Study the potential impact of tsunami and changing climate conditions including flooding due to high tides and heavy rain events.

Food Waste Treatment Policy

Summary Policy Statement

The State of California limits the volume of organic waste that may be diverted to landfills. The Orange County Sanitation District (Sanitation District) will collaborate with the County of Orange, other local agencies, and waste haulers to find ways to beneficially reuse food waste, a type of organic waste to assist cities in our service area in meeting their diversion requirements while increasing the Sanitation District's energy production.

Background

Whether supplying secondary treated wastewater for the Groundwater Replenishment System, creating renewable energy in the form of biogas from anaerobic digestion to produce electricity, or benefiting from the use of biosolids as a soil amendment, the Sanitation District is a resource recovery agency committed to providing resilient and reliable wastewater treatment service while protecting the public health and the environment.

In recent years, there has been a significant change in the regulatory landscape in California related to the diversion of organics such as food, green material, wood, paper, biosolids, digestate, and sludges from landfills. Currently, much of the state's diverted organics are being composted or used as alternative daily cover on landfills. With the phaseout of organics as alternative daily cover, the regulatory shift is creating an organics market for the wastewater sector to provide a solution to manage organics such as food waste by way of co-digestion. There is an opportunity for the Sanitation District to produce additional biogas, reducing the need to purchase electricity from the local utility.

Anaerobic digestion is currently at the nexus of important State of California mandates, namely: (1) organics diversion from landfills (AB 1826 and SB 1383), and (2) increased renewable energy and fuels generation (SB 32 and SB 100). The primary alternatives for organics management are anaerobic digestion and composting — of which anaerobic digestion is the only process offering energy recovery potential. Over the next few years, California's cities and counties, along with municipal solid waste haulers, material recovery facilities, and landfills will need to develop collection, processing, and energy recovery infrastructure to address new state legislation and goals. Existing wastewater treatment plants such as the Sanitation District are uniquely positioned to play a role in the new organics marketplace since solid waste management facilities do not typically have anaerobic digesters, the energy recovery infrastructure in place, or experience regarding the management of biosolids for beneficial use.

In 2017, the Sanitation District completed a comprehensive Biosolids Master Plan (Plan) that provides a roadmap and framework for sustainable and cost-effective biosolids management options and future capital facilities improvement over a 20-year planning horizon. Considering the timeliness of the regulatory mandates requiring organic diversion from landfills and increased renewable energy, the Plan evaluated the feasibility of implementing a high strength organic waste receiving program involving the co-digestion of preprocessed food waste.

While food waste digestion appears to be feasible, the Sanitation District's existing infrastructure isn't well suited for receiving, handling, or digesting green waste. Current digester feed, mixing, heating, dewatering and truck loading facilities aren't designed to deal with cellulosic products in green waste. The highly fibrous material doesn't readily break down and clogs the various systems optimized for sewage sludge treatment. In addition, there are legal hurdles specified in the California Health and Safety Code, Section 4700, that must be addressed before the Sanitation District could operate a refuse transfer facility.

Current Situation

Project Viability

The Sanitation District's Plan concluded that the costs to construct and operate a food waste receiving facility could be offset by tipping fees charged to food waste processors/haulers and by additional power

generated from the increased digester gas production. The Plan recommended that the Sanitation District build an interim food waste receiving station immediately to take advantage of existing digestion and power generation capacity of approximately 150-250 wet tons per day at Plant No. 2. The Sanitation District will construct a more permanent facility in the future to coincide with the planned construction of new digesters at Plant No. 2, allowing an additional capacity to co-digest approximately 500 wet tons per day of food waste. The Sanitation District also has at least 6 MW of installed electrical generation capacity that can convert the produced digester gas to electricity and heat.

Based on these recommendations, in 2018 the Sanitation District's Board approved a project (P2-124) to construct an interim (10-15 years) food waste facility to receive, store, and feed preprocessed food waste slurry to the digester complex at Plant No. 2 to generate additional digester gas. This project will be designed to accept approximately 150 wet tons per day of preprocessed food waste and will produce approximately 15 percent more methane gas for on-site energy production, resulting in a greenhouse gas reduction of approximately 10,800 metric tons of carbon dioxide equivalent annually which is equivalent to the annual greenhouse gases generated by approximately 2,000 passenger vehicles. This is consistent with the Sanitation District's Energy Independence Policy which is to strive to be energy independent by minimizing energy utilization and maximizing useful energy recovery from the sewage it receives. The interim receiving station is scheduled to be completed in 2022.

The final biosolids product currently produced by the Sanitation District is anticipated to be largely unaffected by the addition of food waste slurry. Pilot testing conducted by the Sanitation District indicates that there will be increased gas production due to mixing sewage sludge and food waste feed stock, but the final biosolids product will remain largely unchanged.

A draft Preliminary Design Report was issued in June 2019 for the interim receiving facility which included a viability evaluation concluding that the project is economically justifiable based on project costs and anticipated tipping fees. Final Design work has started and among other important items, the tipping fee and food slurry specifications will be further refined and validated.

There are three large municipal solid waste haulers that have expressed interest in collaborating with the Sanitation District to provide preprocessed food waste for digestion. Of these, two haulers are located within the county and one is located outside the county. Another important partner for the Sanitation District is Orange County Waste and Recycling (OCWR). The Sanitation District has met with OCWR and they have expressed interest in partnering with the Sanitation District to find local solutions to meet SB 1383's organics diversion mandate including in-county biosolids management, composting, food waste co-digestion, and biogas production.

Future Policy Statement

Food Waste Slurry

The Sanitation District will only accept a preprocessed food waste slurry. We do not have available land or air permits to handle, sort, and process solid or green wastes. The Sanitation District will work with other public agencies and waste haulers to develop an industry standard for food waste slurry that specifies water, organic, metal, plastic, and glass content requirements. A common specification for slurry will help all parties make investment decisions.

Food Waste Volume

The Sanitation District has identified available capacity within its infrastructure at Plant No. 2 to accommodate food waste conversion to energy. The processes impacted by food waste conversion are digestion, gas cleaning, gas compression, generation, process heating, biosolid dewatering and biosolids loading. These impacted systems have the capacity to accept 150 to 250 wet tons per day for the next ten years. Beyond ten years, the Sanitation District plans on upgrading its digestion, gas compression, and gas treatment systems. Based on the lessons learned from the interim system and the development of the food waste market, the Sanitation District plans to be able to accept up to 500 wet tons per day when the new digestion, gas compression, and gas treatment systems are completed.

The Sanitation District believes that the full implementation of the current regulations will create a food waste slurry market significantly greater than 500 wet tons per day in Southern California.

Tipping Fee Basis

The acceptance of food waste has the opportunity to more fully utilize the system capacity that already exists for the benefit of the Sanitation District's rate payers.

The Sanitation District staff will develop a base tipping fee rate schedule for Board of Directors' approval that meets the following criteria:

- Recover all capital costs to construct facilities within five years (this will allow the Sanitation District and waste haulers to properly invest in processing facilities);
- Recover all on-going costs including operating cost, maintenance cost, electricity usage, biosolids dewatering, and reuse costs;
- Food Waste will not be operated "for profit" but rather a cost recovered service with revenues offsetting rates and passed on to OCSD's rate payers.

Food waste generated and processed within the service area will be charged the base rate and will be prioritized over food waste from outside the service area. This is justified by the fact that the underlying infrastructure of the Sanitation District is already owned by service area rate payers. The Sanitation District contracts with service area waste haulers must provide for a pass-through savings to the Sanitation District rate payers. That means waste haulers may charge for collection and processing of food waste but must disclose to their City or Special District franchise partner the Sanitation District's tipping fees and negotiate pricing adjustments as necessary with City or Special District franchise partners.

If additional capacity exists, but isn't utilized by in service area users, then that capacity may be contracted by out of service area users at a premium to help offset the cost of the underlying infrastructure necessary to process the food waste.

The Sanitation District will pursue grant opportunities to the extent possible to reduce the overall capital and operating cost basis for the program to reduce the tipping fee base rate.

Initiatives to Support Progress Toward the Policy Goal

- The Sanitation District will accept a preprocessed food waste slurry from contracted waste haulers that will be fed to existing anaerobic digesters. The Sanitation District will charge a tipping fee to offset its costs for capital construction, operations, handling, maintenance, and biosolids disposal.
- Design, build, and operate a food waste receiving station. Create a specification for food waste slurry and contract with solid waste haulers to receive and process food waste.

Water Reuse Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) will seek to beneficially reuse all reclaimable water for potable, industrial, irrigation and environmental uses.

Background

For over 40 years, the Sanitation District and the Orange County Water District (OCWD) have partnered to beneficially reuse treated wastewater from the Sanitation District. OCWD, which serves roughly the same service area as the Sanitation District, manages and replenishes the groundwater basin in northern and central Orange County, ensures water reliability and quality, prevents seawater intrusion, and protects Orange County's rights to Santa Ana River water.

Beginning in 1975, the Sanitation District contributed treated wastewater from its Plant No. 1 to OCWD for the operation of Water Factory 21, which reclaimed the treated wastewater and injected it along with deep well water into the groundwater basin to prevent seawater intrusion. In the mid-1990s, OCWD needed to expand Water Factory 21. At the same time, the Sanitation District faced the challenge of having to build a second ocean outfall pipe to discharge treated wastewater into the Pacific Ocean. Both agencies collaborated to build an advanced water purification facility to resolve these challenges. This state-of-the-art facility, known as the Groundwater Replenishment System (GWRS), took the place of Water Factory 21, and began operation in 2008. The GWRS treats secondary treated wastewater from the Sanitation District Plant No. 1 to drinking water standards and uses the purified water for both injection and percolation, through injection wells and recharge basins, as source water to replenish the groundwater basin's drinking water supplies. With approximately 75 percent of the water demand in northern and central Orange County cities coming from the groundwater basin, GWRS supplements existing water supplies by providing a new, reliable, high-quality source of water.

While the original GWRS facility was initially constructed to supply up to 70 million gallons per day (MGD) of purified water, the facility was designed for an ultimate treatment and conveyance capacity of 130 MGD. The original GWRS design intent was to expand the GWRS facility in two phases — an initial and a final expansion of an additional 30 MGD of treatment capacity with each expansion. The GWRS Initial Expansion Project was completed in June 2015 and has been producing up to 100 MGD of purified water for groundwater injection and recharge. The Final Expansion of GWRS is scheduled to be completed in 2023 and will produce the maximum capacity of 130 MGD.

In addition to providing treated wastewater to the GWRS, the Sanitation District also provides treated water to OCWD's Green Acres Project, which provides recycled water for landscape irrigation at parks, schools, and golf courses; and industrial uses, such as carpet dying; toilet flushing; and power generation cooling.

Current Situation

The GWRS currently produces 100 million gallons per day of purified water — enough water for about 850,000 people. All of the Sanitation District's Plant No. 1 secondary effluent, between 120-130 MGD, is sent to OCWD for the GWRS and Green Acres Project. However, secondary effluent from the Sanitation District's Plant No. 2 and other non-reclaimable flows, such as brine from inland desalters and GWRS's reverse osmosis process, and the Sanitation District's process sidestreams, continue to be released into the ocean.

In 2016, the Sanitation District and OCWD jointly conducted the Effluent Reuse Study, which evaluated the feasibility of recycling the Sanitation District's secondary effluent from Plant No. 2 and identified projects required to achieve the final expansion of the GWRS. The GWRS final expansion effort will include implementation of projects to construct new, modified or rehabilitated facilities at Plant No. 2 to separate reclaimable flows from non-reclaimable flows; to equalize, pump, and convey secondary effluent from the Sanitation District's Plant No. 2 to the GWRS facility; and to treat the additional source water to produce 130 MGD of purified water.

Reverse Osmosis brine generated at the GWRS Initial Expansion is currently discharged into the ocean. The 2016 Effluent Reuse Study identified alternative brine management strategies such as evaporation ponds, deep well injection, and engineered wetlands. Evaporation ponds are land intensive and are also energy intensive when combined with a brine crystallizer to remove solids from highly concentrated brine system using heat and pressure. While the areas around both the Sanitation District treatment plants have the appropriate geology for brine injection, there are concerns with contamination of drinking water aquifers, and seismic risks due to the Newport-Inglewood zones near Plant No. 2. At this time, it does not appear economically feasible to provide alternative management strategies for the brine discharge.

In November 2016, the Sanitation District Board of Directors adopted the Second Amended and Restated Joint Exercise of Powers Agreement for the Development, Operation and Maintenance of the Groundwater Replenishment System and Green Acres Project, which committed the agency to continue supporting the GWRS and the Green Acres Project, and specifically, the final expansion of the GWRS. The implementation of the final phase of the expansion will be executed by multiple projects, some executed by the Sanitation District while the others executed by OCWD. Project costs related to GWRS are funded by OCWD, including $50 million reimbursement to the Sanitation District for its costs incurred to execute related projects.

By supporting the GWRS Final Expansion, the Sanitation District will be able to recycle all reclaimable wastewater generated in its service area and treated at its two treatment plants, and OCWD will have sufficient water to run the GWRS facility to full capacity.

Future Policy Statement

The treated effluent produced from the Sanitation District's Plant Nos. 1 and 2 is a valuable resource that can help boost local water resources and reduce dependence on imported water, while reducing the effluent discharged to the ocean. The Sanitation District will continue to seek opportunities for beneficial reuse of all reclaimable wastewater collected and treated at its facilities.

The Sanitation District will continue to support the completion of the final expansion of the GWRS in accordance to the adopted Second Amended and Restated Joint Exercise of Powers Agreement for the Development, Operation and Maintenance of the Groundwater Replenishment System and Green Acres Project. This includes providing secondary effluent as source water for GWRS free of charge; allowing OCWD to discharge brine via the Sanitation District's ocean outfall free of charge; leasing approximately 10 acres of land to OCWD at $1 per year for the GWRS Final Expansion project; allowing OCWD to discharge North and South Basin extraction well flows to the Sanitation District sewers; managing the design and construction efforts of the Plant No. 2 Headworks Modifications Project and the Plant Water Pump Station Replacement Project (OCWD will reimburse up to $50 million of project cost); managing and financing the construction of the Ocean Outfall Low Flow Pump Station at Plant No. 2 and the construction of Plant No. 2 primary and secondary facilities to allow segregation of non-reclaimable flows.

The Sanitation District will continue to maximize the delivery of secondary effluent available to GWRS and the Green Acres Project in order to maximize full production of purified recycled water for indirect potable reuse, and industrial and irrigational uses. The Sanitation District has been operating the Steve Anderson Lift Station to divert more flows to Plant No. 1. The two agencies regularly communicate and coordinate the Sanitation District operations and construction projects that may have impacts on GWRS operation and will continue this collaboration effort.

The Sanitation District has adequate flow to maximize the production of the GWRS through final expansion. Diversion of additional non-wastewater into the sewer system is unnecessary. Non-wastewater diversions create high flow risks during wet weather conditions and can introduce constituents of concern to existing water and biosolid reuse programs.

Initiatives to Support Progress Toward the Policy Goal

- Support the completion of the final phase of the Groundwater Replenishment System and maximize reclaimable wastewater availability to the Orange County Water District.
- Support Green Acres project water production to provide reclaimed water for industrial and irrigation uses.

Environmental Water Quality, Stormwater Management and Urban Runoff Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) will partner with storm water permittees to accept up to ten million gallons per day of dry weather urban runoff at no charge in order to improve water quality in streams, rivers and beaches as long as the constituents within the flow do not adversely impact the Sanitation District's worker safety, treatment processes, reuse initiatives, or permit compliance. The Sanitation District facilities are subject to significant flow increases during wet weather events and are not capable of accepting stormwater flow volumes.

Background

The Sanitation District's wastewater collection system is designed to be wholly separate from the region's stormwater systems, also referred to as storm sewers and/or storm drains. The Sanitation District implements a system-specific Sewer System Management Plan in compliance with the California Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ. In the Sanitation District's service area, most local sanitary sewer systems are owned by city municipalities and discharge into the Sanitation District -owned regional sewers. Similarly, many stormwater systems are also owned and maintained at the local level, referred to as municipal separate storm sewer systems or MS4. These publicly owned conveyances or a system of conveyances are designed to collect/convey stormwater, are not combined with sanitary sewers, and not part of the sewage treatment works. Stormwater runoff is water generated from precipitation events that flows over land or impervious surfaces including streets, parking lots, and building rooftops — this water does not return to groundwater basins, because it does not soak into the ground. This runoff accumulates pollutants from transportation, construction, industrial, and residential sources that can include trash or other solid waste, chemicals, oil, and other sediments. MS4 stormwater that is not captured for reuse, typically discharges into regional systems, most notably flood control channels (e.g. the Santa Ana River), that subsequently flow to the ocean and are regulated by the National Pollutant Discharge Elimination System (NPDES) that also regulates the Sanitation District's discharge to the ocean.

Due to the design and operation of local and regional sanitary sewers, there is not system capacity to allow 'wet weather' stormwater discharges to the sewer. Excessive flows into the sewer beyond its design capacity can lead to sanitary sewer overflows (also called SSOs), spills, and potential sewage backups. The Santa Ana River can provide massive storm-flow capacity at approximately 22,000 cubic feet per second (cfs) of water, and the Delhi Channel at 325 cfs, as compared to the peak wet weather flow for both the Sanitation District Plant Nos. 1 and 2 combine to less than 1,000 cfs — much of which is utilized for sanitary sewer service at all times. During 'dry weather', stormwater systems collect flow from 'dry weather urban runoff' activities, such as residential or industrial use, irrigation, water released from previous precipitation, among others. Most sanitary sewer systems are gravity draining, that is, most non-industrial facilities passively drain to the sewer and do not typically take action to commence discharge of wastewater. As a result, it's important that facilities are constructed in such a way that they will not drain active stormwater or urban runoff flow to the sewer, especially during rain. Additionally, stormwater best management practices (BMPs) typically dictate that the generation of contaminated stormwater should be mitigated through proper facility design including berms and grading.

The Sanitation District's Wastewater Discharge Regulations Ordinance, which sets quality standards and requirements for facilities discharging to the Sanitation District, includes language to prohibit sewer users from discharging groundwater, stormwater, surface runoff, or subsurface drainage to the sewer without written authorization or a permit issued for such a purpose. In addition to the concerns related to insufficient capacity in the Sanitation District's sewer collection system, there is a concern that uncontrolled discharge to the sewer from these types of systems can introduce pollutants that may cause issues in the Sanitation District's treatment and reclamation plants, discharge to the ocean, or affect the agency's ability to recycle water or reuse biosolids. The Sanitation District's Ordinance was recently revised

to clarify these restrictions and include a prohibition on drainage from non-domestic surface and floor drains to address these types of uncontrolled discharges.

However, given the public health and environmental protection issues that may arise from runoff-carried pollutants being transferred into the Sanitation District's coastal beaches and waters, in April 2000 the Sanitation District initiated a permitting program to assist in the economical and practical control of these pollutants during dry weather conditions.

Following the Sanitation District's sponsored legislation (AB 1892), the Sanitation District's charter was amended to authorize the Board of Directors to adopt Resolution No. 00-04 establishing a dry season urban runoff policy that allowed local agencies to obtain a Dry Weather Urban Runoff Permit to discharge to the Sanitation District. Agencies could apply for this permit type where there was not an economically or practically feasible alternative (i.e. discharge to storm drain, reclamation/reuse, etc.) to discharging dry weather urban runoff to the sewer, and the discharger met other conditions including complying with the Sanitation District's Wastewater Discharge Regulations Ordinance.

In September 2000, the Sanitation District modified the Dry Weather Urban Runoff Policy (Resolution No. 00-22) to cap discharges received to ten million gallons per day (MGD). Furthermore, the policy revision established the waiving of fees associated with the program until discharges exceeded four MGD, or until the policy underwent future revisions. There were a number of other modifications to the policy that added facility and compliance requirements for Dry Weather Urban Runoff permittees.

The Sanitation District Board Resolution No. 01-07, adopted in March 2001, added language to the policy clarifying conditions in which the Sanitation District would and would not be indemnified against liability associated with diversion systems. Indemnification is a critical component of Dry Weather Urban Runoff agreements necessary to address the risks posed to the Sanitation District associated with water quality, flooding, trash, infrastructure damage, and other concerns. In June 2013, the Sanitation District's current policy was established when Resolution No. 13-09 was adopted. This included a revision where upon reaching a dry weather urban runoff influent rate of nine MGD, the Sanitation District will take action to reevaluate the policy.

In addition to Dry Weather Urban Runoff Permits, the Sanitation District's Ordinance allows for normally prohibited wastes such as groundwater, stormwater, surface runoff, and subsurface drainage to be discharged to the Sanitation District as authorized through a Special Purpose Discharge Permit or written authorization from the Sanitation District; only when no alternate method of disposal is reasonably available or to mitigate an environmental risk or health hazard.

The Dry Weather Urban Runoff and Special Purpose Discharge permit programs are intended to assist in the protection of public health and the environment by routing contaminated discharges into the Sanitation District's treatment and reclamation plants. For example, the toxic amounts of selenium in the Upper Newport Bay Watershed have resulted in regulatory requirements to remove selenium loadings from upstream creeks and channels to protect downstream aquatic life. For dry weather urban runoff discharges, the Sanitation District is able to accommodate certain waste streams that mitigate these hazards. However, the Sanitation District treatment and reclamation plants also have limitations on the loading of pollutants that can be discharged to them — particularly because traditional sewage treatment plants are not designed to remove toxic pollutants, but are designed to remove the conventional pollutants typically found in wastewater generated from normal sanitary uses. The Sanitation District's Ordinance dictates that permitted users, such as Dry Weather Urban Runoff or Special Purpose Discharge users, must comply with numeric effluent limit standards for toxic pollutants. Continuing the example from above, discharges must meet a selenium effluent limit of 3.9 milligrams per liter (mg/L), a derived value based on the compliance standard, the Sanitation District is held accountable in order to reuse biosolids. In this example, the Sanitation District may choose to issue a permit to mitigate a public health or environmental concern, but must do so in such a way as to also address the potential impact on the Sanitation District's plants and its reuse initiatives — with permit numeric limits and conditions.

Current Situation

As of June 2019, the Sanitation District maintains 21 active Dry Weather Urban Runoff Permits for diversions owned and operated by the City of Huntington Beach, the City of Newport Beach, OC Public Works, Irvine Ranch Water District, and a LLC responsible for the areas in and around Pelican Point community. For the June to December 2018 reporting period, the Sanitation District received an average of 1.03 MGD from these facilities, well below the current ten MGD policy cap and nine MGD action threshold. Since the program's inception in 2000, the Dry Weather Urban Runoff Program has treated 9.4 billion gallons of dry weather urban runoff. The success of this program is captured succinctly in reviewing the Heal the Bay 2018-2019 Beach Report Card. Heal the Bay is an environmental non-profit organization focused on coastal water and watershed quality, and reported that 92 percent of beaches in Orange County received an 'A' rating during summer dry weather conditions — some the Sanitation District -service area beaches made the report card 'honor roll' with an A+ rating. It should be noted that this overall rating is negatively impacted by south Orange County beaches that are not in the Sanitation District's service area.

Both the permitted Dry Weather Urban Runoff users and the Sanitation District staff collect samples from Dry Weather Urban Runoff facilities (during dry season discharge) on a semi-annual basis to evaluate compliance with pollutant limits establish in the Sanitation District's Ordinance.

Periodically, the Sanitation District works with other organizations and industries that have intentionally or unintentionally captured stormwater or runoff on-site and seek guidance on disposing of the water. The Sanitation District may authorize such a discharge request where: there is adequate capacity, wastewater meets applicable effluent discharge standards, there is no practical alternative method of disposal, and the wastewater is captured and held until it can be released to the sewer apart from a high-capacity or storm event. The Sanitation District can utilize written authorizations, special conditions on an existing wastewater discharge permit, or a Special Purpose Discharge Permit — issued for planned short-or-long-term discharges. In other instances, the Sanitation District has observed unauthorized stormwater connections to the sewer during routine inspections of facilities and worked with the dischargers to mitigate these to prevent potential overflow conditions.

Special discharges described above, where acceptable through a Special Purpose Discharge Permit or written authorization, are not included in the ten MGD allowance under the Dry Weather Urban Runoff program.

Key Issues for the Future

Under the current policy, the Sanitation District has the capacity to accept additional dry weather urban runoff flows (up to ten MGD), however, this allotted capacity is not typically the limiting factor in increasing the volume of runoff diverted to the Sanitation District. As Dry Weather Urban Runoff diversion projects are initiated and funded at the local municipality level, capital support for such projects can be limited. Without funding and operational support from a public agency that has jurisdiction and authority over surface water runoff and wastewater, this water cannot be diverted.

Diversion systems must be pumped (not gravity-fed) into the Sanitation District's collection system to ensure the necessary level of control. Furthermore, diversions cannot be implemented just anywhere. In order for the Sanitation District to accept this dry weather runoff water, the supporting sewer hydraulic capacity and infrastructure must already be in place at the specific location where the gravity diversion exists. Otherwise constructing new Sanitation District facilities to convey diverted waters would require a significant capital investment from the Sanitation District and its rate-payers. In short, acceptance of dry weather runoff must be evaluated based on the site-specific capacity of the Sanitation District's collection system, i.e. the hydraulic capacity of a specific interceptor/sewer trunkline. In addition, where the intention is to also recycle this runoff water as well as divert it from the Sanitation District's coastal beaches and waters, it must be routed to the Sanitation District's Plant No. 1 facility in Fountain Valley where it can discharge to OCWD's Groundwater Replenishment System (GWRS). At present, the Sanitation District's Plant No. 2 facility does not discharge wastewater to GWRS for recycling, and the majority of existing dry weather urban runoff facilities discharge to Plant No. 2.

The Sanitation District is working to divert the majority of Plant No. 2 influent wastewater to GWRS, however, the expected completion date of this project is not until 2023. It should be noted that the recycling capacity of GWRS is not unlimited and the plan to divert wastewater from Plant No. 2 is expected to provide the near maximum level of influent to GWRS. Therefore, the Sanitation District is not in a position to accept additional wastewater for recycling, and the notion that stormwater is necessary to augment GWRS influent is not a valid assumption.

Given the above conditions, to expand the current programs to a larger-scale stormwater/rain-event capture and discharge program, means an investment for stormwater-authority agencies to build water storage systems in addition to existing or new diversion systems.

The regional benefit for such an initiative would be the increased capture and recycling of water that would otherwise be discharged to the ocean. The potential risk to the Sanitation District and its reuse initiatives from pollutants in stormwater and runoff would be directly impacted by our agency's future ability to control these wastes — that is permit, inspect, and monitor discharging facilities, and when warranted — enact enforcement to ensure compliance with the Sanitation District's Wastewater Discharge Regulations Ordinance. To protect the Sanitation District, this means issuing stringent requirements on discharges or suspending a discharge when an existing or potential sewer user does not meet a compliance obligation. Moreover, the Sanitation District will only be able to accept stormwater and runoff discharges that can be captured and held beyond storm events, and where that water can be adequately evaluated before being released for discharge into the Sanitation District's system.

The financial impact for the Sanitation District would translate to capital and operational costs where the Sanitation District is involved in the construction and maintenance of facilities to support these diversion systems. In addition, a larger-scale stormwater/rain-event capture and discharge program most certainly will require an investment in additional Sanitation District staff in the workgroup that oversees the current permitting programs.

The larger question, beyond the scope of this white paper, is to evaluate at a regional level whether stormwater capture from a rain event will provide an additional source of water significant enough to offset the costs to capture this water and temporarily store it until it can be reused, including the associated infrastructure, staff, and other public resources this would require; and considering the intrinsic restrictions of the current sewer system, GWRS limitations, and the potential risks posed to the Sanitation District's existing water and biosolid reuse initiatives.

Initiatives to Support Progress Toward the Policy Goal

In accordance with Resolution No. 13-09, the Sanitation District intends to continue accepting up to ten million gallons per day of pumped dry weather urban runoff diversion where existing conveyance capacity exists, and the constituents of the flow will not adversely impact the Sanitation District. The Sanitation District also intends to continue working with industries, agencies, and other facilities to offer alternatives to stormwater and runoff disposal through special purpose discharge permits or other written authorization in accordance with the Sanitation District's Ordinance, where doing so does not negatively affect the Sanitation District's operation or compliance with local, state, and federal regulations, and wastewater can be held for evaluation prior to discharge.

Additionally, to act as a regional partner in resolving issues associated with disposing of and reusing stormwater, the Sanitation District intends to work with local jurisdictions to determine the feasibility of regional wet weather runoff capture, storage, and use projects.

- Issue dry weather urban runoff connection permits up to a total of ten million gallons per day to other service area local agencies to accept pumped dry weather urban runoff flows where existing conveyance capacity exists, and the constituents of the flow will not adversely impact the Sanitation District.

- Continue working with industries, facilities, agencies, and local jurisdictions that have authority over stormwater or surface water runoff to determine the feasibility of regional wet weather runoff capture, storage, and use projects or offer alternatives to stormwater and runoff disposal through permits or other written authorization. The Sanitation District will promote responsible stormwater utilization and sewer protection, where doing so does not negatively affect the Sanitation District's operation or compliance with local, state, and federal regulations, and wastewater can be held for evaluation prior to discharge.

Wastewater Management

Chemical Sustainability Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) has a need to use chemicals in its treatment process to improve plant performance, reduce odor and corrosion potential, and meet its regulatory requirements. These commodity chemicals are provided by outside vendors through the purchasing process. Some of these chemicals are subject to price swings due to market condition changes such as energy cost impacts, raw material cost changes, commercial competition changes, and transportation cost volitility. The Sanitation District will identify chemicals key to its operation, investigate the market risks for those chemicals and devise strategies to mitigate identified risks to availability and pricing.

Background

The Orange County Sanitation District (Sanitation District) treatment plants and collection system use several bulk chemicals. A sustainable supply of these chemicals is critical to maintaining an acceptable level of treatment and for ensuring compliance with all regulatory requirements. The Sanitation District spends about $13 million annually on the procurement of eight key chemicals which generally can be broken down into four categories: coagulants, odor/corrosion control, disinfection, and boiler water treatment. Boiler water treatment chemicals are low volume and readily available and will not be considered here.

Coagulant Chemicals

Coagulant chemicals include ferric chloride, anionic polymer, and cationic polymer. These chemicals are the workhorses of the sewage treatment process. Coagulant chemicals work to clump together organic material so it can more readily be separated from water. Ferric chloride is the first chemical added in the treatment process. It is a powerful settling agent that causes organics to clump together and settle to the bottom of primary basins. It is a double-duty chemical in that it also controls the formation of hydrogen sulfide gas, which is a major odorant, by binding to suspended sulphur compounds and causing them to settle before they can be converted by natural bacterial processes to hydrogen sulfide.

Ferric chloride is an iron salt that is produced by reacting iron with hydrochloric acid. It is generally a byproduct of steel treatment, a leftover pickling agent. Ferric chloride is commonly used in the water and wastewater industries. Historically, this chemical has been the subject of a limited supplier base in Southern California. The Sanitation District has been actively splitting supply contracts to multiple vendors to ensure multiple vendors are available. On-site generation of the chemical is impractical due to the hazardous nature of the manufacturing process and acid handling, the bulk steel handing logistics, and waste products disposal.

Anionic polymer works with ferric chloride to further aid in the coagulation or settling of organic compounds in the primary treatment process. These long-chain molecules are designed to be negatively charged to attract or collect positively charged ferric chloride induced organic clumps or flocculant. The use of ferric chloride and anionic polymer is called Chemically Enhanced Primary Treatment or CEPT. The Sanitation District has been using CEPT for more than thirty years.

Anionic polymers are specially designed chains with many potential variants and multiple vendors. Part of the purchasing process for polymers involves polymer trials to document the efficacy of different products from different vendors to get the best cost-performance balance.

Cationic polymer is generally used to thicken sludge or biosolids in centrifuges or dissolved air floatation thickeners (DAFT). These long-chained, positively charged molecules are essential to the proper operation of centrifuges and DAFT units. Part of the purchasing process for these polymers also involves polymer trials to document the efficacy of different products from different vendors to get the best cost-performance balance. It is important to note that it is entirely possible that four different cationic polymers will be used to optimize the performance of Plant No. 1 dewatering centrifuges, Plant No. 1 thickening centrifuges, Plant No. 2 dewater centrifuges, and Plant No. 2 DAFTs, because the performance can vary greatly depending on the equipment or process. Each process will have its own polymer trial to determine the cost-performance balance for each application.

Odor Control Chemicals

The Sanitation District uses several chemicals in the collection system and the treatment plant to reduce the odors normally attributed to sewage and sewage treatment. These chemicals can either prevent the formation of odor causing compound, called odorants, or they can destroy odorants that already exist. Chemicals that prevent the formation of odorants include ferrous chloride, calcium nitrate, magnesium hydroxide, and caustic.

Chemicals used in the collection systems tend to be more benign than chemicals used in the treatment plants due to their proximity to the public. Ferrous chloride is closely related to Ferric chloride as described above. It is a powerful settling agent that prevents the formation of hydrogen sulfide by tying up and settling sulfide compounds in the collection system. It is a preferred chemical because of its dual role, but it isn't as benign as other choices.

Calcium nitrate is another choice for collection system odor control. It works in a different way. Calcium nitrate alters the biological equilibrium in sewage. Generally, bacteria that live by respirating oxygen are the most robust organisms, followed by nitrogen respirating bacteria, and finally sulfur respirating bacteria. Adding calcium nitrate to sewage creates an environment where sulfur loving bacteria don't thrive or create hydrogen sulfide.

Magnesium hydroxide is a third choice for collection system odor control. It works primarily by raising the pH of sewage to a point that is not conducive for odor causing bacteria to thrive. Magnesium hydroxide is the most benign of the chemical choices as it is the main ingredient in Milk of Magnesia.

All three of these chemicals are continuously fed into sewer systems at different points to consistently control the formation of odorants in the system. Where the Sanitation District doesn't have the ability to site a chemical dosing station and persistent odors are being experienced, there is the option to utilize caustic slug dosing. Caustic slug dosing involves using tanker trucks to discharge up to 6,000 gallons of sodium hydroxide into a sewer manhole structure. The very high pH has the effect of killing the bio-slime layer on sewer pipes that creates hydrogen sulfide. This treatment has an instant benefit that reduces hydrogen sulfide production for days to weeks depending on system conditions.

The final major odor fighting chemical is bleach. Bleach is used in treatment plant chemical scrubbers to oxidize odorants in air scrubber units. Bleach is an effective neutralizer of hydrogen sulfide, methyl mercaptan, methyl disulfide, dimethyl disulfide, and many others.

Disinfection

The Sanitation District successfully discontinued disinfection of its effluent to the long outfall. This means that thousands of gallons of bleach and sodium bisulfate are no longer required to be purchased or discharged to the ocean. However, in the event of a discharge to the short outfall or river overflow, disinfection by bleach will be required. Significant on-site storage of bleach and dechlorination chemical, sodium bisulfite, is necessary for this emergency contingency.

Bleach does have a shelf life of about six months. The Sanitation District rotates its disinfection supply to its odor control and plant water treatment systems to prevent product waste.

Process Specific Chemicals

The Sanitation District uses pure oxygen to support its activated sludge secondary treatment process for Plant No. 2. The Sanitation District previously self-generated pure oxygen using a cryogenic oxygen plant rated at 70 tons per day. This plant was removed because it was inefficient at the current average utilization of 35 tons per day and was at the end of its useful life. The Sanitation District contracts for delivery of liquid oxygen and uses a vaporization system to deliver pure gaseous oxygen to the activated sludge process.

Chemical Supply — Purchase vs. Make

The Sanitation District has relied on purchasing bulk commodity chemicals for its treatment plants and collection system. This has proven to be an effective strategy for operational flexibility and to allow concentration on core business. Operationally, the types and volume of chemicals change over time. Over time the types of polymers that are most efficient change. There is a need for more or less volume of chemicals based on sewage flow, sewage quantity, and flow splits between plants. Managing the generation of specialized chemicals using hazardous materials imposes a significant training burden on staff, increases the regulatory oversight and requirements, and increases overall risk to the organization.

The Sanitation District has maintained a policy to split the volume of orders between two vendors to assure competition exists in the marketplace for ferric chloride. While the Sanitation District generally cooperates with other public agencies to pool purchasing power to secure the lowest possible cost through high volume purchasing, some specialty chemicals like ferric chloride require split orders to maintain competitive market forces.

Current Situation

The Sanitation District is constantly changing and improving its facilities to meet new challenges. Each of the facility changes offer new opportunities to reconsider how the Sanitation District operates its processes and how chemicals are used. The best chemical stability outcome is to cost-effectively eliminate the use of the chemical. This is the strategy behind cessation of bleach disinfection of the outfall effluent.

Staff are in the process of studying the potential to operate the treatment plants differently to minimize or eliminate use of selected chemicals. Facilities like centrifuge sludge thickening provide new opportunities to adjust ferric chloride and anionic polymer usage. Opportunities for substitute chemicals will be explored to understand overall cost and efficiency savings potential. This includes iron vs. aluminum coagulant studies, anionic polymer trials, and cationic polymer trials. Staff will also reevaluate operating parameters such as in-basin sludge co-thickening, primary basin sludge blanket level parameters, as well as the greater loading of the secondary treatment systems.

When optimized chemical types and dosages are confirmed, staff will review the market conditions for each important chemical. This will serve as the basis for a procurement strategy for each chemical.

Future Policy Statement

The Sanitation District will thoroughly understand its treatment processes, the potential modes of operation, and the benefit and cost of chemicals to improve or stabilize its process. The Sanitation District will create a list of necessary chemicals for optimal treatment operations which will consider chemical cost, chemical availability, treatment stability, energy utilization, energy creation, nuisance odor control, biosolids generation/cost, and regulatory permit compliance risks.

Chemicals that are deemed most beneficial will be procured at the lowest overall cost from market providers to the extent possible. Where there are market stability concerns, the purchasing division will devise procurement strategies to mitigate procurement risks. Where procurement risk cannot be satisfactorily mitigated, technical staff will evaluate alternatives such as alternate operating methods, substitute chemical usage, or on-site generation of a chemical if feasible.

Initiatives to Support Progress Toward the Policy Goal

- Reduce reliance on any particular chemical or vendor and establish flexibility to utilize other chemicals/processes to accomplish the same operational objectives.
- Update the Sanitation District's Chemical Sustainability Study and incorporate the results in future procurement recommendations.

Biosolids Management Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) will remain committed to a sustainable biosolids program and will beneficially reuse biosolids in accordance with Resolution No. OCSD 13-03 and the 2017 Biosolids Master Plan.

Background

Wastewater solids at both our treatment plants are separated, thickened, digested, and dewatered before being recycled offsite by contractors for composting and land application. Biogas created from the digesters is used to generate electricity to offset the need to purchase power from a local utility. The Sanitation District currently receives sewage sludge from the Irvine Ranch Water District at Plant No. 1, which is scheduled to cease by 2021 when Irvine Ranch Water District completes their own solids treatment facility.

Prior to 2019, the Sanitation District produced an average of 800 wet tons per day (~20% solids) of Class B biosolids dewatered by belt press units. Presently, with the construction and commissioning of co-thickening sludge and dewatering centrifuges, the Sanitation District has been producing approximately 500-600 wet tons per day (25%-29% solids) with biosolids hauling cost savings of approximately $200,000-400,000/month due to the reduction in volume.

The Sanitation District's biosolids program is shaped by federal, state, and local regulations and by the Sanitation District's biosolids policy (Board Resolution 13-03), our biosolids management system, and the 2017 Biosolids Master Plan (Plan). The Sanitation District manages a high quality biosolids program built on a solid policy that emphasizes the diversification of product markets for Class A and B biosolids utilized as a soil amendment for agriculture and horticulture uses. The policy also sets direction to seek opportunities in emerging markets such as biosolids-to-energy technologies to produce renewable energy in the form of biogas or used as a heating value source.

These marketing principles are aligned and supported by the Plan, which provides the Sanitation District a roadmap and framework for reliable and sustainable biosolids management options while minimizing cost. In addition, the Plan sets future capital facilities improvements over a 20-year planning horizon. The Sanitation District will be implementing the Plan to develop a capital improvement project for Plant No. 2 that will result in a major change to the Sanitation District's biosolids program; namely, the construction of new mesophilic and thermophilic digesters that will generate Class A biosolids beginning in 2030. These new digesters are needed for operational resiliency against seismic events. Plant No. 1 will continue to produce Class B biosolids.

The Plan evaluated end-use management alternatives for the Sanitation District's biosolids. This work supports the Sanitation District's biosolids policy and has taken into account the regulatory initiatives imposed on organic management in California as explained below. The Plan established a roadmap for the Sanitation District's commitment to beneficial use of its biosolids. The biosolids management portfolio for the Sanitation District is expected to remain similar to the overall current biosolids management end use options as it is today. Currently about half of the annual biosolids production is going to composting (CA and AZ) and half going to Class B land application in Arizona.

The significant shift will begin when the Sanitation District starts reliably generating Class A biosolids at Plant No. 2. Although this is more than 10 years away, the Plan has identified early planning efforts on future end uses which include:

- Emerging markets: This end use refers to either markets in which biosolids have not been tested in California at this time (e.g. land reclamation) or emerging-technology solutions (e.g. biosolids gasification, supercritical oxidation, fluidized bed combustion, cement kiln drying, pyrolysis etc.).
- Soil blending: This option involves working or partnering with local soil blenders to deliver and blend Class A biosolids with soil to produce a soil amendment.

- Arizona land application: Land application in Arizona will continue to be a part of the Sanitation District's overall biosolids program and serves as a large-capacity outlet for biosolids management.
- California land application: While Class A compost and granules are currently land-applied in California, land application of Class A cake is still restricted in most counties. However, it is anticipated that the implementation of California's organics diversion mandates will loosen local land applications restrictions.

This programmatic framework described above has led to a reliable and sustainable biosolids management program that is designed for the beneficial use of the Sanitation District's biosolids through the utilization of diverse biosolids management options using multiple biosolids contractors, markets, and merchant facilities, while maintaining a failsafe backup capacity of at least 100 percent of the Sanitation District's daily biosolids tonnage. This forethought is necessary due to the flux of regulatory, environmental, market, and financial factors that poses potential risks to the biosolids management in California.

Current Situation

The legislative and regulatory landscapes in California are changing regarding organic management. For the past 15 years, direct land application of Class B biosolids has been predominately prohibited due to strict local ordinances and conditional use requirements, which preempts state recycling laws. However, in recent years there has been a need for organics diversion from landfills, healthy soils, renewable energy, and reduction of Green House Gases (GHGs), which are reflected in several important bills (laws) and initiatives that have been adopted:

- AB 1826 (2014) - Mandatory Organics Recycling for Businesses.
- SB 1383 (2016) - 50% organics diversion from landfill by 2020 and 75% by 2025, which includes biosolids and mandatory organics procurement (compost and biogas) for impacted jurisdiction.
- SB 32 (2016) - 40% Reduction GHG below 1990 levels by 2030
- SB 100 (2018) - 50% renewable resources (i.e. anaerobic co-digestion of food waste) target by December 31, 2026, and to achieve a 60% target by December 31, 2030
- Increasing soil carbon and carbon sequestration under the Healthy Soils Initiative and Forest Carbon Plan.

These measures are expanding "organic waste markets," thereby stimulating interest in siting more composting facilities and organic waste-to-energy projects and encouraging soil blending and direct land application of biosolids, opening opportunities for wastewater treatment plants such as the Sanitation District to locally manage more biosolids. Regulatory agencies such as the State Water Resource Control Board, CalRecycle, California Department of Food and Agriculture, California Air Resources Board, and California Energy Commission are developing regulations to implement the new laws. During the rule making process, the Sanitation District has been actively involved through the California Association of Sanitation Agencies (CASA) and the Southern California Alliance of POTWs (SCAP), advocating regulators to open more biosolids management options in California. In particular, the proposed regulations for SB 1383 will require jurisdictions such as cities and counties to procure recycled organics such as compost and biogas for beneficial use. This organic market will provide opportunities for regional public and/or private partnerships for biosolids management options.

Although there is growing interest in California for organics management, there has also been a rising concern from the regulatory community regarding emerging contaminants such as polyfluoroalkyl substances (PFAS) and microplastics that may have some potential impact to the wastewater sector. Although to date there are no regulatory limits of these contaminants in biosolids or wastewater in California, the Sanitation District has been actively monitoring the development of the science and regulation concerning these emerging concerns.

Future Policy Statement

As the regulatory landscape shapes to stimulate organic waste markets in California, the Sanitation District seeks to leverage its memberships with various industry associations to advocate local, state, and federal agencies to assure biosolids proposed regulations encourage the beneficial use of biosolids as a soil amendment, renewable energy, and a healthy end-use market. The Sanitation District also leverages its memberships to monitor the development of initiatives related to constituents of emerging concern that may impact the beneficial use of biosolids. The Sanitation District's leadership role in these organizations enables us to have a greater influence in key regional, state, and national issues.

The Sanitation District seeks to stay abreast of developments in organic waste markets as they develop in California. The Sanitation District seeks both public and private partnerships with regional biosolids management opportunities including new innovative technology options that convert biosolids to energy and other biosolids recycling operations. This is consistent with the Sanitation District's biosolids policy and plan. To accomplish this, the Sanitation District will issue a request for information (RFI) to research and evaluate available emerging market such as biosolids-to-energy options or other biosolids recycling operations within a 200-mile radius of the Sanitation District to potentially develop a scope of work and minimum requirements for a future contract solicitation.

Consistent with the Sanitation District's Plan, staff will seek to collaborate with OC Waste and Recycling (OCWR) for regional biosolids management opportunities as well as partnering with OCWR to find local solutions to meet SB 1383's organics diversion mandates, including in-county biosolids utilization, composting, food waste co-digestion, and biogas production.

Initiatives to Support Progress Toward the Policy Goal

- Educate and advocate with the local, state, and federal agencies to assure biosolids will continue to be safely and legally used as a soil amendment and monitor and research constituents of emerging concern such as PFAS and microplastics that may impact biosolids.
- Stay abreast of new technology options to convert organics to energy and other regional biosolids recycling and renewable energy partnerships within Southern California.
- Proceed with implementation of new mesophilic and thermophilic biosolids facilities at Plant No. 2 to enhance biosolids quality and marketability while improving the Sanitation District's operational resiliency against seismic events.

Constituents of Emerging Concern Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) will partner with other agencies, associations, and institutions to support the use of sound science to inform policy and regulatory decisions on constituents of emerging concern (CECs) at the federal, state, and regional levels. Staff will obtain and maintain current knowledge on CECs under regulatory consideration, including occurrence, analytical methods, regulations, and treatment to support the Sanitation District's mission.

Background

CECs also referred to as Constituents or Contaminants of Emerging Concern are pollutants that may or may not be subject to regulatory requirements or statutes yet pose a risk to public health and/or the environment. The Sanitation District is a recipient of CECs that are discharged along with domestic and residential wastewater; discharges from industrial, commercial, and other governmental facilities; and tributary discharging jurisdictions. The concept of CECs evolves over time and often the Sanitation District and other entities must acknowledge and understand their impacts to address the effects posed by each CEC.

For more than 50 years, the Sanitation District has adopted and enforced standards and requirements to protect the public health and safety, the environment, and the Sanitation District's workers and facilities, while collecting and treating wastewater. Initially the primary concern to the Sanitation District was conventional pollutants, those that originate from normal sanitary use and can be addressed by conventional wastewater treatment. With the 1972 amendment to the Clean Water Act, and as required by the Code of Federal Regulations, the Sanitation District implemented a mandated pretreatment program to control discharges containing toxic pollutants at their sources through permitting, enforcement, inspection, and sampling. The Sanitation District's Pretreatment Program promulgates the Sanitation District's Wastewater Discharge Regulations Ordinance (Wastewater Ordinance), which governs discharges to the sewer through various types of permits. The Wastewater Ordinance also includes numeric limits, referred to as Local Limits, that control the quality of non-domestic discharges to the sewer. These Local Limits are the result of a technical evaluation and comprehensive sampling and analysis effort, required under the Sanitation District's permit issued by the state to discharge to the ocean — the National Pollutant Discharge Elimination System (NPDES) Permit.

The Sanitation District's current NPDES Permit requires evaluation and monitoring of CECs. The Regional Water Quality Control Board (RWQCB) and EPA required the Sanitation District to study and report on certain newer CECs in the Sanitation District's effluent and the receiving waters. The CEC study had to include the following categories and specified a set of particular constituents in each category: Hormones (8), Industrial Endocrine Disrupting Compounds (7), Pharmaceuticals and Personal Care Products (13), and Flame Retardants (9). Since 2014, California's State Water Resource Control Board has been updating its Recycled Water Policy and has identified CECs under consideration for projects that conduct surface spreading of recycled water, including the Groundwater Replenishment System (GWRS). In addition, to meet the Sanitation District's obligations to provide a high level of service for biosolids reuse and water reclamation through GWRS, the Sanitation District must evaluate and monitor CECs that affect these initiatives.

Although the Sanitation District has been involved with water reclamation with the Orange County Water District (OCWD) since the mid-1970's, the Sanitation District's mission changed significantly in the years leading up to 2008 when the Groundwater Replenishment System (GWRS) was commissioned. GWRS compelled the Sanitation District to consider impacts to drinking water limits and Notification and Response Levels, which are typically much lower than the standards in place for a wastewater treatment plant. For several critical constituents, OCWD and the Sanitation District established a Level of Service commitments. The Sanitation District and OCWD established a response plan to follow when a constituent becomes a concern to either agency. Where the source can be identified, the plan organizes responsive actions from the Sanitation District and OCWD for industrial and commercial facilities. Domestic and residential sources are typically addressed by way of educational outreach to the public.

To determine the constituents that impact the Sanitation District's operations and reuse initiatives, the Sanitation District interacts with federal, state, and local agencies and monitors their regulatory and legislative efforts. Sometimes the job is straightforward, because the federal, state, or local agency focuses on a specific CEC chemical which yields a concentrated effort; however, sometimes, the effort can be interpretative. This requires a comprehensive, well-established program and experienced subject matter experts to identify the CECs that impact the Sanitation District. The Sanitation District must then evaluate the sources and decide what methods will be employed to control the discharges, if necessary.

Current Situation

With newer equipment and techniques, federal, state, and local government agencies are detecting constituents at very low concentrations in the drinking water. This has resulted in agencies studying more constituents and requesting NPDES Permit holders, such as the Sanitation District, to monitor and report CECs detected in the influent and effluent. However, wastewater is a much more complex matrix than drinking water, so reproducible low-level analytical methods are much more difficult to develop and implement for wastewater than drinking water.

The Sanitation District will also be required to develop new methods for addressing some of the CECs primarily discharged from residential communities or are present in the existing drinking water supply. The Sanitation District typically attempts to address such discharges through education and outreach while working with other agencies. Some CECs require the Sanitation District and other agencies to sponsor legislation and regulation development or to comment on a particular subject to protect the agency's interests. For example, the Sanitation District has advocated for minimizing or eliminating the use of specific CECs in manufacturing or consumer use to the California Department of Toxic Substances Control. To achieve its mission, the Sanitation District will need to continue supporting a variety of regulatory and legislative efforts.

Future Policy Statement

If source control, education and outreach, or legislative and regulatory efforts are not successful, the Sanitation District may be required to implement a technological or operational process change/ investment to address a CEC.

The Sanitation District must align its resources to continue managing CECs throughout the service area and treatment process in order to comply with the Sanitation District's existing regulatory requirements and sustain beneficial reuse of biosolids. The Sanitation District shall acquire and maintain a high level of subject matter expertise and engagement across the wastewater, water, water reuse, air quality, ocean monitoring, and biosolids sectors to monitor the threats posed by upstream sources to its system; to continue to work with other agencies and professional organizations to develop robust analytical methods; and to evaluate routinely the need to establish sound policies, local limits, or other regulations and standards based on new local, state, and federal regulations to protect public health and the environment. The Sanitation District is required to continue implementing its established response plan by promoting effective source control and treatment, while also preparing for newer CECs and regulatory obligations. The Sanitation District will continue to work to understand the operational and financial impacts of current and future CECs by monitoring developing regulations and legislation and actively engaging regulatory, environmental, academic, industry, and community stakeholders.

Two families of chemicals, PFAS and PFOA, have been identified as CEC's with a probability of impacting water and biosolids reuse. Attached is OCWD's August 2019 PFOA and PFAS Fact Sheet. This is an example of a CEC where the Sanitation District must be engaged helping to explore the science and shape future legislation and regulation to help create practical solutions to real world concerns.

Initiatives to Support Progress Toward the Policy Goal

- The Sanitation District will continue to actively engage water and wastewater stakeholders to stay abreast of the scientific progress and any potential operational and financial impacts of CECs and provide timely briefings to the Sanitation District's Management Team and Board to facilitate informed decision making.
- The Sanitation District will continue to develop capacity to detect, quantify, and characterize CECs throughout the service area and treatment process in order to promote treatment effectiveness and the communication of credible risks.
- The Sanitation District will proactively research laboratory techniques and other scientific research to understand the real and potential impact of CECs, like PFAS and PFOA, on the reuse of water and biosolids. The Sanitation District will use science-based knowledge to help shape legislation and regulation to protect the public health and environment.

Workplace Environment

Resilient Staffing Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) will attract and retain high-quality talent to support its mission and continue to be an industry leader. It will safeguard leadership continuity and support effective performance of the organization by proactively monitoring the changing work environment and requirements to ensure development programs are relevant and build a skilled bench of readily available successors for key leadership and mission-critical positions.

Background

At the Sanitation District, employees are the organization's most valuable resource. With over 600 dedicated employees whose collective efforts make OCSD an industry leader, the Sanitation District continues to receive national awards and recognition. That is why, OCSD has committed to invest in its employees, resulting in a highly skilled and educated workforce carrying out the mission of protecting public health and the environment.

The Sanitation District has a diverse workforce and a wide range of expertise with approximately 70 percent of positions requiring a degree, certification, and/or license. Occupations on-site include scientists, engineers, environmental and regulatory specialists, operators, mechanics, construction inspectors, as well as professionals in public affairs, finance, IT, safety and human resources.

To cultivate a committed and engaged workforce in a competitive economy, OCSD must promote initiatives to attract and retain talent and prepare staff for successful careers. Strategic succession management initiatives have been developed and adopted that support the design and implementation of comprehensive workforce planning and development tools accompanied by activities that facilitate the improvement of workforce capability, adaptability, efficiency, and accountability. Strategic workforce planning empowers management to project the loss of knowledge and experience caused by retirement and attrition and utilizes a variety of methods to ensure that the Sanitation District has adequate access to talent internally and externally through the recruitment and selection process.

The Sanitation District has a competitive recruitment process that ensures we hire the best person for the job based on qualifications and merit. Human Resources utilizes an objective multi-hurdle approach to hiring which includes Human Resources review and recommendation, subject matter expert application screening, assessment centers, panel interviews (both for technical skills and fit), skills testing, background checks, and reference checks.

Programs that have proven effective in attracting, retaining and developing highly skilled staff for key positions, include:

- Vocational/Professional Student Internship Programs

  Students from the Water Utility Science Program at Santiago Canyon College, and Los Angeles Trade Technical College work 28 hours a week and rotate through five technical trades for 53 weeks in our Operations and Maintenance Department. We started the program in 2010 with four positions and have grown to offer ten positions for each fiscal year. Furthermore, 14 of the program participants have been hired full-time since the program inception. The Sanitation District is piloting the program with other technical colleges in Southern California, to include Cypress College. OCSD offers student and vocational internships, as well as job shadowing and externships.

  The Sanitation District's Professional Student Internship Program offers students an opportunity to work at the professional ranks while attending college full-time for a two-year maximum duration. OCSD partners with Cal State Fullerton, Long Beach, Cal Poly Pomona and UC Irvine, among others.

- Employee Development Program

  In addition to legally mandated training, the Sanitation District provides training and development opportunities for the purpose of increasing job knowledge and to maximize skill sets in employees' current positions and to prepare them for future mission-critical positions. Comprehensive training programs include technical training through industry-specific associations or groups, local schools, and professionals as well as informal on the job training. Employees are encouraged to obtain job-related training necessary to keep OCSD current with recent industry best practices and developments in their respective fields of expertise and can receive Development Pay in select categories that the Sanitation District deems mission-critical. As 70 percent of OCSD's positions require a degree, certificate and/or license, the Sanitation District also promotes professional development through its tuition and certification reimbursement programs for courses completed toward obtaining an associate's, bachelor's or master's degree at accredited colleges, universities, or other institutions or industry specific certifications that are applicable to the industry.

- Workforce Vulnerability Assessments

  Each year, the Sanitation District management conducts an evaluation of their respective departments and identifies key and vulnerable positions based on three criteria: criticality, retention, and difficulty to fill. Vulnerability assessments provide a broader view into the areas of the agency that could potentially be facing a high risk in turnover and are essential to operations. Management is tasked with identifying positions based on the criteria above, then making recommendations on the level of action that is required, complete with proposed action plans. Human Resources staff works closely with management to facilitate workforce vulnerability assessments to develop current and future staffing plans. It is essential that the Sanitation District continues to focus its efforts on prioritizing staffing needs.

- Talent Readiness Assessments

  The process includes departmental leadership evaluating staff and identifying key employee talent, as well as possible development efforts. Feeder positions are identified, and talent pools are developed between employees and management that align with agency goals and builds the talent pipeline.

- Building Leaders and Skills for Tomorrow (BLAST) Program

  In 2011, the Sanitation District began a comprehensive leadership development program to supplement the technical training courses, and includes job shadowing, mentoring, web-based and instructor-led training on soft skills and leadership development. The goal of this development program is to ensure OCSD is building leaders at all levels. Development opportunities are offered to address the potential loss of talent and feed into the Succession Management and Employee Development programs, primarily focusing on soft skills training. The leadership development components include a public sector leadership academy with Cal State Fullerton, and a supervisory training program through Brandman University.

  The Sanitation District partnered with University of California, Irvine, California State University, Long Beach, and California Polytechnic University at Pomona, which provided students an opportunity to job shadow Human Resources and Engineering staff to gain insight into the profession, employment in the public sector and the wastewater industry. The Sanitation District employees also serve on Advisory Councils that weigh in on course curriculum at various schools, both at the high school and college level, across Southern California.

  Throughout the agency, we have several employees who are active members of various professional associations, serve on a Board, or volunteer in various capacities within the industry. The Sanitation District staff is regularly asked to present and teach others about resource recovery. Recruiters attend job fairs, and work closely with universities, professional organizations, and serve on advisory committees.

Education and workforce investment programs represent the most important preparation we can accomplish today to safeguard the agency's future for tomorrow. Finding an adequate pool of applicants and retaining qualified workers is increasingly difficult, which we anticipate will continue on into the future. Retirements are disrupting employment within our industry and changes in technology have made work more complex.

Current Situation

Academics studying the labor force attribute labor shortages to workforce demographics. Depending on the source data, the timelines defining the start/end time of these groups may vary but generally — Baby Boomers are those born between 46-64, followed by Gen Xers 65-81, and lastly Millennials from 82-00. Close to half of staff or 49 percent fall into the "Gen Xers" category, followed by 32 percent made up of "Baby Boomers" and "Millennials" make up 19 percent of our employee population. The Sanitation District is currently facing a potential loss of close to half of its workforce — about 45 percent of employees, primarily from the Baby Boomers group, and some Gen Xers. This represents a potential loss of about 271 people to retirement alone and does not account for other forms of turnover. Hence the need to be proactive and strategic in OCSD's approach to maintain its staffing levels and ensure continuity of operations.

Currently, the majority of OCSD's executives are eligible for retirement. Managers, our next level of leadership, closely follow with 45 percent of them eligible to retire now, and that number increases to 90 percent in five years. The Sanitation District has a little more stability in the trades and professional occupations with retirement eligibility at 53 percent in the next five years. OCSD has a lot of long-term employees with vast knowledge in their respective areas of expertise. Some employees have been a part of the OCSD family for over 35 years; and at last count, ten years was the average years of service. Looking at OCSD's total attrition over the last five years, we have lost 3,025 years of knowledge and experience by 132 individuals leaving the agency since 2014.

In 2010, the Sanitation District proactively implemented a second retirement benefit formula ("classic open plan") ahead of the Public Employee Pension Reform Act, which offered candidates moving from other public sector agencies to OCSD with a retirement benefit of 2.43 percent at 65, with zero employer paid member contribution. Based on the Sanitation District's classic open retirement plan, OCSD is unable to compete for experienced talent from surrounding municipalities, who offer a retirement benefit of 2.5 percent or 2.7 percent at 55 and pay a portion of the employees' contribution. Since implementation of the classic open plan in 2010, only 22 percent of new hires come from other public sector agencies. The Sanitation District has had experience with public sector candidates withdrawing from the process or declining job offers once they learn of the impact to the retirement benefit formula. The vast majority of new hires are coming from private sector and have no public sector experience requiring additional training. Given the legal restrictions which bind the Sanitation District to the classic open formula, it is critical OCSD focus its efforts on retaining current staff, attracting qualified candidates, and investing heavily into developing and growing employees' knowledge, skills and abilities for the future, to address any potential talent shortages.

Future Policy Statement

Human Resources will continue to implement strategic initiatives that ensure workforce capabilities match the work required to meet the Sanitation District's mission and levels of service. Staff is dedicated to proactively monitoring the changing work environment and requirements to implement programs now that address future vulnerabilities. Assessments of changes in business needs, workforce composition, and legal requirements are necessary to ensure resilient staffing.

Initiatives to Support Progress Toward the Policy Goal

- Maintain and enhance current effective development programs that are in place to provide the direction to identify, develop and select the next generation of prepared, capable and engaged leaders, which include:

- Vocational/Professional Student Internship Programs

- Employee Development Program
- Workforce Vulnerability Assessments
- Talent Readiness Assessments
- Building Leaders and Skills for Tomorrow (BLAST) Program
- Strengthening Operator Training Programs
- Continue cyclical Classification & Compensation studies to ensure job classifications accurately depict the work being performed, to set compensation levels accordingly, and stay abreast of market benefit and salary data.

Prior to the next scheduled Classification & Compensation study, Human Resources will work with the Board of Directors and meet and confer with the unions to review selected survey agencies based on recognized classification and compensation standards and the job market in which we compete.

Safety and Physical Security Policy

Summary Policy Statement

The Orange County Sanitation District (Sanitation District) will ensure the safety and security of employees, contractors and visitors through standard practices, policies, and procedures that support a safe and secure environment, provide an appropriate level of security and safeguard OCSD's property and physical assets.

Background

In California, employers must furnish employees with a place of employment free from recognized hazards that cause death or serious physical harm, that is compliant with all legal requirements and aligns with industry best practices. The safety and wellness of the public and employees is our number one priority. OCSD is committed to identifying all hazards through inspection and providing engineering controls, job specific safety training, and personal protective equipment.

Programs that have proved effective in ensuring the safety and wellness of OCSD's workforce, visitors and contractors include:

Safety Assessments and Engineering Controls

In 2014, OCSD conducted a Facility-Wide Safety Assessment Project (SP-145-1) to identify process equipment design and configuration issues that may impact worker safety, and compliance with regulations. The main purpose of this effort was to enhance worker safety and ensure compliance with safety codes. At the same time, safety improvements allow for reliable and efficient operation, so that our facilities can meet regulatory and process demands, while providing cost effective operation. All the Project SP-145-1 recommendations to be implemented by OCSD have either been addressed by Maintenance or have been incorporated into the Safety Improvement Project (J-126).

Emergency Management

The Sanitation District must be prepared to control risks to the organization, and routinely recognize, evaluate, and prepare for emergencies. An emergency can include a major explosion, fire, verified bomb threat, civil disorder, active shooter situation, or uncontrolled materials release which interrupts OCSD's ability to provide safe and environmentally responsible wastewater treatment. The Sanitations District's protocol to control and respond to emergencies is contained within the Integrated Emergency Response Plan (IERP).

The IERP identifies and assesses hazards regarding emergency events which OCSD may be confronted with and contains policies, plans, and procedures for preparing and responding to emergencies. The Sanitation District's emergency response organization, called the Incident Command System (ICS), is activated when an emergency condition cannot be effectively responded to under routine operations. Once the immediate emergency has been controlled, then OCSD must resume normal operations. In the event of a prolonged emergency state, the return to normal operations is guided by a Continuity of Operations Plan (COOP). In May 2018, a COOP was completed with all divisions contributing to its development. Business continuity planning is an ongoing process for OCSD with plans being updated as information changes.

The Sanitation District collaborates with local agencies to ensure available resources are identified and engaged in the event of an emergency. OCSD has partnered with local agencies in the areas of emergency response for evacuation drills and resource sharing.

- The Sanitation District participated in the 2019 Orange Crush Regional Emergency Preparedness and Training Exercise in January 2019. This county-wide exercise used a scenario of a magnitude 7.8 earthquake strike along the San Andreas Fault. A full Emergency Operations Center activation occurred for this functional exercise and gave the Sanitation District the opportunity to test the Integrated Emergency Response Plan.
- The Orange County Sheriff's Department and the Orange County Health Care Agency established a Joint Information Center at Plant No. 2 on May 13-14, 2019 to host an enforcement event in Talbert Park. In addition, the operation was overseen by three federal judges who were present to ensure the rights of all citizens were not violated by law enforcement or The Health Care Agency. Officials utilized Plant No. 2 contractor gates for points of entry.
- The Sanitation District is a member and funding agency of the Water Emergency Response of Orange County (WEROC), which is an organization that is administered by the Municipal Water District of Orange County (MWDOC). It supports and manages countywide emergency preparedness, planning, response and recovery efforts among Orange County water and wastewater utilities.

Security

The Department of Homeland Security has designated 16 critical infrastructure sectors, which includes water and wastewater systems. Wastewater systems are vulnerable to a variety of attacks, including acts of terrorism, contamination with deadly agents; physical attacks, such as the release of toxic gaseous chemicals, and cyberattacks. In addition, the Department of Homeland Security indicates that the average time it takes for a critical incident to take place is up to 12 minutes while the average police response time can be up to 11 minutes and that time could increase should there be a natural disaster.

Additional security concerns include physical violence, vandalism, theft, and trespassers. With approximately 100 acres at each site, 600 employees, contractors, and members of the public on site for tours and meetings, it is essential to maintain a security force that can respond to security threats promptly.

The Sanitation District contracts with a security firm that supplies four armed and five unarmed guards to provide round the clock security monitoring of over 80 cameras, monitoring gate access, and patrolling the perimeter at both plants.

Current Situation

The Risk Management division has been given the responsibility and an adequate budget to assess and control the safety, security, and health risks that employees, contractors, and guests may be exposed to from OCSD operations. Assessment and control of risks is achieved collaboratively between Risk Management staff and internal stakeholders. Risk Management, managers, and staff collaborate to develop written procedures (e.g., policies) that are used for controlling and eliminating hazards at OCSD; thus, ensuring compliance with occupational health and safety standards and laws.

Safety

As the health and safety of employees, contractors and visitors is the number one priority, the Sanitation District strives to achieve safety excellence. This is exemplified by our pursuit of the California Voluntary Protection Program (Cal/VPP). The Cal/VPP is a program created by Cal/OSHA to recognize organizations who have implemented safety and health programs that effectively prevent and control occupational hazards. A Cal/VPP workplace is expected to continually improve its safety program; which means a safe workplace for all. A reduction in injuries and illness has been documented at sites that have committed to the VPP approach. Cal/VPP is recognized as a higher level of protection for the workplace, for this reason, OCSD is pursuing this designation.

In preparation for application to the Cal/VPP program, the Sanitation District conducted a Cal/VPP readiness assessment in January 2019 and developed an implementation strategy. The assessment

included interviews with various OCSD subject matter experts and discussions with employees during facility tours. OCSD procedures and records were reviewed, and limited visual inspection of work locations and facilities was conducted. The assessment considered basic Cal/OSHA regulatory compliance and additional best management practices that are expected to be implemented in VPP certified workplaces. Based on the results of the VPP assessment, OCSD is working toward applying for VPP before the end of calendar year 2019. The timing coincides with the implementation of most of the Safety Improvement Project (J-126), which are critical for success in our VPP pursuit.

This Safety Improvement Project (J-126) is progressing on-schedule. Of the eleven J-126 projects, two have been completed, seven are in the construction phase, and two are pending contractor award. It is important to note that interim measures have been taken to ensure worker safety at the locations identified for safety improvements. Workers are not exposed to hazards while projects are completed.

Eliminating hazards through engineering projects is critical, along with a positive safety culture. In order to assess the safety culture at OCSD, a survey was conducted from February to April 2019. The results of this survey indicated employees believe the safety culture is improving, desired an increase in communication on safety issues, and wanted less online and more hands-on customized safety training.

Emergency Management

The Sanitation District partners with local agencies to ensure available resources are identified and engaged in the event of an emergency. Collaborations currently scheduled include:

- In conjunction with WEROC, OCSD participated in the development of the Orange County Water and Wastewater Hazard Mitigation Plan (Plan) which will be submitted for approval to the State. The Plan provides a framework for participating water and wastewater utilities to plan for natural and man-made hazards in Orange County. The Sanitation District is an active participant in the Plan, and developed a hazard mitigation plan, which is Annex C of the Plan. The resources and information within the Plan will allow OCSD, and participating jurisdictions to identify and prioritize future mitigation projects, meet the requirements of federal assistance programs and grant applications, and encourage coordination and collaboration in meeting mitigation goals.
- On July 27, 2019, the Sanitation District partnered with the Fountain Valley Police Department Explorers during OCSD's Open House event. The Police Explorers assisted Human Resources and Risk Management with crowd and traffic control. Their assistance was beneficial in the management of public during this important event.

Security

The designation of wastewater systems as critical infrastructure by the Department of Homeland Security requires OCSD to be diligent in protecting people and property from security breaches. OCSD seeks to continually improve the security program. On June 7, 2019, OCSD issued a Request for Proposal (RFP) for Security Services, which included a potential expansion of security services for OCSD's new Headquarters Complex. As part of the RFP evaluation, OCSD will review procedural and technical enhancements/innovations that may improve the existing program.

In addition, OCSD has established a Security Committee, which includes stakeholders from a cross-section of the organization, to collect input and assess physical and cybersecurity concerns and suggestions. Responsibilities of the committee include, but are not limited to, development of a physical and cybersecurity plan, reviewing orders and policies, reviewing incident reports, and planning drills. The first meeting of the committee was held on June 6, 2019.

Future Policy Statement

Risk Management has and will continue to implement strategic initiatives that will ensure the safety, health, and security of its workforce, and proactively plan for emergencies to ensure continuity of operations. Staff is dedicated to proactively monitoring the changing work environment and

requirements to implement programs now that address future vulnerabilities. Assessments of changes in business needs, plant processes and legal requirements are necessary to ensure a safe and secure work environment. The results of improvement will be measured using leading metric indicators and reported to the workforce to foster employee engagement.

Initiatives to Support Progress Toward the Policy Goal

Safety

- Complete outstanding safety projects, improvements, and corrective actions to apply and obtain Cal/OSHA Voluntary Protection Program (VPP) status; and continue to foster a culture where employees are accountable for their safety as well as the safety of others.

Emergency Management

- Support facility and countywide emergency preparedness, response, and recovery efforts by partnering with entities, such as, the Water Emergency Response Organization of Orange County (WEROC), Orange County Sherriff Department, and local fire departments to plan and continue to conduct disaster preparedness training and exercises.

Security

- Continually identify and assess vulnerabilities and implement solutions through the Security Committee and third-party assessments. Prevent/mitigate security breaches using physical security systems such as video monitoring, access control, and armed security patrols.

Reclamation Plant No. 1 (Administration Offices)
10844 Ellis Avenue • Fountain Valley, California 92708

Treatment Plant No. 2
22212 Brookhurst Street • Huntington Beach, California 92646

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11/2019

ORANGE COUNTY SANITATION DISTRICT
COMMON ACRONYMS

ACWA	Association of California Water Agencies	**LOS**	Level Of Service	**RFP**	Request For Proposal
APWA	American Public Works Association	**MGD**	Million Gallons Per Day	**RWQCB**	Regional Water Quality Control Board
AQMD	Air Quality Management District	**MOU**	Memorandum of Understanding	**SARFPA**	Santa Ana River Flood Protection Agency
ASCE	American Society of Civil Engineers	**NACWA**	National Association of Clean Water Agencies	**SARI**	Santa Ana River Interceptor
BOD	Biochemical Oxygen Demand	**NEPA**	National Environmental Policy Act	**SARWQCB**	Santa Ana Regional Water Quality Control Board
CARB	California Air Resources Board	**NGOs**	Non-Governmental Organizations	**SAWPA**	Santa Ana Watershed Project Authority
CASA	California Association of Sanitation Agencies	**NPDES**	National Pollutant Discharge Elimination System	**SCADA**	Supervisory Control And Data Acquisition
CCTV	Closed Circuit Television	**NWRI**	National Water Research Institute	**SCAP**	Southern California Alliance of Publicly Owned Treatment Works
CEQA	California Environmental Quality Act	**O & M**	Operations & Maintenance	**SCAQMD**	South Coast Air Quality Management District
CIP	Capital Improvement Program	**OCCOG**	Orange County Council of Governments	**SOCWA**	South Orange County Wastewater Authority
CRWQCB	California Regional Water Quality Control Board	**OCHCA**	Orange County Health Care Agency	**SRF**	Clean Water State Revolving Fund
CWA	Clean Water Act	**OCSD**	Orange County Sanitation District	**SSMP**	Sewer System Management Plan
CWEA	California Water Environment Association	**OCWD**	Orange County Water District	**SSO**	Sanitary Sewer Overflow
EIR	Environmental Impact Report	**OOBS**	Ocean Outfall Booster Station	**SWRCB**	State Water Resources Control Board
EMT	Executive Management Team	**OSHA**	Occupational Safety and Health Administration	**TDS**	Total Dissolved Solids
EPA	US Environmental Protection Agency	**PCSA**	Professional Consultant/Construction Services Agreement	**TMDL**	Total Maximum Daily Load
FOG	Fats, Oils, and Grease	**PDSA**	Professional Design Services Agreement	**TSS**	Total Suspended Solids
gpd	gallons per day	**PFAS**	Per- and Polyfluoroalkyl Substances	**WDR**	Waste Discharge Requirements
GWRS	Groundwater Replenishment System	**PFOA**	Perfluorooctanoic Acid	**WEF**	Water Environment Federation
ICS	Incident Command System	**PFOS**	Perfluorooctanesulfonic Acid	**WERF**	Water Environment & Reuse Foundation
IERP	Integrated Emergency Response Plan	**POTW**	Publicly Owned Treatment Works	**WIFIA**	Water Infrastructure Finance and Innovation Act
JPA	Joint Powers Authority	**ppm**	parts per million	**WIIN**	Water Infrastructure Improvements for the Nation Act
LAFCO	Local Agency Formation Commission	**PSA**	Professional Services Agreement	**WRDA**	Water Resources Development Act

ORANGE COUNTY SANITATION DISTRICT
GLOSSARY OF TERMS

ACTIVATED SLUDGE PROCESS – A secondary biological wastewater treatment process where bacteria reproduce at a high rate with the introduction of excess air or oxygen and consume dissolved nutrients in the wastewater.

BENTHOS – The community of organisms, such as sea stars, worms, and shrimp, which live on, in, or near the seabed, also known as the benthic zone.

BIOCHEMICAL OXYGEN DEMAND (BOD) – The amount of oxygen used when organic matter undergoes decomposition by microorganisms. Testing for BOD is done to assess the amount of organic matter in water.

BIOGAS – A gas that is produced by the action of anaerobic bacteria on organic waste matter in a digester tank that can be used as a fuel.

BIOSOLIDS – Biosolids are nutrient rich organic and highly treated solid materials produced by the wastewater treatment process. This high-quality product can be recycled as a soil amendment on farmland or further processed as an earth-like product for commercial and home gardens to improve and maintain fertile soil and stimulate plant growth.

CAPITAL IMPROVEMENT PROGRAM (CIP) – Projects for repair, rehabilitation, and replacement of assets. Also includes treatment improvements, additional capacity, and projects for the support facilities.

COLIFORM BACTERIA – A group of bacteria found in the intestines of humans and other animals, but also occasionally found elsewhere, used as indicators of sewage pollution. E. coli are the most common bacteria in wastewater.

COLLECTIONS SYSTEM – In wastewater, it is the system of typically underground pipes that receive and convey sanitary wastewater or storm water.

CERTIFICATE OF PARTICIPATION (COP) – A type of financing where an investor purchases a share of the lease revenues of a program rather than the bond being secured by those revenues.

CONTAMINANTS OF POTENTIAL CONCERN (CPC) – Pharmaceuticals, hormones, and other organic wastewater contaminants.

DILUTION TO THRESHOLD (D/T) – The dilution at which the majority of people detect the odor becomes the D/T for that air sample.

GREENHOUSE GASES (GHG) – In the order of relative abundance water vapor, carbon dioxide, methane, nitrous oxide, and ozone gases that are considered the cause of global warming (“greenhouse effect”).

GROUNDWATER REPLENISHMENT SYSTEM (GWRS) – A joint water reclamation project that proactively responds to Southern California’s current and future water needs. This joint project between the Orange County Water District and OCSD provides 70 million gallons per day of drinking quality water to replenish the local groundwater supply.

LEVEL OF SERVICE (LOS) – Goals to support environmental and public expectations for performance.

N-NITROSODIMETHYLAMINE (NDMA) – A N-nitrosamine suspected cancer-causing agent. It has been found in the GWRS process and is eliminated using hydrogen peroxide with extra ultra-violet treatment.

NATIONAL BIOSOLIDS PARTNERSHIP (NBP) – An alliance of the NACWA and WEF, with advisory support from the EPA. NBP is committed to developing and advancing environmentally sound and sustainable biosolids management practices that go beyond regulatory compliance and promote public participation to enhance the credibility of local agency biosolids programs and improved communications that lead to public acceptance.

PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) – A large group (over 6,000) of human-made compounds that are resistant to heat, water, and oil and used for a variety of applications including firefighting foam, stain and water-resistant clothing, cosmetics, and food packaging. Two PFAS compounds, perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) have been the focus of increasing regulatory scrutiny in drinking water and may result in adverse health effects including developmental effects to fetuses during pregnancy, cancer, liver damage, immunosuppression, thyroid effects, and other effects.

PERFLUOROOCTANOIC ACID (PFOA) – An ingredient for several industrial applications including carpeting, upholstery, apparel, floor wax, textiles, sealants, food packaging, and cookware (Teflon).

PERFLUOROOCTANESULFONIC ACID (PFOS) – A key ingredient in Scotchgard, a fabric protector made by 3M, and used in numerous stain repellents.

PLUME – A visible or measurable concentration of discharge from a stationary source or fixed facility.

PUBLICLY OWNED TREATMENT WORKS (POTW) – A municipal wastewater treatment plant.

SANTA ANA RIVER INTERCEPTOR (SARI) LINE – A regional brine line designed to convey 30 million gallons per day of non-reclaimable wastewater from the upper Santa Ana River basin to the ocean for disposal, after treatment.

SANITARY SEWER – Separate sewer systems specifically for the carrying of domestic and industrial wastewater.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) – Regional regulatory agency that develops plans and regulations designed to achieve public health standards by reducing emissions from business and industry.

SECONDARY TREATMENT – Biological wastewater treatment, particularly the activated sludge process, where bacteria and other microorganisms consume dissolved nutrients in wastewater.

SLUDGE – Untreated solid material created by the treatment of wastewater.

TOTAL SUSPENDED SOLIDS (TSS) – The amount of solids floating and in suspension in wastewater.

TRICKLING FILTER – A biological secondary treatment process in which bacteria and other microorganisms, growing as slime on the surface of rocks or plastic media, consume nutrients in wastewater as it trickles over them.

URBAN RUNOFF – Water from city streets and domestic properties that carry pollutants into the storm drains, rivers, lakes, and oceans.

WASTEWATER – Any water that enters the sanitary sewer.

WATERSHED – A land area from which water drains to a particular water body. OCSD's service area is in the Santa Ana River Watershed.