



T&E AGENDA: 05/7/2018

ITEM: d (4)

# Memorandum

**TO:** TRANSPORTATION &  
ENVIRONMENT COMMITTEE

**FROM:** Kerrie Romanow

**SUBJECT:** SEE BELOW

**DATE:** April 18, 2018

Approved

Date

26 APRIL 2018

**SUBJECT: DISCHARGE REGULATIONS AND FUTURE IMPACTS ON THE SAN JOSE – SANTA CLARA REGIONAL WASTEWATER FACILITY**

## **RECOMMENDATION**

Accept the annual update on regulatory items related to the San José-Santa Clara Regional Wastewater Facility.

## **OUTCOME**

Provide an update to the Transportation and Environment (T&E) Committee on status of potential regulatory requirements that could impact the San José-Santa Clara Regional Wastewater Facility<sup>1</sup> (RWF).

## **EXECUTIVE SUMMARY**

The RWF is the largest advanced wastewater treatment plant in the western United States, serving a population of 1.4 million people and over 17,000 businesses across eight cities and the County. The RWF is the largest discharger into the San Francisco Bay, a large industrial air emissions source, and is continually faced with meeting increasingly stringent regulatory requirements. The RWF is regulated under two principal operating permits: A National Pollutant Discharge Elimination System (NPDES) permit under the Clean Water Act, administered by San Francisco Bay Regional Water Quality Control Board (Water Board), and an Air Operating Permit under Title V of the Clean Air Act, administered by Bay Area Air Quality Management District (BAAQMD).

<sup>1</sup> The legal facility name remains San Jose-Santa Clara Water Pollution Control Plant, but a new common name, San José-Santa Clara Regional Wastewater Facility, was approved in early 2013.

NPDES permit requirements have become increasingly stringent over the years, but the RWF has been able to successfully meet them through capital improvements and a robust pretreatment/source control program. Since 1997, the RWF has also had a South Bay Monitoring Program (SBMP), which tracks a variety of water quality and habitat data points to demonstrate that the RWF's discharge, or effluent, is not harmful to the South San Francisco Bay (Bay). Data from the SBMP has also helped inform new regulations and facilitated a reduction in the requirements in the most recently issued NPDES permit.

New regulations related to both the air and water permits and to the disposition of biosolids have been adopted or are currently under consideration by our State regulators. For wastewater, staff is specifically focused on developing regulations for Contaminants of Emerging Concern, Toxicity, Nutrient Reduction, and more stringent Environmental Laboratory Standards. New and pending wastewater regulations represent advancements in the identification of and detection of limits for water quality contaminants. Incremental improvements in overall water quality are not typically achieved by incremental investment in treatment technologies, if those even exist, so staff continues to monitor and participate in the formal rulemaking process on behalf of the rate payers in order to advocate for reasonable requirements.

For air emissions, staff is following the rule making for Toxic Air Contaminants, and Greenhouse Gas emissions, including methane, so staff is monitoring for potential impacts on RWF operations and the capital improvement program (CIP). Air emissions are typically directly focused on human health impacts in the vicinity, but more focus on climate-related concerns is a recent trend. Emissions reductions are typically achieved through end-of-pipe and fuel-cleaning control technologies, but like their wastewater counterparts, can come with capital-level design costs. Staff must continually evaluate new rules and proposed permit conditions and look for the most cost-effective engineering and policy solutions.

The State, through new CalRecycle-sponsored regulations, is also creating a new rule that would potentially affect the RWF's ability to dispose of its biosolids at the nearby Newby Island landfill, which could significantly increase disposal costs. As adopted by the passage of SB 1383 (2016), the new rule attempts to address climate pollutants, such as methane, that result from the landfill disposal of organic material. The current definition of organics under this rule includes biosolids, so the RWF could be forced to transition out of its current drying process much sooner than planned.

This report provides a summary of these regulations and discusses how the CIP is being developed to position the RWF to respond to these new and anticipated future regulations.

## **BACKGROUND**

Since 1956, the RWF has been continually treating Silicon Valley's wastewater and protecting public health and the South San Francisco Bay (Bay) environment. The RWF is a critical piece of regional infrastructure that powers the economy and facilitates growth for most of Santa Clara County. Since the 1950's the RWF service area population has more than tripled. Despite



extremely rapid growth, the RWF has been able to treat wastewater to the highest standards and the waters near the RWF discharge continue to have an abundance of marsh plants, fish, and birds.

The RWF is the largest wastewater discharger in San Francisco Bay and the largest advanced wastewater treatment plant in the western United States, serving a population of 1.4 million people (roughly one-fifth of the entire Bay Area population) and over 17,000 businesses across eight cities and the County. From industrial dischargers to residents and restaurants, the RWF is responsible for cleaning wastewater to the highest standards before it is discharged to the shallow waters of the South Bay. The RWF incorporates primary, secondary biological nutrient removal (BNR), filtration, and disinfection into its treatment processes.

The RWF is sized to treat 167 million gallons per day (MGD) average daily dry weather flow. Currently, the year-round and average dry weather influent flow is 100 MGD. Average effluent flow into the Bay through the Artesian Slough averages between 70 to 84 MGD, with an average of approximately 11 MGD diverted to the South Bay Water Recycling system to be used as recycled water in three cities. All solids produced as a byproduct of the treatment process are treated in digesters and sent to open air lagoons and drying beds. The dried solids are sent annually to the adjacent Newby Island Landfill to be used as Alternate Daily Cover (ADC).

The RWF operates a critical regional asset while being a good steward of the environment and enabling recreational uses by and in the Bay. The Don Edwards National Wildlife Refuge is located right near the effluent discharge. Public trails winding along Artesian Slough accommodate day hikers and wildlife photographers. Fishing enthusiasts and seasonal duck hunters launch from the new Alviso Boat Launch to fish and hunt in waters flowing from the RWF.

#### Regulatory Permits

The RWF is regulated under two principal operating permits:

- A NPDES permit under the Clean Water Act administered by the Water Board. The current NPDES Permit was issued in September 2014 and will be up for renewal in September 2019.
- An Air Operating Permit under Title V of the Clean Air Act administered by BAAQMD. The Air Permit was issued in March 2017 and will be up for renewal in March 2022.

The NPDES Permit mandates water quality monitoring requirements for the RWF's effluent discharges to the Bay and sets specific concentration limits for a number of metals and organic compounds. The NPDES Permit further requires that RWF effluent discharge may not cause or contribute to impairment of any beneficial use.

Over the last two decades, the EPA and the Regional Board have been developing water quality regulations related to a variety of pollutants. Regulatory focus through the late-1980s and early 1990s was on copper, nickel, and freshwater flows. In the late 1990s this focus shifted to cyanide, legacy mercury, and Polychlorinated Biphenyls (PCB).

At present, the RWF has specific effluent limits for the following chemical constituents: biochemical oxygen demand, suspended solids, ammonia, oil and grease, copper, nickel, cyanide, dioxin, indeno pyrene, pH, chlorine residual, turbidity, dissolved oxygen, enterococcus bacteria, mercury, and PCBs. The RWF has thus far successfully been able to meet or exceed increasingly stringent regulatory requirements through capital improvements and a robust pre-treatment/source control program.

The Title V program is designed to standardize air quality permits for major sources of emissions across the country and is required for facilities that emit more than the Major Source Thresholds (MSTs) of criteria pollutants. The Title V program is administered by the Air Quality Management District for the region in which the facility operates. The criteria pollutants include carbon monoxide, ozone, lead, nitrogen oxides, particulate matter, and sulfur dioxide. The Title V permit incorporates the facility permit to operate also issued by the BAAQMD and all other applicable local, state, and federal air quality regulations. A new regulation related to toxic air contaminant emissions has been adopted by the BAAQMD that could affect the RWF by 2020.

The RWF tracks emissions from its engine generators through a combination of fuel consumption, source testing, and monitoring of pollutant levels in its digester gas fuel supply. These parameters are reported to the BAAQMD on an annual basis. In addition, the RWF submits a report of Title V compliance status semi-annually.

Several new wastewater and air regulations are currently under consideration or have been adopted. These regulations have the potential to adversely impact operations and the capital improvement program at the RWF.

## **ANALYSIS**

### **Wastewater Regulations**

Wastewater regulations evolve somewhat slowly, over multiple 5-year permit cycles, but can have significant impacts to operational and capital costs that affect rate payers, so RWF staff must proactively engage with their regulators and push for the most cost-effective approaches. In ESD's report to the T&E Committee on April 3, 2017 ([http://sanjose.granicus.com/MetaViewer.php?meta\\_id=625636](http://sanjose.granicus.com/MetaViewer.php?meta_id=625636)), staff highlighted the beneficial impacts of monitoring the South Bay for wastewater-related effects through providing data to regulators to inform the best solutions for the bay and the RWF.

### **Wastewater Regulations under Consideration**

- Reissuance, in 2019, of the San Francisco Bay Nutrient Watershed Permit. Over the past year, regional wastewater agencies have had productive dialogue and negotiations with regulators that have resulted in more certainty about requirements in the next nutrients permit. As reported in the April 2017 T&E memo, regulators were seriously considering capping current nutrient loads (no net loading increases) and not allowing nutrient increases even due to population growth. Through collective negotiation, the RWF and



partner wastewater agencies successfully delayed the no net loading increase plans until at least 2024 and secured early agreement with regulators that the 2019 Nutrient Permit will include increased funding to evaluate nutrient impacts on the Bay, and evaluate possible nutrient reduction strategies.

- Possible tighter regulations for allowable loads of selenium following additional food web modeling of selenium impacts in the South Bay by EPA using more current and relevant data.
- Tighter regulations for allowable loads of contaminants of emerging concern (CECs). Concerns in a January 2018 Report over ecological effects and increased antibiotic resistance due to CECs in wastewater discharges to the environment may increase monitoring costs and result in new limits for CECs in future wastewater discharges. Future indirect potable reuse projects may face increased costs for monitoring and additional treatment based on the Report's recommendations.
- Numeric limits for toxicity testing based on a new proposed State Toxicity Plan. Adoption of numeric toxicity limits is expected in Fall of 2018, with full implementation occurring in summer 2019. Numeric limits could result in recurring NPDES Permit violations if final limits are unreasonably stringent.

### **Air Quality Regulations**

#### Toxic Air Contaminants

Since last year's update to the committee, BAAQMD has adopted a new rule, Regulation 11, Rule 18 (Rule 11-18) that is intended to assess and reduce human health risks associated with toxic air contaminant emissions from facilities throughout the Bay Area. The RWF is among the sources subject to Rule 11-18. The RWF will be required to fund a human Health Risk Assessment (HRA) to be performed by an independent contractor under the guidance of BAAQMD.

BAAQMD will utilize an updated and more conservative methodology for the HRA, so there is a potential for existing RWF sources to need greater levels of emissions control or other mitigation measures. Staff will coordinate with BAAQMD to ensure that the most up to date emissions information is used in the HRA so that the health risks associated with the RWF are not overstated. The HRA for the RWF is not expected to be conducted before 2020.

#### Greenhouse Gas Emissions – Cap and Trade

In the absence of federal action to reduce greenhouse gas (GHG) emissions, California has been moving forward with state level programs including a cap and trade program for GHG. The current program authorized by AB-32 in 2006 was set to expire in 2020. The program will now be extended through 2030 with the adoption of SB-32 in 2017.

The cap and trade program limits overall GHG emissions from large sources such as fossil fuel fired power plants, cement plants, and other large consumers of fossil fuel. Allowances for GHG emissions are purchased through an auction process from the California Air Resources Board (CARB), or on the secondary market through a broker. The RWF has purchased allowances for emissions for the last five years but will no longer need allowances once the RWF's 2017 GHG



emissions are accounted for, due to the consistent management of emissions under the cap for the compliance period ending in 2017.

CARB is drafting a regulation to implement the directives of SB-32. The regulation to continue the cap and trade program is expected to be similar in structure to the existing regulation. However, the overall allowable emissions cap will decrease from approximately 350 Million Metric Tons (MT) of Carbon Dioxide equivalents (CO<sub>2</sub>e) in 2018 to 250 Million MT CO<sub>2</sub>e in 2030. This is expected to cause an increase in the cost of GHG emission allowances and could also result in the RWF needing to purchase allowances in the future.

#### Greenhouse Gas Emissions – BAAQMD Methane Rules

Methane is a relatively potent (21 times as potent as carbon dioxide) GHG that is generated through the anaerobic decomposition of organic matter in processes such as the anaerobic digesters at the RWF. BAAQMD has begun rule development on measures intended to reduce methane emissions at Bay Area facilities. The first of these rules, Rule 13-2 is intended to require facilities to find and eliminate any large (defined as >10 lb/day) methane leaks. The rule is currently under development and is scheduled to be adopted later this year. City staff and BACWA are following the rule development and will provide comments to BAAQMD when the draft rule is posted.

BAAQMD also lists wastewater treatment facilities and anaerobic digesters as targets for industry-specific methane reduction rules. Formal rulemaking for these rules has not been initiated. City staff and BACWA will monitor developments, provide comments, and participate in discussions with BAAQMD during the rule development process.

#### **Other Related Regulations**

##### Implementation of SB 1383 – reduction of organic waste disposal to landfills

Wastewater treatment at the RWF is accomplished by using a series of physical, biological, and chemical processes to treat the liquids stream and the solids stream. Separated solids (or sludge) from wastewater is thickened and processed through anaerobic digesters to reduce pathogen content, sludge volume, and create biogas for beneficial reuse. The digested sludge is then pumped to open air lagoons and drying beds for further sludge volume reduction, treatment, and stabilization over a four-year cycle. This process generates approximately 85 tons of biosolids per day, which must be disposed of or beneficially reused. RWF biosolids are currently trucked once annually to nearby Newby Island Landfill annually and beneficially applied as Alternate Daily Cover (ADC) to cover waste in the landfill.

While not directly connected to any of the RWF permits, the SB 1383 legislation (2016) recently enacted in California has introduced uncertainty for all Publicly Owned Treatment Works, including the RWF, on the long-term viability of disposition of biosolids as ADC at landfills. The overall intent of SB 1383 is to reduce Short-Lived Climate Pollutants, and it sets a goal of diverting 50 percent of 2014 levels of organic waste from landfills by 2020, and mandates diverting 75 percent of 2014 levels of organic waste from landfills by 2025. Biosolids, such as



those produced at the RWF, are included within the definition of organics to be diverted from landfills.

The California Department of Resources Recycling and Recovery (CalRecycle) and California Air Resources Board (CARB) are jointly developing draft regulatory text to enact this legislation and are considering the complete diversion of biosolids from landfills (including ADC) to reduce organic waste to landfills. Once finalized, this legislation could preclude the RWF from continuing to dispose of its biosolids at Newby Island Landfill (or any other California landfill) as soon as January 1, 2022. Even though Newby Island Landfill recently received an extension from the City of San José Planning Commission, there is no guarantee that Newby Island Landfill will continue to accept the RWF's biosolids once the SB 1383 regulation is enacted. Although the RWF is planning to transition out of its current drying process to a mechanized, odor controlled process by 2027, as part of its capital improvement program, the new regulations would not allow adequate time for this transition and could result in an increase in operational costs due to needed interim disposal solutions.

In November 2017, CalRecycle and CARB sought informal input from stakeholders, and the City provided comments to seek a waiver for RWF biosolids from being considered as organic material due to their low moisture and organic content and low potential to generate Short-Lived Climate Pollutants. The intent of seeking this waiver is to allow the RWF sufficient time to come into compliance with the new regulations while a new dewatering facility is being constructed (discussed further in the potential impacts section). Formal regulatory review on SB 1383 is expected to take place throughout 2018, with adoption of regulation in early 2019 and implementation in early 2020.

The RWF and partner agencies, such as California Association of Sanitation Agencies (CASA) and Bay Area Clean Water Agencies (BACWA), are actively providing input to CalRecycle and CARB on this draft regulatory text. The City is also participating in the next CalRecycle informal rulemaking workshops to be held in early May 2018.

#### New Laboratory Quality Assurance Standards

The Environmental Services Department Laboratory (ESD Lab) is accredited by the Environmental Laboratory Accreditation Program (ELAP) administered under the auspices of the State Water Board. ELAP accreditation is necessary to perform the required testing at the RWF to ensure regulatory compliance with the State and wastewater treatment process effectiveness. In 2016, the State Water Board instituted a new and more onerous quality assessment accreditation standard, referred to as The Nelac Institute Standard (TNI), and is currently in the formal rulemaking process with a tentative forecasted approval date of mid-2019. Once approved, a three-year implementation period to meet the TNI is expected.

The ESD Lab has evaluated the proposed TNI requirements and has identified several areas that will likely require significant program enhancements to ensure that the ESD Lab can continue the necessary accreditation and keep the RWF in compliance. These areas include, but are not limited to, increased document control, traceability, and validation of all data; and greater training requirements and associated documentation of staff competencies. For a laboratory with



ESD's complexity, breadth of service (i.e., over 100 EPA-approved analytical methods), and variety of technical staff, the additional workload in the development of a documented Quality Management System will be significant. The current approach is for the ESD Lab to procure the services of a quality systems consultant to assist in the TNI implementation process, timeline development, gap analysis, staff training; and provide technical support to help augment our efforts to develop and implement the new standard.

#### Regulatory-Driven Laboratory Instrumentation and Equipment Upgrades

The ESD Lab provides critical analytical services in support of wastewater operations, compliance monitoring of NPDES and Watershed Permit requirements, recycled water, and pretreatment monitoring at the RWF. As mentioned above, anticipated regulatory changes (e.g., CECs, toxicity) will necessitate instrumentation and equipment upgrades. Much of the Laboratory's analytical equipment and supporting peripheral components have already exceeded the general recommended life expectancy of five to ten years. More stringent or new regulations will require new analytical technologies as well as the development of enhanced or new analytical methods associated with those new technologies, with further implications to the aforementioned TNI Standards. ESD Laboratory is in the process of identifying and prioritizing equipment and peripheral replacements that will meet or exceed current and forecasted regulatory compliance monitoring requirements and data quality objectives.

The underlying challenge for the ESD Lab is the availability, capacity, and experience of laboratory staff to respond to the pending TNI Standards, engage in the equipment replacement process, and to possibly maintain the increasing level of service demands. With nearly half of the current laboratory staff having less than two years of experience, due to continuing staff turnover, the technical process of implementing the aforementioned changes, while maintaining regulatory compliance, laboratory accreditation, and avoiding added contractual lab cost, non-compliance penalties, or loss of accreditation will be challenging.

#### **Potential Impacts of New Regulations on RWF Operations and Capital Improvements**

As stated earlier, although many of the regulations being considered are in a formative stage, they do have the potential of adversely impacting operations and the capital improvement program at the RWF.

#### Nutrient Limits

The RWF has consistently demonstrated its effectiveness in removing nutrients (nitrogen and phosphorus) from wastewater, reliably removing approximately 50% of the nitrogen and 70% of the phosphorus from the waste stream. Although the RWF does not currently have limits for total nitrogen or phosphorus, it is anticipated that the Water Board will develop nutrient limits within the next two 5-year permit cycles. Although the extent and exact timing of future nutrient limits is still unclear, the upcoming issuance of 2019 Nutrient Watershed Permit calls for additional investment from the region's Publicly Owned Treatment Works for more scientific research in the Bay to help inform future nutrient regulations. At the completion of this 5-year research period (2024) it is anticipated that the Water Board will then work to develop nutrient limits and a specific timeline for implementation.



The CIP has a project that is currently underway (Aeration Tanks Rehabilitation) which focuses on the rehabilitation and repair of critical components of the RWF's Biological Nutrient Removal (BNR) process, where nutrient reduction occurs. This project is important for maintaining current operating systems and ensuring reliable treatment of the waste stream. The current ten-year CIP has anticipated a future project (Aeration Basin Future Modifications) that will be focused on addressing potential regulatory changes, specific to limits for total nitrogen. In order to accommodate additional nutrient removal in the BNR system, process modifications will have to be implemented which will require a change in physical infrastructure and modification to RWF operations of the system. The project is considering future regulatory requirements as regional science and nutrient regulations are developed through ongoing Nutrient Watershed Permit negotiations that will define any future treatment performance requirements.

The extent and timing of any recommended capital improvements to meet the more stringent nutrient criteria will be addressed as a second project (Aeration Basin Future Modifications) commencing in 2019 and scheduled for completion in 2030.

#### Constituents of Emerging Concern

Constituents of Emerging Concern, or CECs, is a term used to include a broad range of unregulated chemical components found at trace levels in many of our water supplies. An example of these components includes pharmaceuticals and personal care products, which are increasingly being detected at low levels in surface water, and there is a concern that these compounds may have an impact on aquatic life. The RWF does not currently have any regulatory requirements specific to CECs; however, as previously mentioned there are conversations ongoing pertaining to CECs and tighter regulations are anticipated in the future. Additionally, at the time of development of the Plant Master Plan, it was anticipated that CEC regulations may be in place within 2-3 permit cycles. Consequently, the current ten-year CIP envisioned a project to construct a new Ultra Violet (UV) Disinfection system to address CECs. We will continue to monitor this item over the next few permit cycles.

#### Toxic Air Contaminants

Recently adopted Rule 11-18 could require additional measures to reduce emissions of toxic air contaminants in the future. However, the new Cogeneration Facility currently under construction and scheduled to be commissioned in 2019 mitigates the risk of future emissions reductions, because the project includes emissions controls that comply with the requirements of the new rule. The Cogeneration Facility will also allow the decommissioning of older emissions sources that could have been subject to more stringent requirements.

#### Greenhouse Gas Emissions – Cap and Trade

The new Cogeneration Facility will also be affected by the extension of the cap and trade program. If the Cogeneration Facility is used as anticipated to provide all the heat and power needs for the RWF, GHG emissions will exceed the trigger threshold for the cap and trade program due to the combustion of natural gas. The RWF can avoid the cap and trade program by purchasing gas generated by biogenic sources or by directly utilizing landfill gas from the

Newby Island Landfill. Alternatively, the RWF can purchase GHG emission allowances under the cap and trade program. The costs and benefits of each of these alternatives are currently being evaluated. Use of landfill gas would result in increased initial capital costs while the other options would lead to higher annual operating costs.

#### Greenhouse Gas Emissions – BAAQMD Methane Rules

The RWF will be subject to BAAQMD Rule 13-2 and the upcoming wastewater methane reduction rule. All potential impacts of these rules cannot be determined until the rules have been published. However, Rule 13-2 will include at least additional monitoring requirements. An estimate of the costs of compliance with the rules will be developed when the rules are published.

#### Biosolids/Organics Diversion

As recommended by the Biosolids Transition Strategy, recommended by TPAC in May 2015 and approved by the City Council in June 2015, the RWF is in the process of transitioning the biosolids process from the current open lagoon and drying bed process to a fully-enclosed mechanical dewatering process. Construction of the new digested sludge dewatering facility will position the RWF to have diversified and multiple disposition options for its biosolids. Dewatered cake is a desirable end-product based on previously completed market surveys and will ensure that the RWF has biosolids disposition options in compliance with the pending SB 1383 regulations. The project is estimated to be operational by 2022 and includes developing a phased approach for transitioning out of the current open-air lagoons and drying beds by 2027, and the current landfill disposal operations.

Staff will continue to monitor development of the CalRecycle regulations and timing of their implementation and will be further refining the implementation plan for the biosolids transition including developing a comprehensive contracting strategy and updating the previously identified dispositions options and market analysis in light of SB 1383.

#### **EVALUATION AND FOLLOW UP**

Staff will continue to track regulatory discussions and communicate with regulators and with other Publicly Owned Treatment Works through member agencies through involvement in several regional groups and research efforts including BACWA, CASA, San Francisco Bay Regional Monitoring Program (RMP), San Francisco Estuary Institute (SFEI), and the San Francisco Bay Nutrient Management Strategy Steering Committee. Staff will plan to return to the T&E Committee on an annual basis with an update, and will bring forward recommendations on specific items, as appropriate.



**PUBLIC OUTREACH/INTEREST**

This memorandum will be posted on the City's website for the May 7, 2018 Transportation & Environment Committee agenda.

**COORDINATION**

This report has been coordinated with the City Attorney's Office.

**COMMISSION RECOMMENDATION/INPUT**

This item is scheduled to be heard at the May 17, 2018 Treatment Plant Advisory Committee meeting.

**CEQA**

Not a Project, File No. PP10-0669 (a), Staff Reports.

/s/  
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For questions, please contact Ashwini Kantak, Assistant Director of Environmental Services, at (408) 975-2553.