



**Working to Preserve the Health and Safety of the Greater Richmond
Community and Environment**

Secondary Clarifier Rehabilitation

One of several major treatment plant construction projects completed in 2018



May 30, 2018

**ANNUAL OPERATING REPORT
2018**

**RICHMOND WASTEWATER TREATMENT PLANT -
SANITARY AND STORM WATER COLLECTION SYSTEMS**

RICHMOND, CA WASTEWATER TREATMENT PLANT

**ANNUAL OPERATIONS REPORT
January 1, to December 31, 2018**

Prepared by

Veolia North America

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SAFETY PROGRAM STATUS/REVIEW:

It's a Culture, Not a Campaign



Safety Achievements

- Veolia Richmond has had no lost time safety incidents since October 7, of 2008. There were no OSHA recordable safety incidents in 2018.
- Plant staff conducted all required Veolia Water monthly safety training as well as specialized safety training from outside providers. Additionally, staff held frequent internal departmental safety tailgate meetings.
- Completed all required monthly internal safety inspections and Annual Site Safety Audit
- Plant staff participated in the Great California Shakeout earthquake preparation drill in October. The drill was coordinated by Veolia regional safety management staff with many of the company's West Region sites participating.
- Plant staff supported safety culture and performance during capital construction projects by observing, bringing forward issues and providing feedback to CPM, City staff and the various contractors throughout the projects.

WASTEWATER TREATMENT PLANT PERFORMANCE STATUS/REVIEW

2018 Operational Status and Statistics:

- 2.301 billion gallons of wastewater (6.30 million gallons per day or MGD) was treated through the Richmond WPCP and discharged into San Francisco Bay in 2018. By comparison, the total volume treated in 2017 was 2.658 billion gallons (7.28 MGD). The decrease in discharge in 2018 from 2017 was 357 million gallons or 13%. Very heavy rains in January and February of 2017 and the corresponding high plant flows accounted for the difference in flow volume. During the first three months of 2017 25.56 inches of rain fell (just over the annual average) according to the rain gauge at the Richmond WPCP. Rainfall in 2018 was 26.45 inches and in 2017 32.25 inches; the annual average is about 25 inches

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- **91.8%** of biochemical oxygen demand (BOD) was removed
- **91.8%** of total suspended solids (TSS) were removed

Operational Improvements Implemented and Noteworthy Activities Included:

- The most significant operational upgrades in 2018 were the complete rehabilitation of the treatment plant's # 2 and 3 Secondary Clarifiers and Primary Sedimentation Basins # 1 and 2. Secondary Clarifier # 1 was substantially rehabilitated in 2017 however some finish work was required for that unit in 2018.
- Veolia's CPM (Capital Program Management) group with plant operations support and Central Sierra Electric (prime subcontractor) completed and closed out the full replacement project of the plant's electrical infrastructure in early 2018.

Operational Challenges Included:

- Continuing to operate facility lacking functional grit removal system
- DAFT (dissolved air flotation system) reliability. The DAFT process is used to remove and thicken solids from the secondary system; there is no redundancy for the unit. Its drive assembly suffered a support structure (located near the tank floor) break due to corrosion in 2017; the tank was drained and the component welded back together as a temporary repair. The system was scheduled for replacement during 2018 but the project has been delayed for lack of funding. Ultimately the DAFT system will be replaced with a different technology known as rotary drum thickeners (RDTs). The RTD system will be enclosed with odor control which will be a vast odor improvement over the DAFTs which are designed as open tanks. The DAFT system continues to operate but the concerns remain of a possible process failure.
- Difficulty with the automated dechlorination system (process that removes chlorine from effluent prior to discharge). The SBS (used for dechlorination) storage and feed system originally scheduled for rehabilitation in 2018 and has been designated as a priority project; the project has been delayed due to delays in funding.
- Multiple aeration mixer failures and replacements during the year. The system is due for replacement with alternative aeration technology.
- Veolia O&M staff resources continue to be reallocated from City WPCP O&M to West County Water District O&M of effluent monitoring and chemical feed control system.

COMPLIANCE SUMMARY STATUS / REVIEW:

NPDES

In 2018 there were (11) exceedances of the Richmond WPCP effluent limits.

Between the first and second week of September, conditions in the treatment plant developed such that the amount of solids in the activated sludge process began to drop without a clear understanding

as to why. The condition affected the settling and growth characteristics of the activated sludge to the point where wasting from the system was discontinued on September 13 and for the rest of the year. Plant staff evaluated process changes, installed polymer and chemical feed as remedial measures and, in addition, engaged several consultants, expert in the field of wastewater process operations to assist in the investigation. The City's pretreatment/source control staff worked with business and industry in the service area to determine that if there were any discharges of materials to the sewer system that may be impacting the plant's biological process; it is Veolia's understanding that the City's findings were inconclusive that IPP POTW dischargers did/did not inhibit the WPCP biological process. Extra plant and sewer network analytical monitoring efforts were carried out during the period.

By mid-January of 2019 the Richmond WPCP has returned to normal, compliant process operations. The final report of investigation is being developed with an expected completion and submittal time frame of mid February 2019. During the nearly 4 months the Richmond WPCP processes were adversely impacted, regular communications and updates were provided to the Regional Water Quality Control Board engineer, by phone, e-mail and in the monthly self-monitoring reports. During 2018, two of three of the Richmond WPCP secondary clarifiers were fully rehabilitated (completely new mechanical components and concrete rework) and the third secondary clarifier had the rehabilitation process (begun in 2017) completed. Both primary sedimentation basins also were fully rehabilitated with completely new mechanical components in 2018. These projects resulted in all 5 basins being taken in out of service during different times of the year (some more than once) and the solids transferred between various process units within the plant. Staff has not determined and is not representing that these projects necessarily caused the upset however from an operational standpoint, those were the activities representing major changes from the norm. As a result of the upset, the following effluent limit exceedances occurred;

There were (2) NPDES permit violations during the month of October 2018. The monthly average effluent limits for BOD and TSS were 37 and 32 respectively. Both of those values are above the limit of 30 mg/l.

(4) NPDES permit violations occurred during the month of November 2018. The monthly average effluent limits for BOD and TSS were 44 and 45 mg/l respectively where the limit is 30 mg/l. In addition there was one exceedance each of the weekly average limit for BOD and TSS (45 mg/l). During the week of November 24 effluent BOD was 59 and TSS 58 mg/l.

In December of 2018 there were (5) NPDES permit violations determined. The monthly average effluent limits for BOD and TSS were 39 and 43 mg/l respectively where the limit is 30 mg/l accounted for (2) exceedances. In addition there were (2) weekly average exceedances of TSS (limit of 45 mg/l and values of 50 and 57) and (1) weekly average exceedance of BOD (limit of 45 mg/l and value of 46).

Richmond WPCP 2018 Blending Summary;

Blending events at the Richmond WPCP over the last 7 years are summarized below in Table 1. The average annual rainfall in Richmond is about 25 inches. Generally the higher above average a wet season is in terms of rainfall amount, the higher the frequency and volume of blending. In 2017, extreme concentrated rainfall occurring in January and February contributed to the high duration and volume blended.

The most relevant seasonal comparison of system performance can be observed by comparing the 2018 and 2014 calendar years; the results are promising. Both seasons showed above average precipitation (although 2018 had about 10% less rain). In spite of that relatively small differential, there were 50% fewer blending events, a 59% reduction in duration of blending, and a 61% reduction in volume blended.

As additional data on coming wet seasons is gathered, and future sewer rehabilitation projects and blending reduction measures are completed and implemented, the data are expected to demonstrate further reductions in blending.

Table 1

Year	Number of Blending Events	Total Duration of Blending Events (hours)	Volume of Blended Effluent (MG)	Rainfall ¹ (inches)
2012	11	198.5	110.89	31.03 (24% above normal)
2013	0	0	0	6.47 (about 25% of normal)
2014	6	188.2	92.84	29.49 (18% above normal)
2015	2	9.8	1.57	10.79 (about 43% of normal)
2016	8	151.6	78.45	30.18 (21% above normal)
2017**	9	431.6	194.85	32.25 (29% above normal) **
2018	3	77.47	35.89	26.45 (6% above normal)

¹Normal annual rainfall in Richmond is approximately 25 inches. Rainfall data are taken from the manual rain gauge at the treatment plant. The rainfall numbers have been changed slightly in this table to reflect calendar year total as opposed to the typical wet season (October thru March)/dry season format.

** Just less than 22 inches of rain fell during January and February

2019-2020 Goals and Process Improvement Recommendations

- Begin conversion to Ignition SCADA automation and control platform for plant and lift stations. Firm has been selected for this project which should begin in 2019 and continue for 1.5 to 2 years.
- Upgrade aeration system by converting to fine bubble diffused air or similar system (90% designed; awaiting funding with construction expected to begin late in 2019 or early 2020)
- Replacement/rehabilitation of the SBS (sodium bisulfite; removes chlorine prior to discharge) storage, distribution and feed system. This system provides dechlorination to both the Richmond and West County Wastewater District treatment plants. (on hold pending funding)
- Upgrade grit removal facilities (90% designed; awaiting funding with construction expected to begin in late 2019 or early 2020).
- Rehabilitation of 3 water distribution system (currently on hold)
- Upgrade of plant security camera system (currently on hold)
- Work with West County to replace the outdated and largely non-functional MOSCAD radio communication system that allows for automation and control of the landfill leachate and digested sludge exchange

Odors and H2S Alerts

Table 2.0 below shows the year over number of telephoned odor complaints to the treatment plant and call center from 2014 through 2018. In 2018 there were 26 calls and it is noteworthy that Webster Environmental Associates (Webster) completed an updated Treatment Plant Odor Evaluation late in 2017 into early 2018 (finalized early 2018). Webster has been conducting these odor evaluations about every 5 years since 2007. The 2018 report concluded that the primary clarifier and grit removal systems are the major source of odors from the facility. The report also indicated an increase in odor emissions since the previous study done in 2013. During 2018 both primary clarifiers were completely rehabilitated which allows staff to better control the sludge levels in those process tanks, thus more effectively controlling odors. Staff also installed a chemical feed system (ferric chloride) in the primary system and is evaluating an additional odor control technology. The grit removal system is scheduled to be replaced completely with construction beginning in late 2019 or early 2020. 9 of 26 (35%) of the calls came from individuals driving by the treatment plant on Canal Blvd. On several occasions during 2018 Air District inspection staff visited the treatment plant but in none of those cases were findings made or any type of citation or written notice provided.

Table 2.0 **Richmond, CA WPCP**

Year	Number of Phoned in Odor Complaints
2018	26
2017	22
2016	36*, **
2015	12
2014	12

* 4 calls in March were related to a flaring event at a refinery

** 9 calls in September and 8 of 12 calls in October were associated with activities at the West County Landfill

Table 3.0 shows the total tabulated H2S alerts measured at the treatment plant North, South and Brickyard Cove H2S monitors from 2015 and 2016. In late 2017 the H2S monitoring network installed by the original vendor (Hadronex) was decommissioned and as such the number and frequency of alerts in 2017 is not available. City staff contracted with an alternative vendor (Sonoma Technologies) for their equipment, website and services. Treatment plant north and south fence line H2S monitors were made operational and available to the public in the first quarter of 2018. The major change made with the new H2S monitoring system is that alerts are only sent when the H2S

meets or exceeds 60 ppb at the north or south fence lines. This level is consistent with the Air District Permit to Operate issued for the treatment plant. On May 12, 2018 the system sent false alerts for H2S determined to be due to a programming bug which was immediately corrected by the system vendor. There were no other H2S alerts sent by the system during the year.

Table 3.0

H2S Alerts

	2016			2015		
	North	South	Brickyard	North	South	Brickyard
December	0	0	0**	0**	OOS	OOS
November	1	3	OOS	OOS	OOS	OOS
October	1	0	OOS	OOS	OOS	0
September	2	1	0**	OOS	OOS	0
August	0	0	OOS	OOS	1**	0
July	0	0	0**	OOS	0	0
June	0	0	0	0**	0	0**
May	0	0	0	0**	1	0
April	1	OOS	0	0**	1	0
March	0	0**	OOS	OOS	3	0
February	OOS	0**	OOS	0	3	0
January	0	0	OOS	1	8	0
Total	5	4	0	1	17	0

OOS = meter out of service ** = 50% or less meter uptime for the month

Only H2S alerts above the regulatory response threshold (30 ppb) are included

MAINTENANCE DEPARTMENT STATUS / REVIEW:

A tabulated work order summary for 2018 is provided below based on the preventative and corrective maintenance performed at the facilities by area.

Table 4.0

Work Order Summary

	Preventative Maintenance		Corrective Maintenance		Total	
	2017	2018	2017	2018	2017	2018
Storm Lift Stations	893	967	9	11	902	978
Sanitary Lift Stations	1045	1101	13	24	1058	1125
WWTP	832	979	179	307	1011	1286
Total	2770	3047	201	342	2971	3389

Below in Table 5.0 are major maintenance expenditures made during 2018. The costs do not account for all maintenance expenditures; they are representative of major equipment replacement, maintenance or substantial overhaul. Veolia’s contractual requirement for major

maintenance expenditure is \$60,000 annually. It should be noted that while the amount varies from year to year, smaller maintenance expenses for tools, equipment, lubricants and other supplies in addition to the cost of various service contracts, add from \$90,000 and \$110,000 to the total plant maintenance spend.

Table 5.0 2018 Richmond WPCP Major Maintenance and Projects

Process Area	Project Description	Project Cost (Rounded)
VEOLIA FUNDED TREATMENT PLANT RELATED		
Lift Stations	Upgraded Sunset Sanitary Lift Station with non-clogging Flygt submersible pumps.	\$12,000.00
Boiler System	Annual maintenance service and emissions testing.	\$16,000.00
Digester System	Completed Bi-Annual Digester Dystor Cover inspections.	\$25,000.00
Secondary Process	Replaced all 480V service disconnect switches for plant TWAS, RAS pump applications.	\$18,200.00
Digester System	Replaced the West County sludge transport flow meter system.	\$4,000.00
Lift Stations	Upgraded all pump collection lift stations to smart works cellular modems.	\$15,000.00
Plant Facility	Installed concrete walk-ways leading up to each newly installed electrical sub-station motor control buildings.	\$16,800.00
Digester System	Upgraded the digester ferric chloride injection system with new peristaltic pumping system.	\$4,000.00
Head works	Overhaul influent pump #3 and return to service.	\$20,000.00
Process	Costs for investigating and mitigating process upset (root cause understood likely to be related to plant upgrade construction projects)	\$45,000.00
Total		\$176,000.00
CITY FUNDED		
Fleet	Purchased a new service utility hoist truck to maintain the 23 pump lift stations.	\$115,000.00
Influent – Headworks Area	Replaced the influent wet-well bio-filter media	\$43,500.00
Potable Water System	Completed the plant facility potable water motor control center upgrade & rehab project.	\$36,000.00
Facilities	Decommissioned, removed & recycled both plant facility above ground fuel tanks & pumps.	\$15,000.00

Influent – Headworks Area	Purchased complete set of replacement parts for bar screen	\$105,000.00
Facilities	Replaced plant automatic entry gates.	\$71,000.00
Disinfection	Replaced existing SBS & Hypo analyzers with new ATI auto-chemical analyzers.	\$87,700.00
Odor Control	Chemicals and equipment	\$120,000.00
Total		\$593,200.00
	City Funded	\$473,200.00
	Veolia Funded	\$131,000.00
	Total	\$649,200.00

Table 6.0 2019 Planned Maintenance Projects

The planned projects below are a preliminary and partial list of projects to be completed in 2019 – 2020 by Veolia O&M maintenance. Some will be funded by the City and some through Veolia’s internal maintenance budget. This list is supplemented by a comprehensive budgetary project list provided to City staff during the recent 2019/2020 budget process.

2019 Planned Projects
Complete the 23 rd Street Storm Water Lift Station M & C panel upgrade.
Replacement wet-well safety hatch replacement for 5 Sewer & Storm Pump Lift Stations.
Purchase redundant back-up submersible pumps for Sewer & Sanitary Pump Lift Stations.
Replace existing permanent style pumps with semi-permanent Flygt pumps located at the Enterprise Storm Water Pump Station.
Replace RAS flow monitors.
Replace Plant Wet Weather Bio-Odor bed with new bark and materials.
Replace Confluent Channel De-watering submersible pump.
Bi-annual Digester Dystor Cover Inspections
Annual Boiler Service Maintenance & Emission Testing.
Replace Primary Clarifier progressive cavity scum pumps.
Replace Secondary Process Aeration Blending Mixer
Replace digester recirculation Muffin Monster grinder #201
Refurbish maintenance shop meeting and break-room
Replace Hurst Boiler burners #1 & 2
Relocate both plant air compressors to new location within plant facility
Replace significant sections of PG&E natural gas lines at plant facility
Replace permanent submersible pumps at Enterprise Storm Water Lift Station with semi-permanent Flygt submersible pumps

2019 Maintenance Department Goals & Objectives

- Directly assist with the design, implementation, and construction of all capital projects, physical improvements, and OWAM maintenance programs

- Continue to maintain plant facility & lift station systems and equipment at a high level of reliability
- Manage facility physical assets through infrastructure stabilization – high quality repairs and intensive preventive maintenance to attain high levels of reliability and service availability
- Provide a clean and attractive plant with efficient and effective service
- Maintain safe working conditions and continued implementation of Veolia's required safety programs to obtain zero preventable and recordable accidents in 2019.

VEOLIA CAPITAL PROJECTS MANAGEMENT (CPM):

Achievements in 2018

CPM is the construction arm of Veolia North America responsible primarily for capital projects and providing the construction management function for those projects. Following are the projects and improvements status for 2018:

- Completed construction on the **13th Street & Dunn and 23rd Street Rehabilitation Project** – the project replaces over 34,000 lf of pipe in the City of Richmond; also provides CM consultant inspection for the project. Final completion was achieved in August 2018.
- Completed design engineering work on the **Lift Station Master Plan**. The project prepared a Master Plan for the City of Richmond's sewer collection system lift stations, which are managed and operated by Veolia Water. The Master Plan includes a hydraulic and condition assessment of the existing facilities, and a 10-year capital improvement plan (CIP) that includes recommended capacity and rehabilitation improvements.
- Completed design engineering work on the **WWTP Biosolids to Energy Plan**, which provides engineering services to prepare a Biosolids and Energy Plan for the Richmond Waste Water Treatment Plant; the project was 100% complete in 2018.
- Completed the **WWTP Perimeter Site Evaluation**, which involved a review of existing information, topographic surveys and field data collection, preliminary hydrologic and hydraulic analyses, review regulatory and permitting requirements, and develop improvement alternatives for stormwater flows and flooding that come from the hillside watershed area to the west of the Richmond Water Pollution Control Plant during wet weather; the project was 100% complete in 2018.
- Completed construction on the **WWTP High Priority Project, Secondary Clarifiers** – the project replaced aging infrastructure and improved treatment reliability and operating efficiency, beginning with the secondary Clarifiers; the project was approximately 100% complete in October 2018; also provides CM consultant inspection for the project
- Completed design engineering work on the **Sludge Leachate Line Condition Assessment**, which involves assessing the current condition of the City of Richmond's Sludge Leachate Line, which is old and in need of repair; the project was 100% complete in 2018; a final condition assessment report was provided.
- Completed construction on the FY 17/18 **Manhole Rehabilitation Project** which replaced 76 deteriorated manholes within the City's collection system.

- Began construction of the **Cutting, Carlson, and Hoffman Boulevard Wet Weather Improvements** sewer project; construction is planned to be finalized mid-2019. The project replaces pipelines with NASSCO PACP Structural Grade 4 and 5 defects in the sewer sheds that flow to Cutting Boulevard. As of December 2018, approximately 5,000LF was installed out of the planned 23,000LF.
- Began design engineering work on **Macdonald & Virginia Wet Weather Improvements** sewer project; The project replaces pipelines with NASSCO PACP Structural Grade 4 and 5 defects in the sewer sheds that flow to Cutting Boulevard; the project was approximately 80% complete in 2018.
- Began design and procurement of the **Meeker Ditch Trash Capture Device Project** - this project involves installing two below-ground, flow-through treatment devices that use multiple treatment processes to screen, separate and trap trash, debris, sediment, hydrocarbons and other pollutants from stormwater runoff.
- Began construction on the FY 18/19 **Manhole Rehabilitation Project** which plans to replace approximately 30 deteriorated manholes within the City's collection system.
- Began design engineering work on the **Collection System Risk Model Update** – this project was necessitated per the 2018 Baykeeper Settlement Agreement, Section IX, Collection System Condition Assessment and Risk Assessment Analysis, "By January 15, 2019, and annually thereafter, Richmond shall perform an updated Risk Assessment Analysis on all gravity sewer line segments in Richmond's Collection System rated Grade 4 or 5 via the Pipeline Assessment Certification Program (PACP) process and update the Rehabilitation/Repair schedule based on its results." The project was 90% complete in 2018.
- Began construction on the **City's Year 1 Sewer Rehabilitation Project** point repair/rehabilitation segments that had been identified to be completed under the 2018 Risk Assessment Analysis conducted as part of the Baykeeper Settlement Agreement of 2018; the project was approximately 75% complete in 2018.

LABORATORY STATUS / REVIEW:

Achievements in 2018

- A new laboratory manager was hired October 1 following the previous lab manager's (with 15 year tenure at the Richmond project) retirement
- Laboratory participated successfully in the State Proficiency Testing for Laboratory QA/QC
- All Self-Monitoring Reports and Discharge Monitoring Reports were successfully uploaded into the CIWQS database for electronic submittal to the State and to the Regional Water Quality Control Board
- Laboratory data is managed through the Veolia Corporate standard Hach WIMS program
- Utilizing the on-site and contract laboratories, staff completed all National Pollutant Discharge Elimination System (NPDES) permit required sampling and analyses as well as all nutrient monitoring and reporting requirements
- Laboratory staff provided support to the operations group for daily process control as well as for unscheduled high flow events and odor monitoring

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- Veolia Richmond Project laboratory analyzed **1,535** compliance samples and **6,753** process control samples
- The laboratory maintained its Environmental Laboratory Accreditation Program certification for applicable analyses
- Laboratory staff continued to implement and comply with Veolia's corporate internal quality control/quality assurance program
- Laboratory staff worked with the City's IPP personnel to implement in-house monitoring of CODs to assist in detecting irregularities in the influent composition
- Laboratory staff assisted with improvement of the plant-wide safety program and assisted administration personnel

Goals for 2019

- Advance in development of documentation to comply with new TNI requirements as the state of California moves toward their adoption
- Continue to participate in cross training with other departments and provide assistance as needed
- Evaluate implementation of additional analyses into the laboratory by the end of the year

SANITARY SEWER AND STORM WATER SYSTEM STATUS/REVIEW:

2019 Department Goals and Objectives

2018 marked the 15th year that Veolia Water operated and maintained the City of Richmond's 179-miles of gravity and 4-miles of sanitary sewer collection system, lift stations and storm water assets. The following primary goals continue to guide Veolia's efforts in the operation and management of the City of Richmond's sanitary and storm water collection systems and requires working closely with City staff:

- Minimize the number of non-capacity related sanitary sewer overflows (SSO's) through well-defined and focused O&M efforts
- Focus on continual improvement to customer satisfaction through quick response times, effective and regular face to face interactions, and prompt follow-up
- Protect public and employee health, environmental quality and property from SSOs and related hazards
- Protect the City's sanitary sewer system assets by appropriate and effective maintenance and repair and replacement activities

- Implement Sewer System Management Plan for sanitary collection system O&M
- Maintain well developed, effective and well defined cleaning/CCTV plans and schedules for sanitary and storm systems based on asset needs and equitable resource allocation
- Continue to implement quality assurance processes to validate sewer cleaning methods
- Encourage and to incentivize staff to increase their CWEA certification levels and other job skills

Sanitary System

Tables 7.0 and 8.0 below indicate the number and volume of overflows from the engineered overflow structures (weirs) at Harbor and Wright and Boat Ramp between 2017 and 2018.

Table 7.0 SSO from Engineered Overflow Structure

2018 Harbor and Wright Overflow			
Date of Spill	Gallons spilled	Start time	End time
	0		
2017 Harbor and Wright Overflow			
Date of Spill	Gallons spilled	Start time	End time
	0		

Table 8.0

2018 Boat Ramp Overflow			
Date of Spill	Gallons spilled	Start time	End time
2/7/2018	625,710	00:00	13:00
2017 Boat Ramp Overflow			
Date of Spill	Gallons spilled	Start time	End time
1/11/2017	36,250		

Table 9.0 below shows SSO occurrences in 2017 and 2018. The Baykeeper Settlement of

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2018 set SSO reduction goals and included a target SSO limit of (20) SSO's per 100-miles of system, or (37) total SSO/s, for the 2018 calendar year.

A total of (13) SSOs were reported to CIWQS in 2018; (0) were capacity-related (i.e. SSOs resulting from unusually high wet-weather), (12) were O&M related, and (1) was due to pipe failure. From a CIWQS SSO Category standpoint, SSOs in 2018 were as follows:

- Category 1 (reached surface water and/or storm water collection system)
 - = (4)
- Category 2 (> 1000-gallons that did not reach surface water and/or storm water collection system)
 - = (0)
- Category 3 (all other discharges)
 - = (6)

Wet weather/capacity related SSOs occur in areas of the system that have insufficient capacity to convey sewage when infiltration from extended or heavy rains increases the flow within the sewer pipes. Additionally, the high flows tend to mobilize solids (grease, rags, sediment etc.) in the sanitary sewers and those materials are redeposited in other areas when the flows subside. This action sometimes results in a higher frequency of SSOs following rainy periods (independent of capacity).

During dry weather, infrastructure issues (pipe failure due to age or pipe settling creates offsets in joints) or blockages (caused by grease build-up, rags, intruding lateral connections or tree roots, for example) predominate as the primary cause of SSOs.

Table 8.0

		Sanitary Sewer Overflow Statistics				
	Q1 (January – March)	Q2 (April – June)	Q3 (July - Sep)	Q4 – (October – December)		
2018	4	2	2	5	13	
2017	35	3	8	11	58	
Reduction/Increase	-88.6%	-33.3%	-75%	-54.5%	-53.4%	
2018 Baykeeper Target	9.25	9.25	9.25	9.25	37	
2017 Baykeeper Target	2.5	2.5	2.5	2.5	10	
2018 SSO Percentage	30.8	15.4	15.4	38.4	100	
2017 SSO Percentage	60.3	5.2	15.5	19	100	
2018 SSO Type	Number	Total Volume	% Volume to Surface Water			
Capacity – Wet Weather	9	1,962	79.7			
SSOs - Other Causes	4	12,975	93.1			

Volume Reaching Surface Waters from Non Capacity/Wet Weather Causes	1564
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Volumes Presented in Gallons

Wet Season = Q1 and Q4

Dry Season = Q2 and Q3

Program Metrics and Achievements

- Lead and supervisory members of the collections O&M staff maintained their PACP (Pipeline Assessment & Certification Program) certifications.
- Monthly and Annual performance metrics are as noted below:

Month	Customer Calls	System Footage Cleaned	System Footage CCTV'd	Manhole Inspections	System Pipe Segment Cleaning QA/QC	Point Repairs	Manhole Repairs*
January	23	39,988	8,975	0	0	2	0
February	14	50,493	14,457	31	6	1	0
March	28	52,529	8,653	15	6	6	0
April	16	75,575	21,510	11	8	3	0
May	14	55,629	22,169	19	9	1	0
June	22	48,393	11,624	6	11	1	0
July	14	44,728	13,226	6	8	1	0
August	13	41,154	-	0	9	0	0
September	14	57,861	16,588	8	0	0	0
October	7	109,723	45,254	42	0	0	0
November	10	59,923	35,072	23	0	0	0
December	9	26,667	5,522	0	0	0	0
Totals =	184	662,663	203,050	161	57	15	0
Total Milage =		125.5	38.5				
Percentage of System =		70%	21%				

* Manhole repairs executed by Veolia-CPM group in 2018 as part of COR Manhole Rehabilitation Program

- The Maintenance group completed 1101 sanitary pump stations preventative maintenance tasks and 24 corrective maintenance tasks during in 2018
- Currently, fifteen Smart Cover monitors are installed in various locations within the City of Richmond sewer service area. The monitors allow for remote level monitoring of key locations known to have capacity or periodic blockage issues increasing the potential for SSOs.
- In June-2018 Veolia commenced implementation of strategies required to address the 2018 San Francisco Baykeeper settlement agreement, these strategies focused on activity that when combined would result in a reduction in SSO's and/or mitigate the extent of SSO's. The strategies employed included:
 - Updated pipe segment cleaning post-CCTV QA/QC
 - Updated CCTV of pipe segments having CCTV condition assessments being greater than 10-years
 - Updated pipe segment root control program

- Updated Hot Spot cleaning program
- Improved coordination of Veolia-O&M activity with Veolia-CPM activity to the betterment of each group's individual performance

Recommendations

- Continue O&M routine and hot-spot cleaning as required to maintain compliance with the current NPDES Permit
- Continue refining strategies to maintain compliance with the June-2018 San Francisco Baykeeper settlement agreement
- Continue close coordination of San Francisco Baykeeper settlement agreement Veolia-O&M activity with the Veolia-CPM group

Storm Water System

The City of Richmond storm system includes various features provided in Table 9.0 below. The system is vast and the currently known list of assets and their scale are greater than understood when Veolia began work in Richmond in 2004. In recent years, the addition of duck bills, flap gates and trash capture devices has expanded the asset list. Portions of the City's storm water collection system are located in unincorporated parts of the area away from the City core serviced by the sanitary sewer. The storm water system is roughly constructed in many areas with easements and aspects that are much more loosely defined and less understood than the sanitary sewer system.

Table 9.0

Storm Mainlines	142 miles
Storm Manholes	1685
Pump Stations	8
Flap Gates/Duck Bills	12
Corrugated Metal Pipes	5 miles
Overflow Weirs	2
Catch Basins	1529
Ditches	7 miles
Concrete Swales	12 miles
Storm Edges	11 miles
Infiltration Basins	4
Storage vaults,	4
Drop Inlets	1175
Trash Inserts (small)	125
Trash Inserts (large) GZRD'S	2
Curb Inlets	1834

Pipe Culverts	2 miles
Retention Basins	0
Outfalls	127
End walls	12
Inlets	222
Sluice Gates	11
Detention Basins	18
Treatment Vault	1

Veolia’s storm water O&M strategy, developed with City staff, is focused on maintaining the storm water drainage facilities based on available resources using a blended approach. The approach combines visual inspections and cleaning and televising programs utilizing performance measures (non-numerical, for example CCTV work for one week of every month) and metrics that can be evaluated based on targeted numeric values (for example number of inspections or total linear feet cleaned).

The operations and maintenance strategy is geared towards mitigating flooding issues, reducing storm water calls, reducing risk of property damage from flooding and also protecting public health and safety. The objective for televising storm pipes is to investigate and understand connectivity issues and to determine how various pipe segments fit together and convey storm water.

Program Metrics and Achievements

Month	Customer Calls	System Footage Cleaned	System Footage CCTV'd	Catch Basins Cleaned	Trash Capture Devices Cleaned and/or Inspected	Manhole Inspections	Point Repairs	Manhole Repairs
January	15	0	0	49	1	0	0	0
February	2	429	0	30	1	0	2	1
March	8	80	0	67	3	0	1	1
April	4	80	0	42	1	0	1	0
May	4	138	0	16	2	0	1	0
June	3	59	0	0	0	0	0	0
July	1	251	0	1	0	0	0	1
August	1	251	0	1	0	0	0	1
September	0	3000	90	12	4	10	0	0
October	8	2350	180	159	0	0	0	0
November	20	2350	140	20	0	0	0	0
December	6	0	88	11	0	0	0	0
Totals =	72	8988	498	408	12	10	5	4
Total Milage =		1.7	0.1					
Percentage of System =		1.0%	0.1%	27%				

2019 Recommendations

Similar to the 2018 wastewater collection system O&M Plan, develop and formalize a plan for necessary inspection and maintenance activities related to the storm water system.

Work with City GIS to update storm water system assets.

COMMUNITY:

- Member Richmond Council of Industries.
- Member Point Richmond Business Association
- Member Richmond Chamber of Commerce.
- Responded to odor complaint calls and treatment plant fence line monitor H2S alerts
- Attended periodic Point Richmond Neighborhood Council meetings.

ACTIVE SUPPORTER OR DONOR:

- YMCA of the East Bay
- Police and Fire Holiday Toy Drive
- Richmond Police Activities League
- Bay Area Clean Water Agencies (BACWA)
- Bay Area Consortium of Water and Wastewater Educators (BACWWE)

Continue paid OIT/Intern Program which preferably employs Richmond residents in rotating either wastewater operations or other relevant training for up to a year and a half. At the end of the training program the employees are expected to hire on to the Veolia Richmond project or, by virtue of experience and certification earned, be eligible for employment in the field of wastewater treatment operations with other agencies.

PROJECT SUPPORT STATUS / REVIEW:

Veolia Staff:

Paul Savage	Vice President of Operations, California
James Loven	Process Control and Management Support
Jeremiah Danielson	Veolia Water West Operating Services, Inc. Environmental Health & Safety Manager
Dennis Flosi	Instrumentation, Controls and SCADA/PLC
Tanya Barber	Human Resources

OPERATOR CERTIFICATION STATUS / REVIEW:

Facility: Wastewater Treatment Plant Contract Operator – Registration Number CO - 0010

Staff

Aaron Winer – Area Manager of Northern California – Bay Area and Richmond Project Manager

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CA Grade V Wastewater Treatment Plant Operator Certificate # 9895
CWEA Grade I, Laboratory Analyst, Certificate, # - 00013118
CWEA Grade IV, Environmental Compliance Inspector, Certificate # - 050744001
CWEA Grade II Industrial Waste Treatment Plant Operator, Certificate # - 244

Manny Molina – Assistant Project Manager; Chief Plant Operator
Grade V Wastewater Treatment Plant Operator, Certificate # 9777
Grade II Water Treatment Operator

Mike Beck – Operations Manager - Grade V Wastewater Treatment Plant Operator, Certificate # 44191

Kevin Barricklow – Lead Operator - Grade IV Wastewater Treatment Plant Operator, Certificate # 42965

Francis Rubio - Lead Operator - Grade V Wastewater Treatment Plant Operator, Certificate # 42857

James Beirn – Grade II Wastewater Treatment Plant Operator, Certificate # 40050

Malcolm White – Grade II Wastewater Treatment Plant Operator, Certificate # 43427

Shaun Verspui - Grade II Wastewater Treatment Plant Operator, Certificate # 39147

Joanne Le - OIT Grade I

Valerie Sakata - OIT Grade I