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COMMITMENT & INTEGRITY DRIVE RESULTS

HULL WATER POLLUTION CONTROL FACILITY

February
2019

MONTHLY OPERATING REPORT



NPDES NO. MA0101231

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Cover pictures:

View from D Street station toward A Street
Above ground fuel tank on the chain wall platform

1 EXECUTIVE SUMMARY

This Monthly Operating Report provides a summary of the pertinent information and activities that occurred at Hull WPCF during the month of February 2019.

- No lost-time incidents for the month of February.
- There were 128 effluent samples taken in the month of February. Please see page (8) for details.
- There were no effluent permit violations.
- Plant average flows were typical for this time of year. There were a few days of moderate rainfall during the month, but nothing significant. The dates were spread out some, and the impact on plant flows was low. The average daily flow for the month was 1.57 MGD, and the peak day was on 2/24/19 with a flow total of 2.26 MGD. 3.45 inches of rainfall was recorded.
- As noted last month, plant and collection system odors are low for this time of year. The Bioxide system at PS 3 remained off for the season.
- Asset Management Accounts checkbook for tracking of expenses is ongoing weekly for year #4. A summary of year-to-date totals for [04M]. Review of account status between W&C and Hull Sewer Dept. is on-going. A copy of latest account status is attached.
- There were no grinder pump call outs during the month of February that the staff responded to and corrected.
- In February, Fellows Electrical started the electrical conduit and wiring work related to the new AST. The 10-gallon fuel overflow tank was delivered and moving of the fuel lines to generator #2 was completed.
- W&C O&M working with engineering and HSD on the development of the "Critical Equipment" needs list for the SRF funded account.
- The Odor Scrubber Media Replacement project work was completed in early February, and the scrubber was returned to service. The disposal of the old media is pending approval.
- The Energy "Gap" work continued with Horizon on site and the control for the air flow meter programmed into scada.

Woodard & Curran strives to deliver a high-quality operations service and is responsive to our customers concerns. Please feel free to request any modifications to the format or content of this report.

2 FLOWS AND LOADINGS

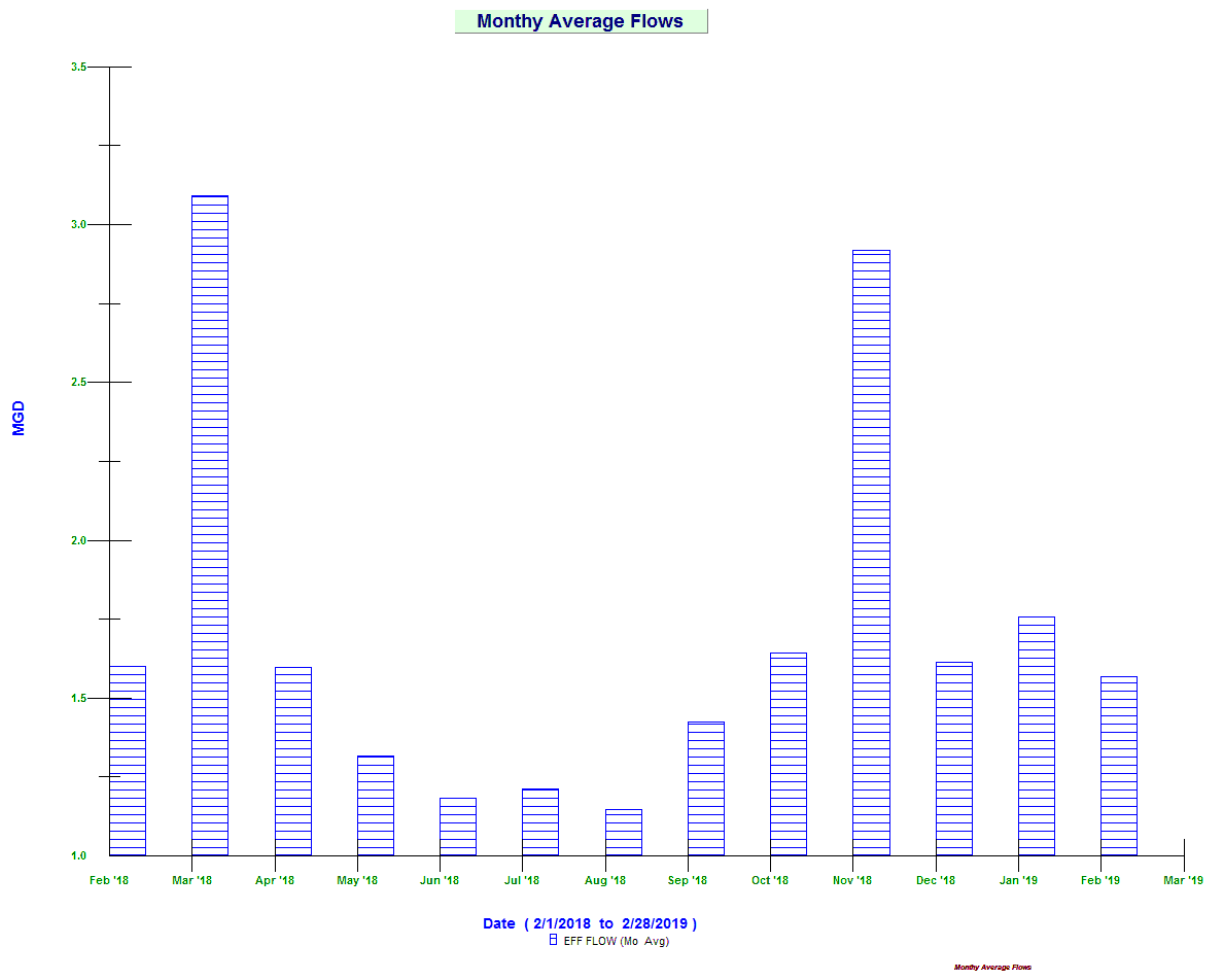


Average Daily Flows and Loadings for the Month:

	Eff Flow MGD	Inf Flow MGD	Inf BOD LBS	Inf TSS LBS	Eff BOD LBS	EFF TSS LBS
Feb 2017	1.967	2.295 *	1664	4324	170	410
Feb 2018	1.845	1.794 *	2518	2553	201	299
Feb 2019	1.755	1.968 *	1051	1679	123	170

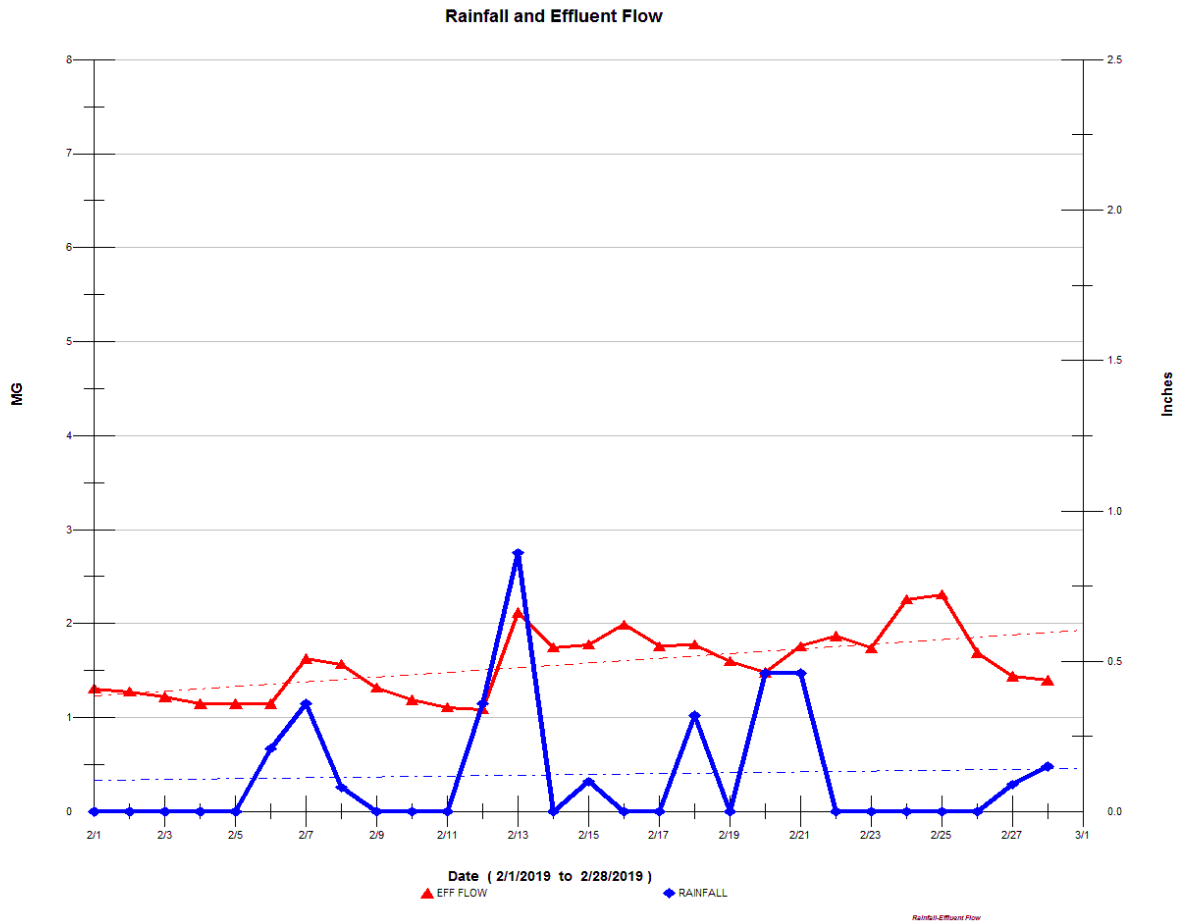
* Meter drift – influent flow meters are strap on doppler flow meters and the internal pipe condition prevents getting a strong signal. The staff adjusts accordingly and utilizes the area velocity meter in the aeration tank inlet channel as needed. All loadings are based on the effluent flow meter.

2.1 AVERAGE EFFLUENT MONTHLY FLOWS – ONE YEAR COMPARISON



Monthly average flow for February was 1.57 MGD, a typical amount for the winter period, and similar to February 2018. There was little to no snow recorded during the month of February.

2.2 MONTHLY SUMMARY OF RAINFALL AND THE INFLUENCE ON EFFLUENT FLOWS



This graph shows the days where plant flows were higher due to rainfall [Blue Peaks]. This graph provides a good indication of the influence that rainfall has on the effluent flows. Inflow and Infiltration out in the collection system has been noted with the increased effluent flow values when it rains.

3 COMPLIANCE



➤ Plant Effluent

- There were no exceedances for the month of February.
- Plant process conditions continue to be good & maintaining very well. The clarifier surface was good during the month. For much of the month only one secondary clarifier was necessary. Sludge settleability was good and chlorination of the RAS was stopped. The process solids inventory varied depending on plant flows and wasting schedule. All of the primary sludge generated is being pumped to the gravity thickener [GT] and co-settling with the secondary waste activated sludge. Due to lower odors for this time of year, the sludge blanket in the GT is allowed to be higher in order to achieve a higher sludge concentration for pumping to the sludge truck.
- Utilizing various aeration blower modes during the month, due to excessively high dissolved oxygen levels in the aeration tanks. Modes used were timed on and off mode during the daytime hours & restricting suction valve on blower to draw in less air to the system. Both modes saved on some electrical costs.
- Aeration Process mode remains in contact stabilization mode, with varying amounts of flow into aeration tank #1, depending on system inventory and flows.
- A Copy of the NPDES report for February 2019 was submitted to the DEP and then forwarded to the Hull Sewer Dept.
- Continued working with corporate team [Frank C & Alan F] for Scada to Hach Wims data management computer data export.
- The Drylet Trial continued and improved secondary effluent quality is evident. There is still some uncertainty as to the anticipated solids reduction, and W&C has decided to continue with the

program in order to monitor for a longer period of time. The variable plant flows contribute to the uncertainty of the amount of solids reduction, with the use of this product. The daily dose of product has been lowered due to lower loading and plant flows, in order to optimize use of the product. To date, the facility's biological system has adapted very well to the supplemental bacteria that is being added daily, and secondary clarifier performance is very good. As noted last month, the process scheme was changed in late December to the "contact stabilization" mode to lessen the solids loading on the secondary clarifiers.

Photos below show the current conditions as a result of lowering the sludge inventory and changing of process flow mode. The spray water that is typically on, was shut off during the very cold periods in January to prevent the freezing of the clarifier rake arm. These pictures were taken in February.



Secondary Clarifier - good clarity & no water spray



Aeration tank #3 – good solids level & color

- Kristina Richards [KR] working on Tier II annual reporting for the facility for certain chemical stored at the facility in 2018.
- KR also assisting with questions and updates needed for the permanent Above ground Storage Tank (AST) and Spill Prevention and Containment Control (SPCC) plan and decommissioning of the temporary AST when the time comes.
- SPCC: Plan for monitoring fuel stored at the facility. Regular inspections of the temporary AST, new AST and fuel day tank, as well at container storage of waste oil. Updated file.
- The 2018 annual sludge report was submitted electronically to the USEPA.

4 KEY PERFORMANCE INDICATORS



4.1 WATER QUALITY – FEBRUARY 2019

Parameter Info		Permit Requirements					Results				
Parameter	Units	Daily Max	Daily Min	Weekly Avg. Max	Monthly Avg. Max	Freq	Period Avg.	Period Min	Period Max	# of Samples	# of Violations
Eff TSS	MG/L	50		45	30	1 X Week	7.5	7.0	8.0	4	0
Eff TSS	LBS			1152	768	1 X Week	86.5	67.1	112.8		0
% TSS Rem	%		85			1 X Month	94.7				0
Eff BOD	MG/L	50		45	30	1 X Week	3.0	3.0	3.0	4	0
Eff BOD	LBS			1152	768	1 X Week	34.6	27.3	42.3		0
% BOD Rem	%		85			1 X Month	95.7				0
Eff Chlorine	MG/L	1.0			0.7	3 X Day	0.15	0.01	0.47	84	0
Eff Fecal	#/100 ML	260			88	1 X Week	10	10	10	4	0
Eff pH	SU	8.5	6.5			1X Daily	7.0	6.8	7.4	28	0
Enterococci	#/100 ML	276			35	1 X Week	10	10	10	4	0

- There were 128 effluent samples taken in the month of February with zero [0] NPDES Permit exceedances.

Gallons Treated vs Sludge Disposed

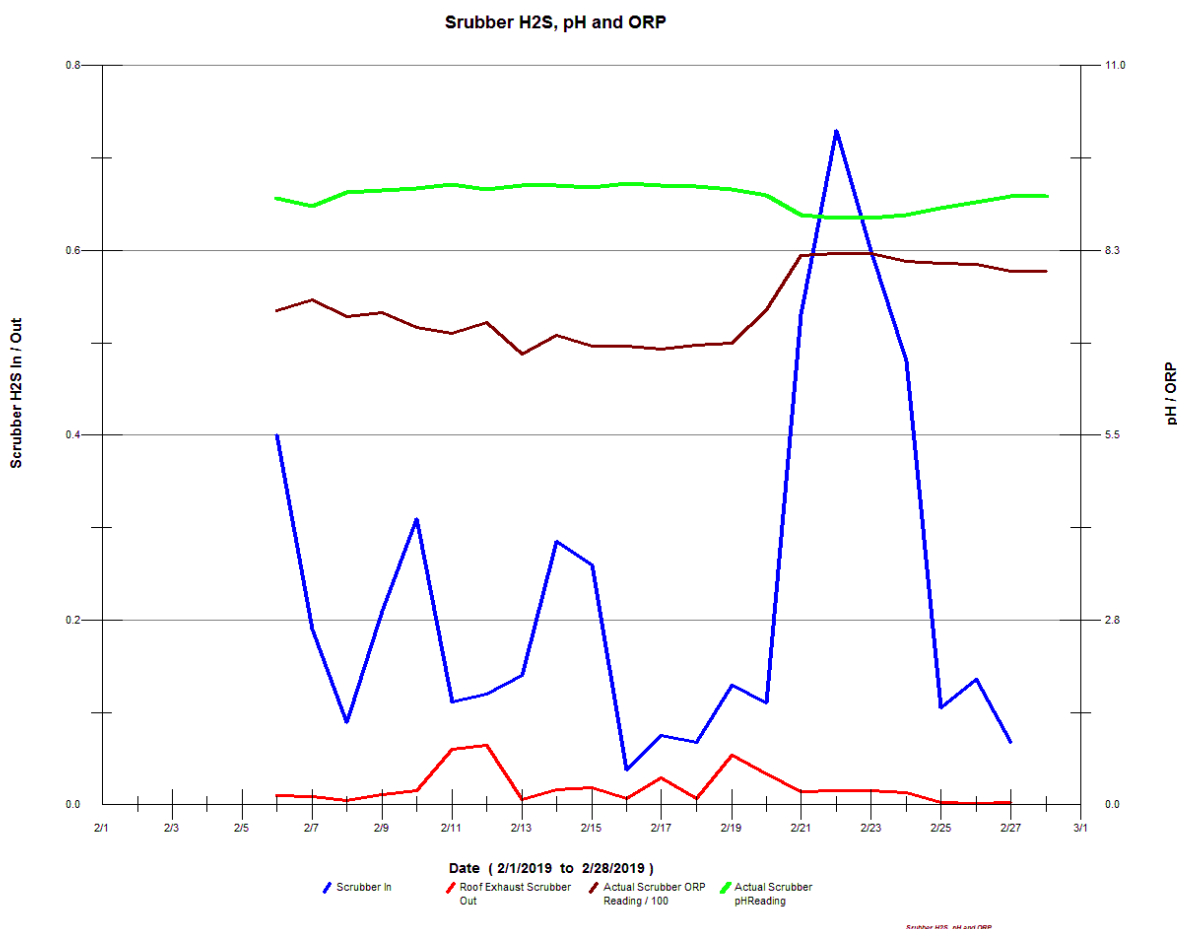
Month	Effluent Treated, MG	Sludge Disposed, Gals
February 2017	53.43	111,700
February 2018	44.84	111,500
February 2019	43.90	98,000

5 ODOR CONTROL

There were no odor complaints reported in February 2019.

The gravity thickener and primary clarifier were on for the month of February. Due to colder temperatures, and a high sludge inventory, it is necessary to keep these process units on line. The waste activated sludge currently is being pumped to the gravity thickener via the blend box. Aeration tank troughs are being flushed to minimize build-up of odors.

The odor scrubber system was off line for the first few days of the month to complete the media replacement. An odor letter was distributed to the neighboring residents, for possible odors. There was minimal odor inside the building. The colder temperatures were favorable to scheduling and completing the work. The spent media is waiting for approval for disposal. The six tote containers of spent material were covered, while being stored outside. W&C is working with Graham Waste for an approved disposal location and transport off site.



Graph shows some small peaks for H2S to the scrubber but these are all below 1.0 ppm. These [low blue] peaks are primarily due to the H2S generated in the primary sludge or gravity thickened sludge when sludge is pumped to the bulk sludge truck, and then the lines are drained to the headworks to prevent freezing until the next truck is scheduled to return and pump sludge.

Scrubber media removal



Removal of old scrubber media from vessel



Totes of old media – waiting for disposal approval

- “In-Pipe” bacteria addition continued with all 24 dosing stations operational. No additional actions taken for headworks sulfide reduction plan proposed by “In-Pipe. The inspection/replacement with full bottles took place on 02/08/18. All work being tracked on the Utility Cloud [UC]. In-Pipe’s technician assisted with the dosing station bottle changeouts, inspection of the dosing units, provided feedback on various maintenance tasks associated with the dosing stations.
- Continued the bi-weekly change outs of the bacteria bottles at three lift stations Microbe Dosing Stations (MDU’s) with installation just in front of the three largest pump stations [in the wet wells or manhole just prior to the station. [PS 3, PS 5, PS 9] The re-load plan is delivering an additional 5.4 liters per month in total (1.8 liters x 3 locations). The goal is to see if we get a step change and reduce odors, while at the same time potentially reducing sludge. This change is being monitored closely over the summer months, for pump stations and at the plant.
- On-going – frequent pumping of the secondary scum wells. Tank cleaning performed quickly and as needed.
- No [Bioxide] product added, system off for the winter period.
- Mixing systems/aerators all functional at the pump stations, except for pump station #3. New Medora Gridbee mixing system for PS 3 not installed yet. Mixer/Aerators at PS 4 & PS 6 are on timed control through SCADA. The plan is to add additional station mixers to timed control in the near future.
- Still in Progress – as requested discussing options for headworks area to reduce corrosion and odors with Tighe and Bond’s HVAC evaluation/upgrade.

6 MAINTENANCE SUMMARY

6.1 TASKS COMPLETED THIS MONTH

The SEMS monthly work order summary for February is compiled and attached as a pdf file for review. Please note that some scheduling changes for work orders was made for the pump stations and the plant to consolidate similar tasks for various equipment pieces [i.e. pump station generators, influent pumps, etc]. The service schedule was affected and therefore, tasks are indicated as “cancelled”

Key items of note are listed below.

- 1) The Deragger unit at PS6 continues to function very well with no issues. To date, the #1 pump has not needed any cleaning. An additional unit will be procured for pump #2. This unit will be installed in mid-April, when it comes in.
- 2) In-Pipe units – battery change out and circuit board troubleshooting and replacement as needed.
- 3) On-going issue – the need to add oil to sec clarifier gear boxes and the GT gear boxes. All of the units have leaks [lower gear box seals are no good]. We are using a flowable grease product that is heavier to lessen the amount of leakage. The estimated use of product is 2.5 gallons per week.
- 4) Weekly exercise without loads and Monthly load tests completed on all generators including the portable generator and pump stations.
- 5) Visits to D Street stormwater station as needed to ready/prime portable trash pump for back-up use. With the cold weather conditions, the trash pump “readiness” involved draining the pump on the extreme cold days, and re-priming when tides were expected to be high during the heaviest rainfall periods. The pump also needed some maintenance to address corrosion issues on the starting circuit and chassis. One of the 4-inch submersible pumps stopped working in late January and found to be clogged with debris [old plastic baseball bat]. The pump was removed and cleaned out. Re-installation planned for early March.



Photo of kid's baseball bat removed above

- 6) On-going Dig-Safe mark outs completed, due to emergencies, upcoming paving projects, and responded various rattling manhole covers, broken manhole covers/rims, sunken manholes covers/rims. All work that W&C completed is documented in the monthly Work Order Report and utility cloud.



- 7) E-1 grinder pumps. The current plant inventory of new and rebuilt spares is 8 units.
- 8) Had Comm-Fail issues related to LS A, and Verizon was able to resolve on same day [2/13]
- 9) MCC on 1st floor – electric bucket safety issue corrected, with proper disconnect device.



- 10) Install rebuilt rotating assembly for RAS pump #3 [old PACO pump assembly]

6.2 ON GOING PROJECT UPDATES



- Drylet bacterial process enhancement trial continued in February. [See effluent/compliance section].
- Pump Station 4, Pump Station 9, and Plant Headworks are now being evaluated together for a structural concrete repair design and bid to be done as part of an on-call services agreement with a contractor. The details are still being evaluated. As noted, before, the mechanical work is being held up at pump station 4 due to structural safety concerns.
- The sluice gate supports for the inlet gates to primary clarifiers at the D-box. As noted previously, the supports have lifted away from the concrete and there is also cracked concrete under the supports
- Still looking at an alternative use for one of the existing primary clarifiers, especially the #1 PC, since the drive unit has extensive damage. Conversion to a mixed tank and floating aerator are being considered. This would allow for hydraulic flow into the tank, and not restrict flow at the D-box, which is currently a concern, as having the primary tanks off line in the warmer months eliminates many of the odors around the facility. This item is being considered under the SFR Critical needs equipment. A couple of budgetary quotes have been received.
- Pump Station #1 – The new pumps are currently operating normally. Out put flows from each pump are being investigated to determine how higher capacities could be reached. Pressure tests and draw downs / flow testing was completed in January and found slightly higher pressures are contributing to lower outputs than the original design points. In review of prior reports and investigations it was determined that the pump capacities were always lower than the designed points, going back to the 1980's. It was also found that the motors are not reaching their full load amps and have approximately 25% more available amps that handle an increase in flows if the impellers are upsized. Aram & Bill are working on summarizing the findings and evaluating larger impeller trim sizes to take advantage of the existing available motor power.
- Four new yard hydrants are on-site and W&C plans to work with Aqualine Utility for the installation/replacement of the failed units. The yard hydrant replacement is planned [weather permitting] in late February/early March, along with the necessary pipe adapters, valves, gate boxes as needed. The broken valve for the gravity thickener outlet is also scheduled for replacement.

- A ladder replacement package went out to 3 contractors originally and recently in February a forth contractor that specializes in fabrication has provided a quote. The ladder replacement package included 12 different ladders throughout our 7 sewage pumping stations. A summary was provided to the client on the purpose and intent of the ladder replacement project with the main goal of addressing the non-OSHA compliant existing ladders as well as additional wear and tear issues with the existing ladders. At this time the quotes are on hold until W&C and Town of Hull determine the best way and time to move forward with selecting a contractor and moving forward with construction / replacement.
- The Horizon energy grant work was completed in February with a final automated actuator and flow meter installed and now communication through SCADA. This modification and plan is working very well at the present time and saving the electricity equivalent of a **20 horsepower motor**. Additionally, the Air Scrubber fan had a VFD installed and in combination with the scrubber media replacement project the VFD speed as been able to be significantly reduced approximately 25% providing electrical cost savings. W&C is working on additional SCADA programing to track the scrubber fan VFD energy usage.
- The co-ordination with Duperon for a site visit to inspect the influent channel flex rake is still being worked on. They have not had an available technician scheduled for our area. They were booked through the winter months and had no scheduled area visits planned

Please see the attached summary of the Asset Management accounts for contract year (4)

7 SAFETY



It is Woodard & Curran's policy to maintain a safe and healthy work environment for every employee and to comply with applicable occupational health and safety regulations.

- No lost-time incidents for the month of February
- Ongoing - Daily safety briefing meetings, review site safety policies with sub-contractors, safety tailgate topics.
- Pure Safety topic– February – “Driver Fatigue”
- Continued working with Andy Rowe on pump station ladder standards & specifications for replacement and other safety related issues.
- Working on review of confined space permits for past year – filling out, sign-offs, completion.
- Evaluating & calibrating the facility's 4-gas personal gas meters. Some new components are needed – various sensors and rechargeable batteries were ordered from Apollo Safety Co.
- Monthly staff safety meeting conducted on 2/20/19
- Safety stand own discussion held on 2/13/19 for grating plank injury that occurred at one of the project sites.
 - Job aid: OSHA Recordkeeping & Form 300A posted for 2018
 - Discuss driving safety & pedestrians
 - Confined space inventory review
 - Lessons Learned from January 2019 - Near misses and incidents from other company projects.
 - Confined space characterization form and criteria
 - PPE needs.
 - Voluntary Respirator Request Form [applies to some of the staff]
- Storm Readiness updates provided as requested.
- Emergency Lighting fixtures being replaced where needed, based upon monthly inspection.

8 STAFF DEVELOPMENT

Training is an important part of any operation to ensure employee health and safety is assured, quality standards are maintained, staff skills are improved, career opportunities become available, and higher productivity is achieved.

Listed is a general outline of training that the staff received over the course of the month:

- W&C new intern Ryan Holman continued his internship that had started on 1/7/19. He is already assisting operations and maintenance with various projects. He is now performing facility daily rounds, assisting with general operations and maintenance activities, inputting of data into the Utility Cloud. The internship is set to conclude on 3/1/19.
- Monthly staff Safety training – completed – Pure Safety and monthly safety meeting.
- Operational updates and process control discussions, especially with recent electrical issues and plant shut-downs, pump station operations, odor issues, dig-safes, etc.
- W&C “near-miss” incidents at all projects for February discussed.
- Jim G continues to work with staff on various SEMS updates – work order management & scheduling.
- Utility Cloud training occurred early February 2019. Alan Fabiano and Andrew Crawford visited the facility to provide system overview and updates.
- Ryan H presented his summary presentation for the internship to the staff on 2/28/19.

Staffing related items:

- Continued involvement with Mass Maritime [MM] internship program/career fair for future interns. Corporate human resources department leading the effort for future intern for summer months. Some selected candidates to be interviewed in the coming weeks for the summer internship.
- Sunday rotation schedule in place with Jim Gagliard working every other Sunday, and remaining weekends being filled by Roger B., Aram V., and Bill B. When Bill is not scheduled for a Sunday, he will be on a Monday-Friday schedule.
- Supplementing staff needs with O&M tech support where needed. Jim G and Jody S providing coverage when staff levels are lower due to sickness, vacation, or training.

9 COLLECTION SYSTEM

9.1 WET WELL CLEANING

The actual schedule for wet well cleaning: May 2018 to April 2019:

(X-Cleaned) - (Orange – Inspected) - (Green – See notes) - (blank – no work done)

Frequency of cleaning	Pump Station							
	A	1	3	4	5	6	9	D
May, 2018		X			*1	*1		
June, 2018					X	X		
July, 2018					*2			
Aug., 2018					X			
Sept. 2018				#3	#3		#3	
Oct., 2018	X	X	X	X	X		X	
Nov, 2018	#4	#4		#4	#4	#4		
Dec., 2018					X			
Jan., 2019								
Feb., 2019								
March 2019								
April 2019								

All pump stations except for Pump Station 3 and Station D have an aerator/mixer in the wet wells

- *1 Inspected and needs to be cleaned in June**
- *2 Inspected and needs to be cleaned in August**
- *3 Inspected and needs to be cleaned in October**
- #4 Wet wells were not inspected this month**



PS 5 has aerator, but also collects the most debris of all of station wet wells

9.2 COLLECTION SYSTEM MAINTENANCE

Woodard & Curran assisted/conducted camera work in the Hull collection system at the following areas during the month of February.

- Hull Estates at Avalon/Nantasket- MH [cracked frame]
- Summit Ave.
- 110 Atlantic Ave.
- Allerton Hill
- 410 Nantasket Ave.
- Rockland House Road.

Manholes:

- Staff responded to various rattling manhole covers, broken manhole covers/rims and sunken manholes covers/rims.
- Flagged & replaced a number of manhole covers where requested/notified.

Dig Safe mark outs:

- Numerous Dig-Safe mark outs were completed throughout the Town of Hull in order to assist/facilitate the Town's paving project and the emergency repairs of the broken water lines.
- After-hours dig-safe mark-outs for various water emergencies were conducted as requested.

Collection system work is being documented and tracked in Utility Cloud and a summarized report for the month of February has been included as an attachment with the Monthly Operating Report.

10 PROJECT MANAGEMENT & ADMINISTRATION



10.1 ON-GOING PROJECTS AND SUPPORT ITEMS

- Asset management checkbook for tracking of expenses. Review of account status between W&C and Hull Sewer Dept. is on-going. [04M]. The report information is available to the Sewer Department and located in the shared file location. **The current snapshot of the account status as of 3/27/19 is included as an attached pdf file with this report.**
- On-going AST work: CommTank and Fellows electric worked in February on final AST appurtenances and electrical installations. In March Steve Rose will be working with Fellows electric on SCADA communications and all work related to this project is anticipated to be completed in March and the new AST to be fully online. Demo of the existing temporary tank and piping will also be completed in March.
- Utility Cloud [UC] is currently being used for collection system related asset tracking. The system is being utilized more and more with positive results. The recently completed Tie-Card uploads into utility cloud in last December is making the program much more usable and efficient, as all users can access tie-card information from any location, from a computer or cellular device [phone]. In February an onsite training work shop was held for W&C staff and the Town to learn more about UC and to feel more comfortable with Utility Cloud use and capability. Pete Lyons and Bill Boornazian are working on ways to backlog all of the CCTV and Manhole inspections information into the system. This would mean that all collection system data can be tracked, accessed and reviewed from one location. Ryan H [intern] uploaded all of the manhole inspection data into the UC. **A copy of the UC printout for February is attached.**
- Assisted AST project contractor with 2nd floor storage area equipment relocation so that the fuel lines could be installed along the building wall. All stored equipment, supplies, and records were moved out so welding of pipes could be completed. Plans underway to re-organize stored materials & equipment, prepare a list of equipment to be classified as surplus for removal from the plant, and install larger racks for storage.
- SSO summary spreadsheet compiled for 2018 to be included with 2018 CMOM Annual Report.