



[woodardcurran.com](http://woodardcurran.com)

COMMITMENT & INTEGRITY DRIVE RESULTS

# HULL WATER POLLUTION CONTROL FACILITY

April

2019

## MONTHLY OPERATING REPORT



NPDES NO. MA0101231

# **Table of Contents**

1	Executive Summary .....	2
2	Flows and Loadings .....	3
2.1	Average Effluent Monthly Flows – One Year Comparison .....	4
2.2	Monthly Summary of Rainfall and the Influence on Effluent Flows.....	5
3	Compliance.....	6
4	Key Performance Indicators.....	8
4.1	Water Quality – March 2019 .....	8
5	Odor Control.....	9
6	Maintenance Summary.....	11
6.1	Tasks Completed This Month.....	11
6.2	On Going Project Updates.....	14
7	Safety .....	16
8	Staff Development .....	17
9	Collection System.....	18
9.1	Wet Well Cleaning.....	18
9.2	Collection System Maintenance.....	18
10	Project Management & Administration .....	20
10.1	On-Going Projects and Support Items.....	20

**Cover pictures:** Views from above – Hull wastewater treatment facility – April 2019.

# 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 April 2019.**

- No lost-time incidents for the month of April.
- There were 138 effluent samples taken in the month of April. Please see page (8) for details.
- There were no effluent permit violations.
- Plant average flows were slightly higher but typical for this time of year. There were a several days of moderate to heavy rainfall in last third of the month. The rain event on April 22<sup>nd</sup> to 23<sup>rd</sup> caused plant flows to rise to near 5.0 MGD. There were no issues at the plant, although some of the pump stations went into high alarm due to excessive I&I. The average daily flow for the month was 1.86 MGD, and the peak day was on 4/23/19 with a flow total of 4.83 MGD. 2.9" of rainfall fell on 4/21-24/19. A total of 10.72 inches of rainfall was recorded for the month.
- As noted last month, plant and collection system odors were low for this time of year. The Bioxide system at PS 3 remained off for the season. Plans are underway to resume the system operation in late May.
- 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. A few outstanding charges need to be applied.
- There were 5 grinder pump call outs during the month of April that the staff responded to and corrected.
- In April, all Punch List items were complete on the AST and engineering support started record drawings.
- W&C O&M continued working with engineering and HSD on the development of the "Critical Equipment" needs list for the SRF funded account.
- The disposal of the old media from the scrubber media replacement project was completed.
- The Energy "Gap" work was completed and air valve programming/set up for the new air flow meter in Scada done.
- AST outstanding items completed – leak detection interface card, pipe painting, & battery shelf for the back-up battery unit

**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



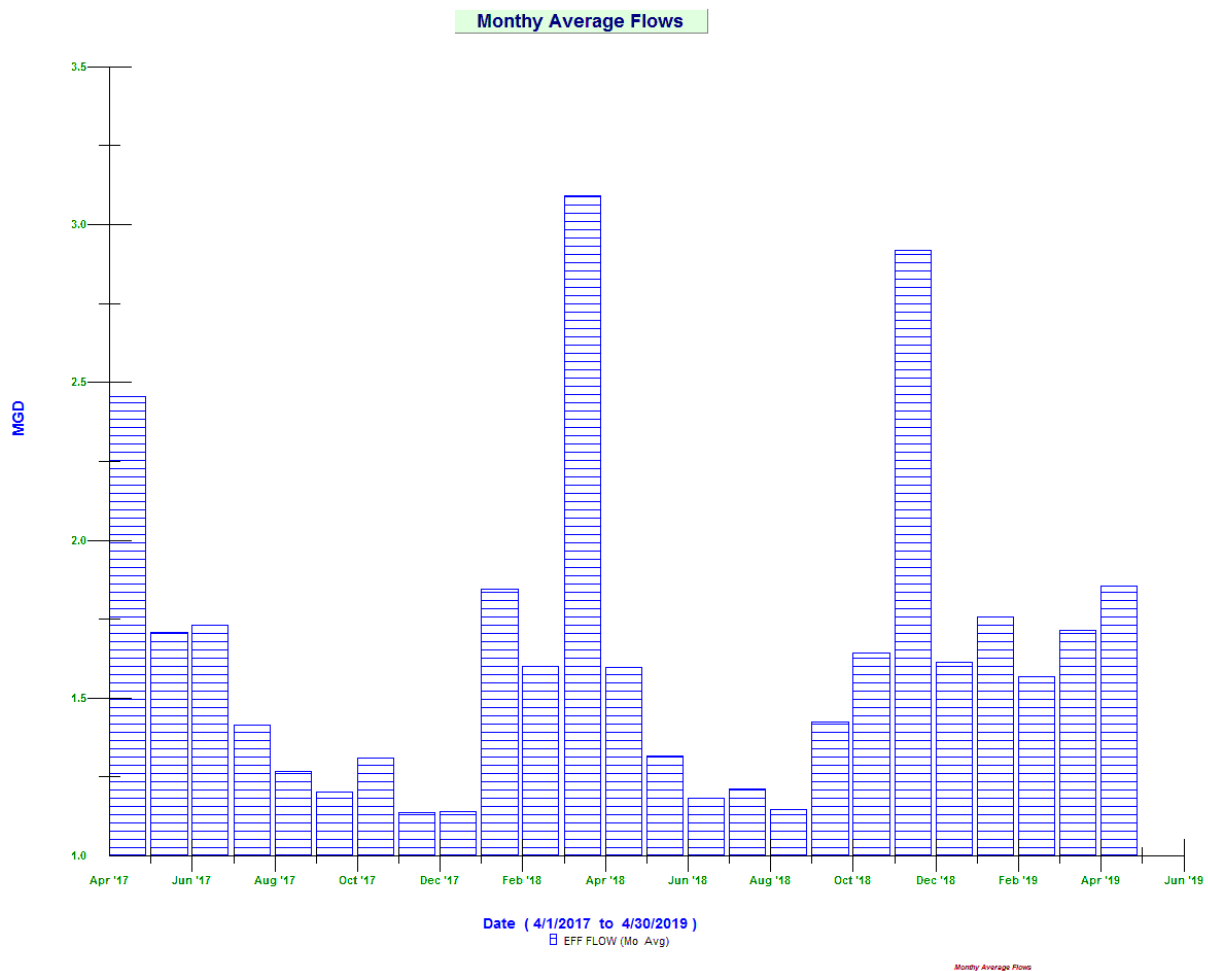
### Average Daily Flows and Loadings for the Month:

	Eff Flow MGD	Inf Flow MGD	Inf BOD LBS	Inf TSS LBS	Eff BOD LBS	EFF TSS LBS
April 2017	2.456	2.684 *	1724	3653	79	217
April 2018	1.596	1.891 *	1274	1962	72	163
April 2019	1.856	2.202 *	1246	1835	101	168

\* 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.

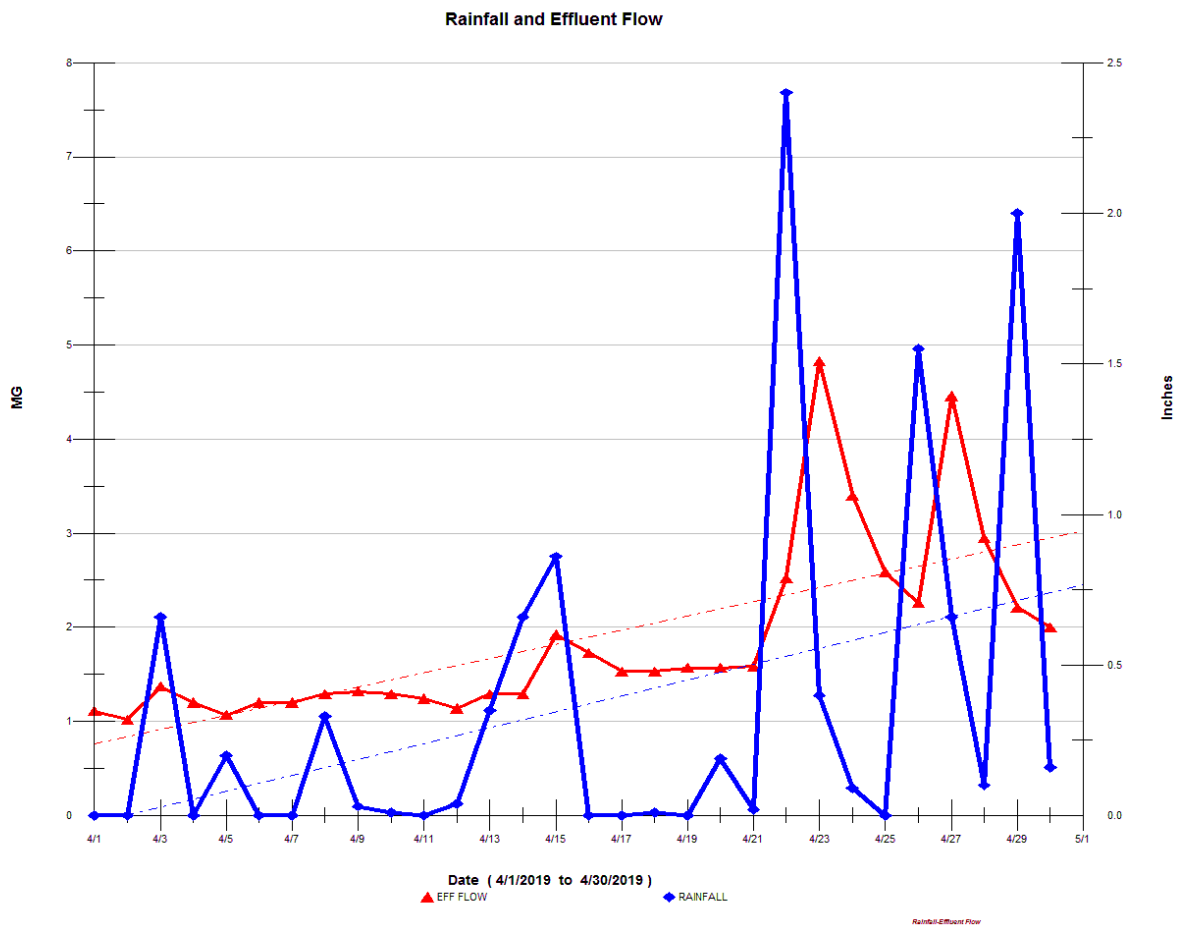


## 2.1 AVERAGE EFFLUENT MONTHLY FLOWS – TWO YEAR COMPARISON



Monthly average flow for March was 1.86 MGD, a fairly typical amount for this year's spring period, and slightly higher than March 2019. There was one significant rain event in late April. Total precipitation, however, was 10.72 inches. The graph shows a 2-year summary of the monthly average flows.

## 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 had 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 April.
- Plant process conditions continue to be good & maintaining very well. The clarifier surface was good during the month. Only one secondary clarifier was necessary until the last 10 days of the month when the second tank was put on line due to high instantaneous flows due to excessive rainfall. Sludge settleability remains good and no chlorination of the RAS was needed. 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 was allowed to be higher in order to achieve a higher sludge concentration for pumping to the sludge truck.
- Aeration Process mode remains in contact stabilization mode, with varying amounts of flow into aeration tank #1, depending on system inventory and flows. This mode allows for lower solids loading to the secondary clarifiers.
- A Copy of the NPDES report for April 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 continues, and improved secondary effluent quality is very evident, especially during higher flow days. There is still some uncertainty as to the anticipated solids reduction. W&C is continuing with the program in order to monitor plant performance over 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 was put back to the original “2 scoops” dose. To date, the

facility's biological system continues to operate very well with the supplemental bacteria that is being added daily, and secondary clarifier performance is very good.

Photos below show the current conditions with the plant in contact stab mode process flow mode, with some feed to aeration tank #1 also. Good settling characteristics in secondary sludge and low turbidity in clarified effluent.



- Kris Richards updated the facility's SPCC plan and inspection forms, since the new fuel tank is on-line. Also, reviewing spill containment issues for the Godwin pump and portable generator. Looking at possible solutions.
- SPCC: Regular inspections of the temporary AST, new AST and fuel day tank, as well as container storage of waste oil. Updated file.
- Per request of the MA DEP Watershed Section, provided back copies of toxicity testing conducted in 2013-2014.



## 4 KEY PERFORMANCE INDICATORS



### 4.1 WATER QUALITY – APRIL 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	8.8	5.0	12.0	5	0
Eff TSS	LBS			1152	768	1 X Week	168.4	68.1	443.1		0
% TSS Rem	%		85			1 X Month	92.1				0
Eff BOD	MG/L	50		45	30	1 X Week	5.3	3.2	8.0	5	0
Eff BOD	LBS			1152	768	1 X Week	101.4	46.2	269.9		0
% BOD Rem	%		85			1 X Month	93.5				0
Eff Chlorine	MG/L	1.0			0.7	3 X Day	0.19	0.01	0.76	90	0
Eff Fecal	#/100 ML	260			88	1 X Week	10	10	10	4	0
Eff pH	SU	8.5	6.5			1X Daily	6.9	6.7	7.2	30	0
Enterococci	#/100 ML	276			35	1 X Week	24	10	160	4	0

- There were 138 effluent samples taken in the month of March with zero [0] NPDES Permit exceedances.

#### Gallons Treated vs Sludge Disposed

Month	Effluent Treated, MG	Sludge Disposed, Gals
April 2017	73.67	144,000
April 2018	47.89	177,000
April 2019	55.69	152,000

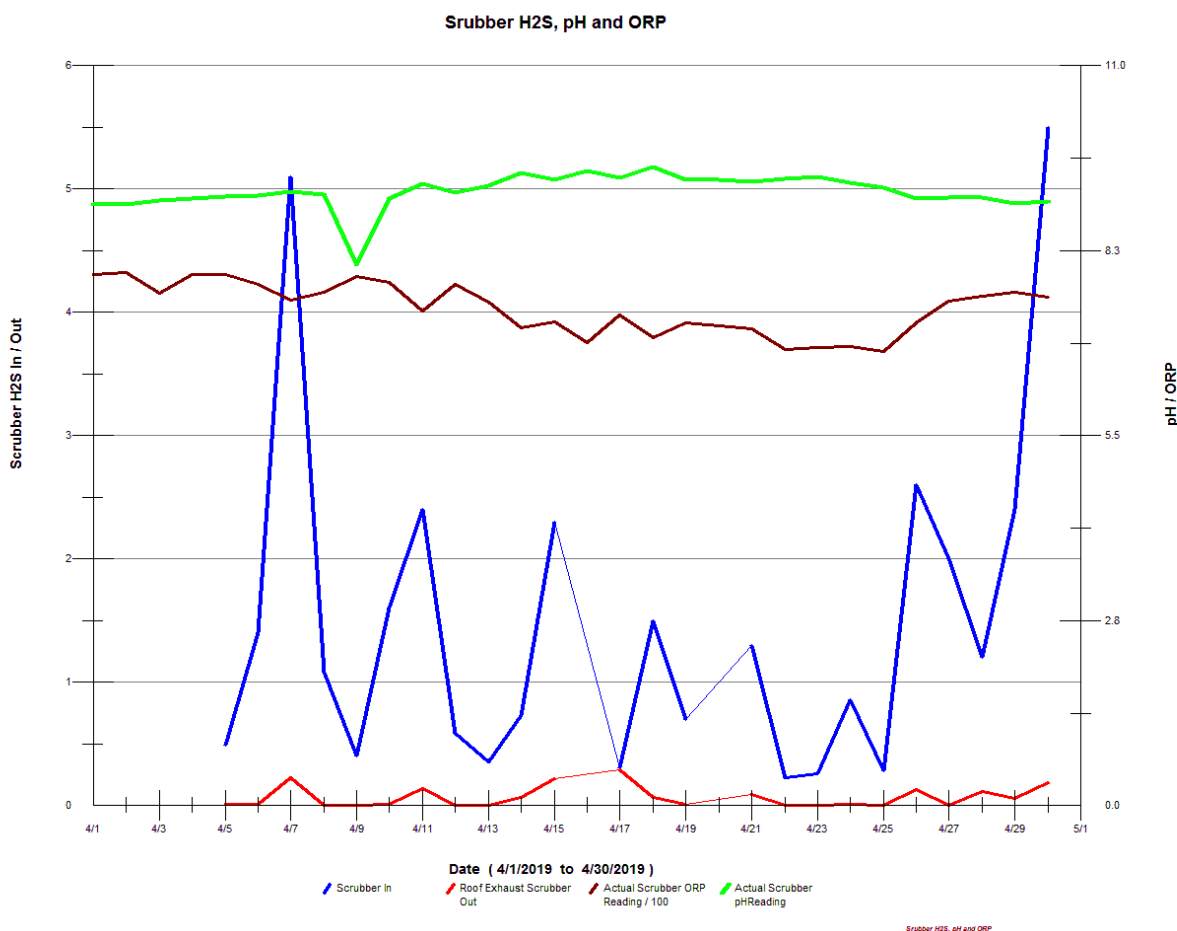
## 5 ODOR CONTROL

There were no odor complaints reported in April 2019.

The gravity thickener and primary clarifier were on for the month of April. It is necessary to keep these process units on line, since these unit processes allow for thickening and collection of sludge. The waste activated sludge is pumped to the gravity thickener via the blend box. The above ground sludge storage tank is off line, since the tank cannot be used in the winter months, due to freezing temperatures. Aeration tank troughs are being flushed to minimize build-up of odors.

The odor scrubber system was on line for entire the month. The scrubber fan speed was lowered due to less hydrogen sulfide production, and electrical savings are possible with the lower energy needed to run the fan.

The spent scrubber media is currently on site and waiting for approval for disposal. The six tote containers of spent material are 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 [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. The portable H2S meter was not operational for the first several days of the month, until the loaner unit was delivered.

- “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 04/10/19. Additional kick-start vegetable protein and bacteria were added to all locations during the monthly service visits. The program will follow this plan monthly over the summer months to evaluate overall effectiveness and odor reduction. All work being tracked on the Utility Cloud [UC]. In-Pipe’s owner, Doug Fagans, visited the facility on 04/24/19 to discuss program effectiveness and needs.
- 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 remains off for the winter/spring period. System restart is targeted for late May.
- 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.

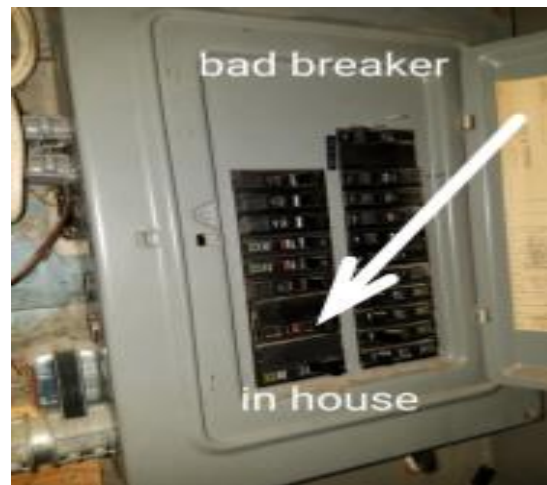
# 6 MAINTENANCE SUMMARY

## 6.1 TASKS COMPLETED THIS MONTH

The SEMS monthly work order summary for April is compiled and attached as a pdf file for review.

Key items of note are listed below.

- 1) The De-ragger unit for pump #1 at PS6 continues to function very well with no issues. No additional cleaning needed. The new de-ragger unit was ordered for pump #2 was installed on April 10, 2019. The #2 pump was cleaned just prior to the “de-ragger” unit being installed. To date, there have been no clogging issues.
- 2) In-Pipe units – battery change out and circuit board troubleshooting and replacement as needed.
- 3) On-going E-1 Pump repairs. The following E-1 Grinder Pumps were replaced:
  - 20 Nantasket Ave
  - 69 Gosnold St.
  - 21 Richards Rd
  - 50 Nantasket Ave [see attached pictures below for service call on 04/04/19, pump chamber was full of water and debris. Rosano-Davis cleaned out the pump chamber.



- 7 Salisbury St. – See attached pictures below - Met with Bill Burke GC for property on 4/16/18 and their electrician and explained problem with damaged cover, riser, and connector as well as the damaged control box cover. It appears cover related damage may have occurred when trees and shrubs were cleared over past few weeks. Unclear why connector was damaged. They were advised to contact Rosano-Davis to see about expediting the repairs and coordinate through HSD so that new connector piece installed before pump is re-installed. Owner was responsible for the costs.





- 4) 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.
- 5) Weekly exercise without loads and Monthly load tests completed on all generators including the portable generator and pump stations. Annual transfer switch [ATS] maintenance completed by NETS. Load test/check all generators at plant and pump stations. At the plant, go through sequence to allow the back-up generator [#2] to operate. No issues.



- 6) On 4/11/19 - Power transfer to Gen1 so that HMLP work could be done on new transformers & overhead wiring. On generator power for about 4.5 hours - no issues - 850am to 125pm.
- 7) Various yard/groundskeeping tasks performed to clean up plant site from winter season – tree branches, brush, other. Check out and ready yard equipment – mowers, trimmer, etc.

- 8) Rotary sludge thickening [RST] – resume process thickening and use of the above ground storage tank. There were some issues with the restart of sludge thickening this spring due to “old” sludge in the holding tank. Checked and cleaned many of the system components in search of the reasons for higher polymer use and poor thickening. A supplemental spray wash bar was installed on the unit to assist with the drum cleaning. The polymer mixing system was fully disassembled and cleaned. While functional, the polymer mixing unit has some worn components and deemed obsolete by supplier.



- 9) Sodium hypochlorite system – manifold cleaning as needed, due to debris in lines.
- 10) Install new 6-inch plug valve on suction manifold to replace seized gate valve.
- 11) Aeration blowers - #2 correct oiler issue for bearing, had been using higher amounts of lubricating oil.
- 12) Install new 6-inch plug valves on secondary scum cross-over pipe to replace failed valves.
- 13) PS 9 sump pump issues – check and clear line, but suspect that sump pump is tied into old bubbler system line, since the original discharge pipe is rotted.



Sump discharge on mid-level



sump pump in lower level

- 14) Visits to D Street stormwater station as needed to ready/prime portable trash pump for back-up use. Both of the 4-inch submersible pumps were operational.

- 15) A significant number of Dig-Safe mark outs completed, due to emergencies, upcoming paving projects, water main replacement work. Responded to all calls regarding 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.

## 6.2 ON GOING PROJECT UPDATES



- Drylet bacterial process enhancement trial continued in April. [See effluent/compliance section].
- 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. Output flows from each pump are being investigated to determine how higher capacities could be reached. Pressure tests and drawdowns / flow testing was completed in January and found slightly higher pressures are contributing to lower outputs than the original design points. The pump assemblies were checked in March and found to be clear of any debris. 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.



- The co-ordination with Duperon for a site visit to inspect the influent channel flex rake is still being pursued. 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.
- Pump Station 9 [PS 9] – Currently operational, but both pumps have leaking mechanical seals. One of the pump assemblies was replaced with a used one for the short-term, while service is being done on the removed pump assembly. The spare assembly has been repaired. A new check valve and valve are on order that will be replaced in late May/early June. PS 9 structural and overall station condition is part of the larger structural project being discussed.
- Working to schedule completion of PS 4 area CCTV and vector work before paving project begins. Gravity sewer line to the wetwell and force main line cleaning and CCTV. The work will require plugging of the gravity sewer lines, and pump & haul trucking while work being conducted. National Water Main Co. will be scheduled in early to mid-May.

**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 April.
- Ongoing - Daily safety briefing meetings, review site safety policies with sub-contractors, safety tailgate topics.
- Pure Safety topic– April – “Driver Safety Awareness Refresher”
- Monthly staff safety meeting conducted on 4/29/19
  - Electrical cord safety – tool-box topic
  - Cumulative trauma injuries – tool-box topic
  - Lessons Learned from March 2019 - Near misses and incidents from other company projects.
  - Review recent National Grid trench incident
  - Tick guidance/safety
- Annual Host & Crane inspections scheduled for early May.

## 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 intern Ryan Holman completed his internship that had started on 1/7/19 in March. He still remains on staff in a part-time role, coming to the facility for one day every 2 weeks for various projects.
- 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 March discussed.
- Jim G continues to work with staff on various SEMS updates – work order management & scheduling.
- Various staff members signed up for spring training seminars to prepare for wastewater certification exams and continuing education training hours for license renewal.
- Bill Boornazian attended the W&C Manager’s Meeting – early April.

### Staffing related items:

- Cody Piepenbrink submitted letter of resignation from full-time position [effective 4/26/19]. HE is leaving the company to pursue other career opportunities. He will remain on the “on-call” list for plant coverage and emergencies for the near term. A job posting for the position was initiated mid-month, with a job offer letter made to recent intern Ryan Holman.
- 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.
- A summer intern was selected from a pool of candidates that visited the facility. Andrew Zamanian, a junior at MM will be starting the summer internship in late June.
- 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.
- Provided a courtesy tour to of Hull facility Chief Operator of the Scituate, MA WWTF, William Blanton on 4/17/19.

## 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					X			
April 2019								

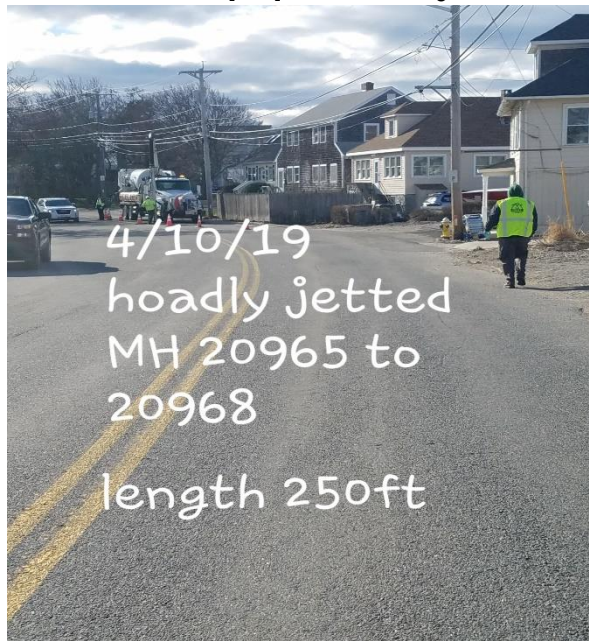
All pump stations except for Pump Station 3 and Station D have an aerator/mixer in the wet wells

- \*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**

### 9.2 COLLECTION SYSTEM MAINTENANCE

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

- Summit Ave
- 152 Atlantic Ave
- Nantasket Ave by DCU bath house
- 128 Cadish – dye test
- Menice Field/Avalon Estates
- DPW assistance – Helen Street storm drains



#### 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, broken sewer laterals due to gas main work.
- After-hours dig-safe mark-outs for various water emergencies were conducted if requested.

**Collection system work is being documented and tracked in Utility Cloud and a summarized report for the month of April 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 5/20/19 is included as an attached pdf file with this report.** Worked on developing 05M checkbook spreadsheet with proposed maintenance task plan for the year.
- Provide pricing breakdown for the Year (5) invoicing details with a cover letter outlining the CPI-U increase and the new budget amounts.
- All AST work is now complete including the remaining punch list items: Tacky paint on piping removed and repainted by Commtank, battery backup shelf unit installed by Glenn Fellows, new IO card for leak protection system installed by Commtank, and all SCADA alarms configured by W&C / Steve Rose.
- Utility Cloud was fully operational during the month of April with more and more work being tracked through the GIS / asset management / cloud-based program. Work is intended to grow each month as the staff works with Bill and Andy Crawford on specific work flow usage in Hull. **A copy of the UC printout for April is attached.**
- Researching several options and obtaining quotes for D Street Stormwater station to remove the existing vertical turbine pump, while keeping the existing roof in place and using the existing electrical service. A summary will be provided on the project approach in May.
- Continued to work with the W&C engineers on task order projects: Headworks bypass, sampling of existing coatings in headworks, critical spares – equipment specs, effluent pump room

- Developed an updated sticker for the E-1 control boxes, since many have faded and an updated call procedure is currently in place. A draft copy is attached. The new stickers will be affixed to the town-owned E-1 control panels this summer [by summer intern]

