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COMMITMENT & INTEGRITY DRIVE RESULTS

HULL WATER POLLUTION CONTROL FACILITY

June
2018

MONTHLY OPERATING REPORT



NPDES NO. MA0101231

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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 June 2018

- No lost-time incidents for the month of June
- There were 136 effluent samples taken in the month of June. Please see page (10) for details.
- There was one [1] sanitary system overflow notification reported [SSO] at Lift Station A. This was a result of a bypass drain back valve failure while testing bypass hook up procedures at this location.
- The Bioxide system at PS 3 was started on 6/15/18. The first chemical delivery was on 6/13 and Evoqua's technician was on site for equipment check out/start-up.
- Asset Management Accounts checkbook for tracking of expenses is ongoing weekly for year #4 [04M]. Review of account status between W&C and Hull Sewer Dept. is on-going. Continued working on close out for year 3 [03M] costs.
- The electrical tie-in from the HSD trailer remains, as continued monitoring of the plant's electrical voltage continues. No new findings to date, no interruptions to date, and next steps are still uncertain.
- There were 3 grinder pump call outs during the month of June.
- The Underground Storage Tank Removal Project/Above Ground Fuel Storage Tank continues. Working with Comm Tank for UST tank removal planning effort, reviewing wave analysis, and structural design.
- Main [lead] generator heat exchanger replacement - alternative vendors being contacted for proposals, due to high cost and lead times to manufacture, since the original supplier/manufacture no longer supplies these units.
- For all pump stations with sewage bypass connections, additional elbows and quick disconnect fittings installed so that the portable pump hook-up can be done quickly in the event needed.

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

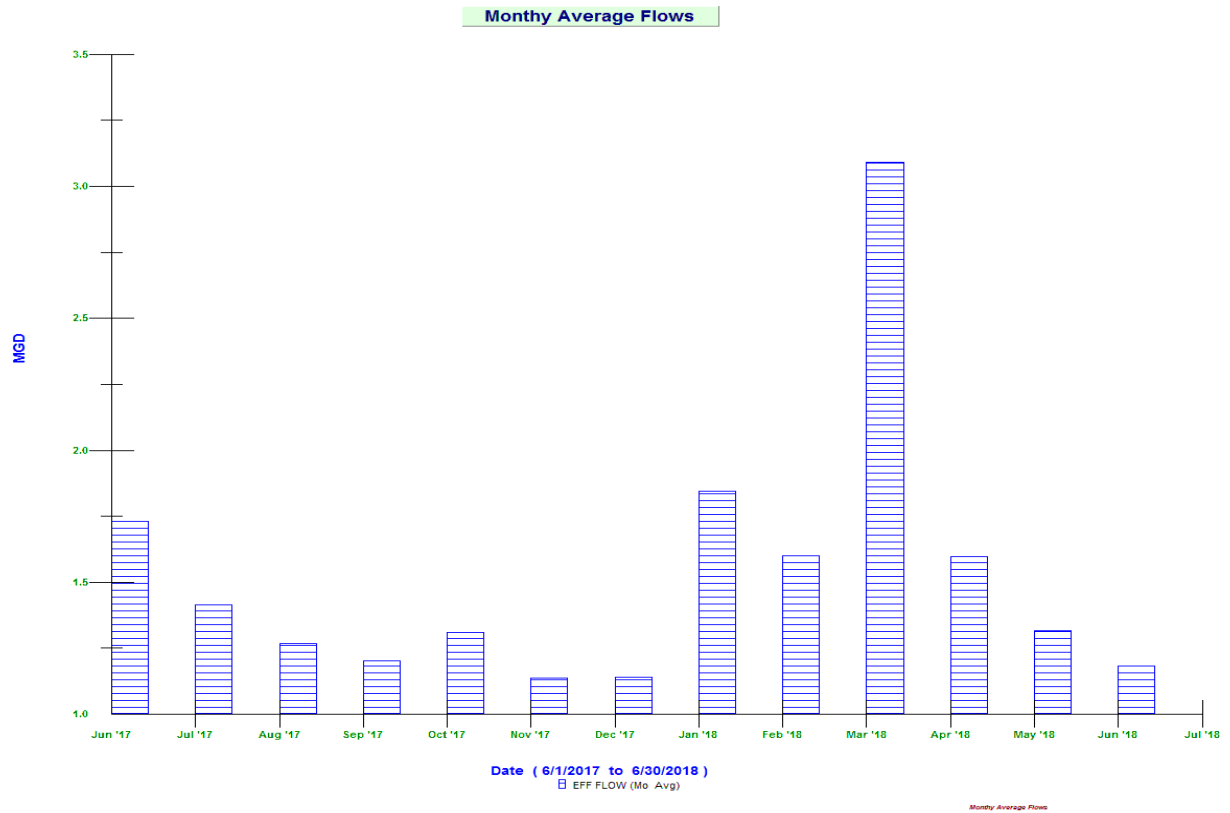
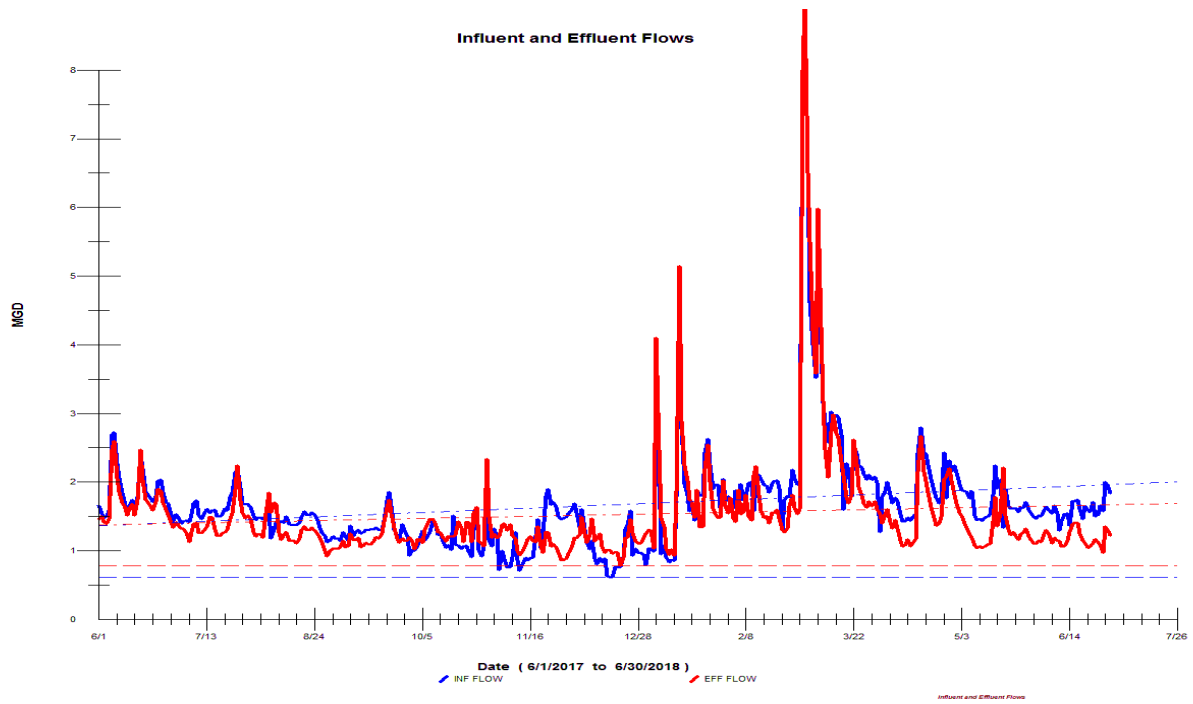


Average Daily Flows and Loadings for the Month:

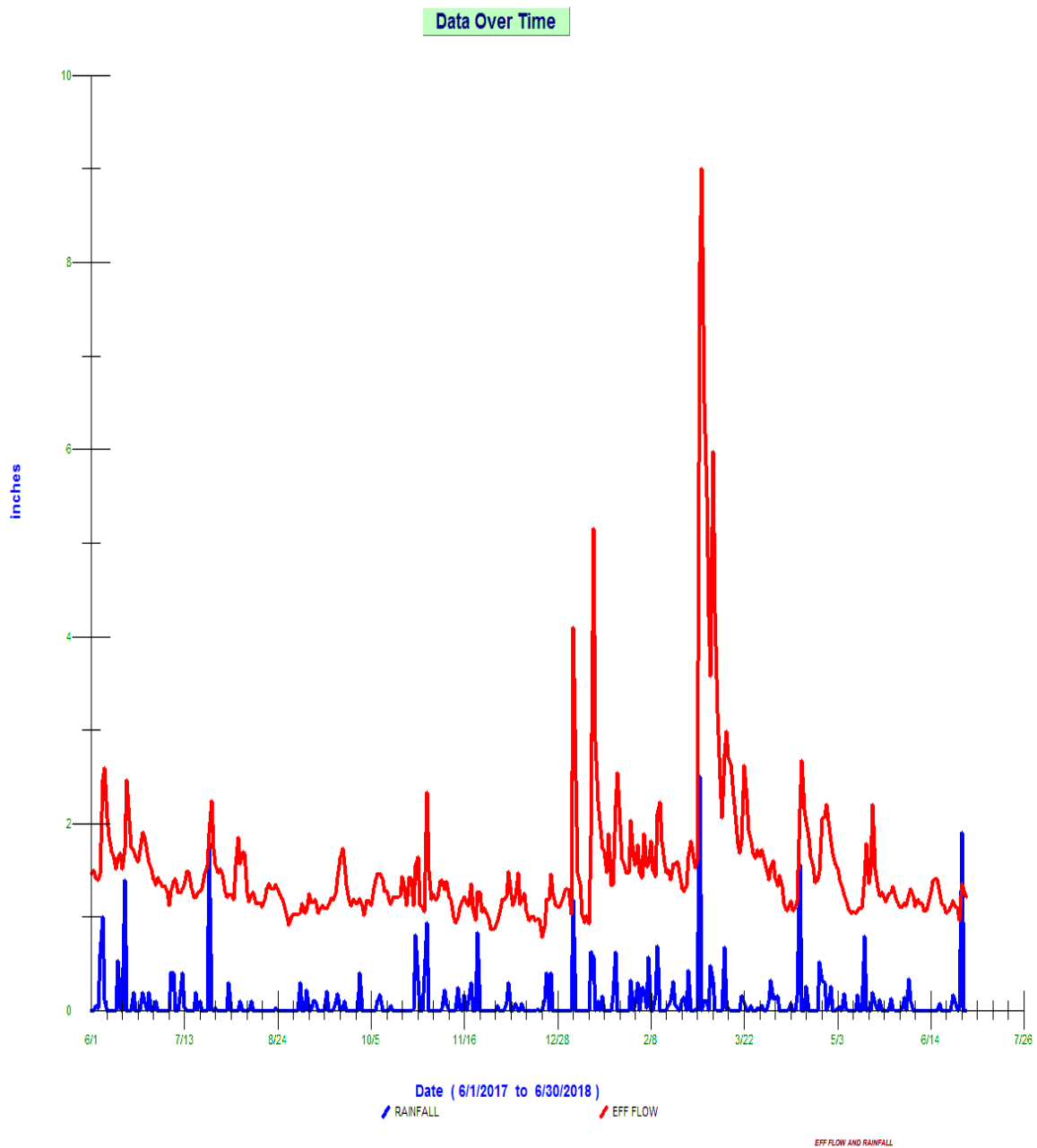
	Eff Flow MGD	Inf Flow MGD	Inf BOD LBS	Inf TSS LBS	Eff BOD LBS	EFF TSS LBS
June 2016	1.304	1.382 *	1767	3776	99	191
June 2017	1.731	1.842 *	2233	3183	188	320
June 2018	1.183	1.602 *	1084	1778	67	149

* Meter drift is getting closer and the numbers more accurate as the staff adjust accordingly.

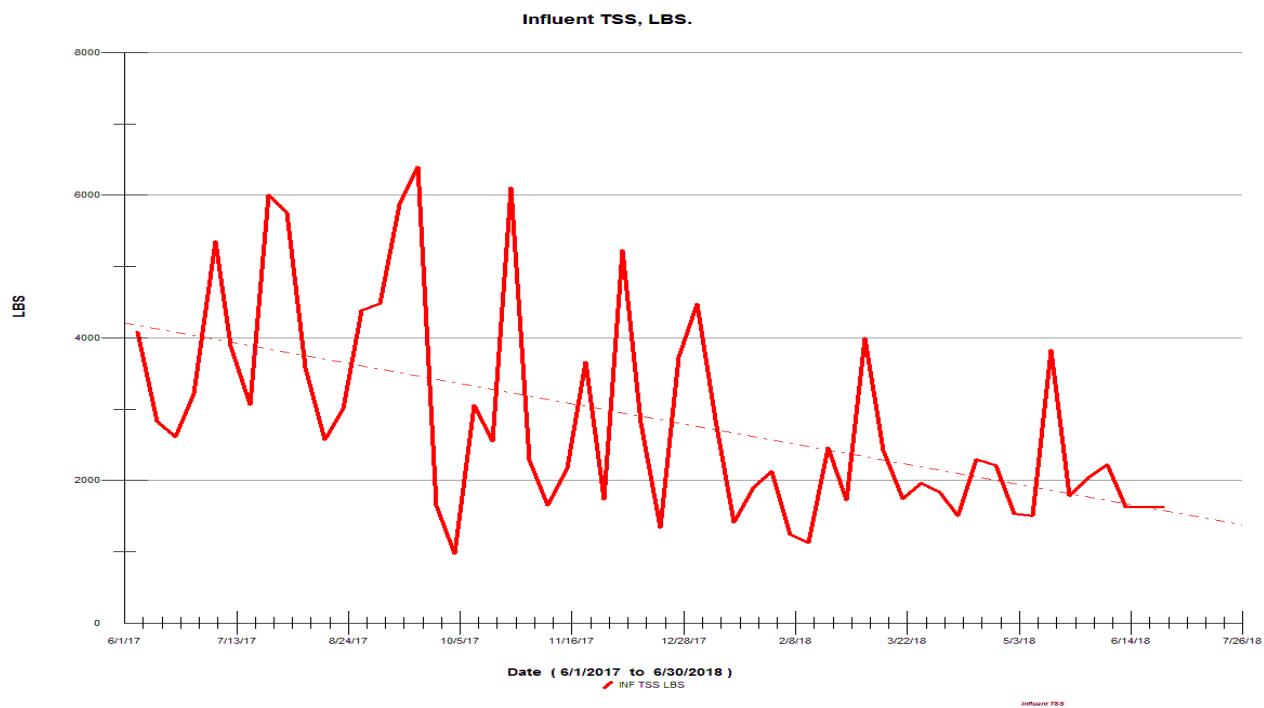
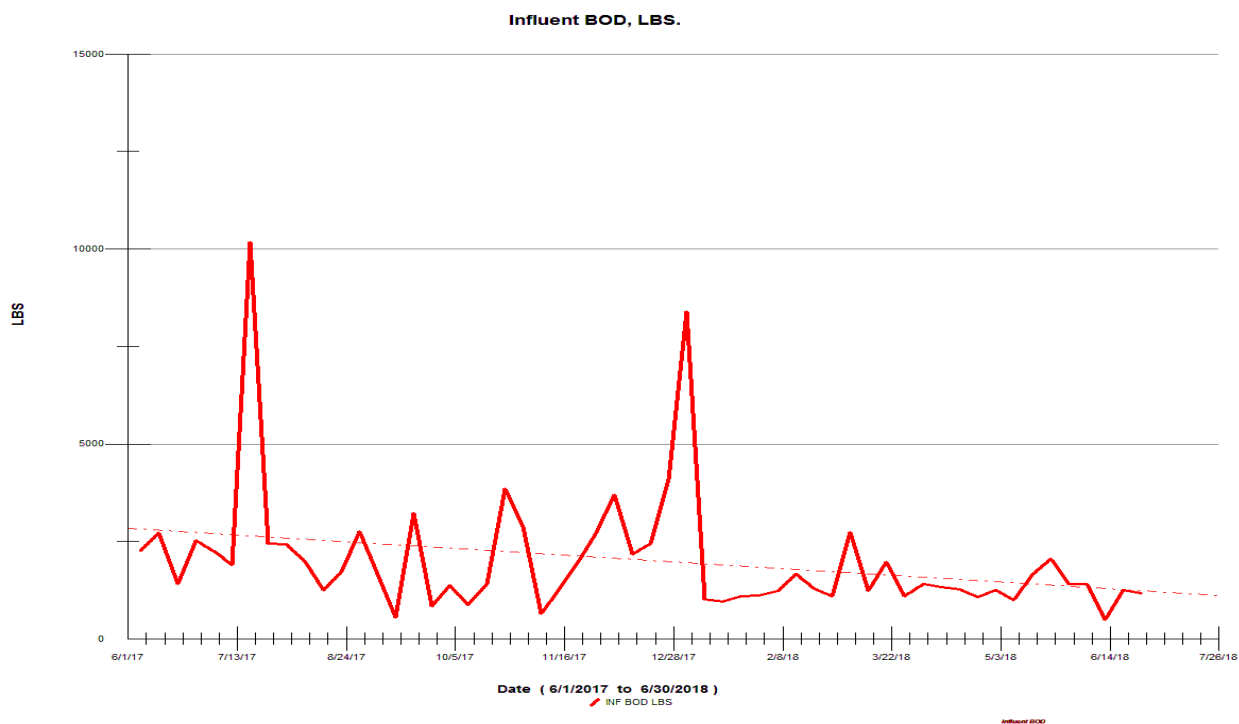
2.1 INFLUENT AND EFFLUENT FLOWS [PEAK FLOW]



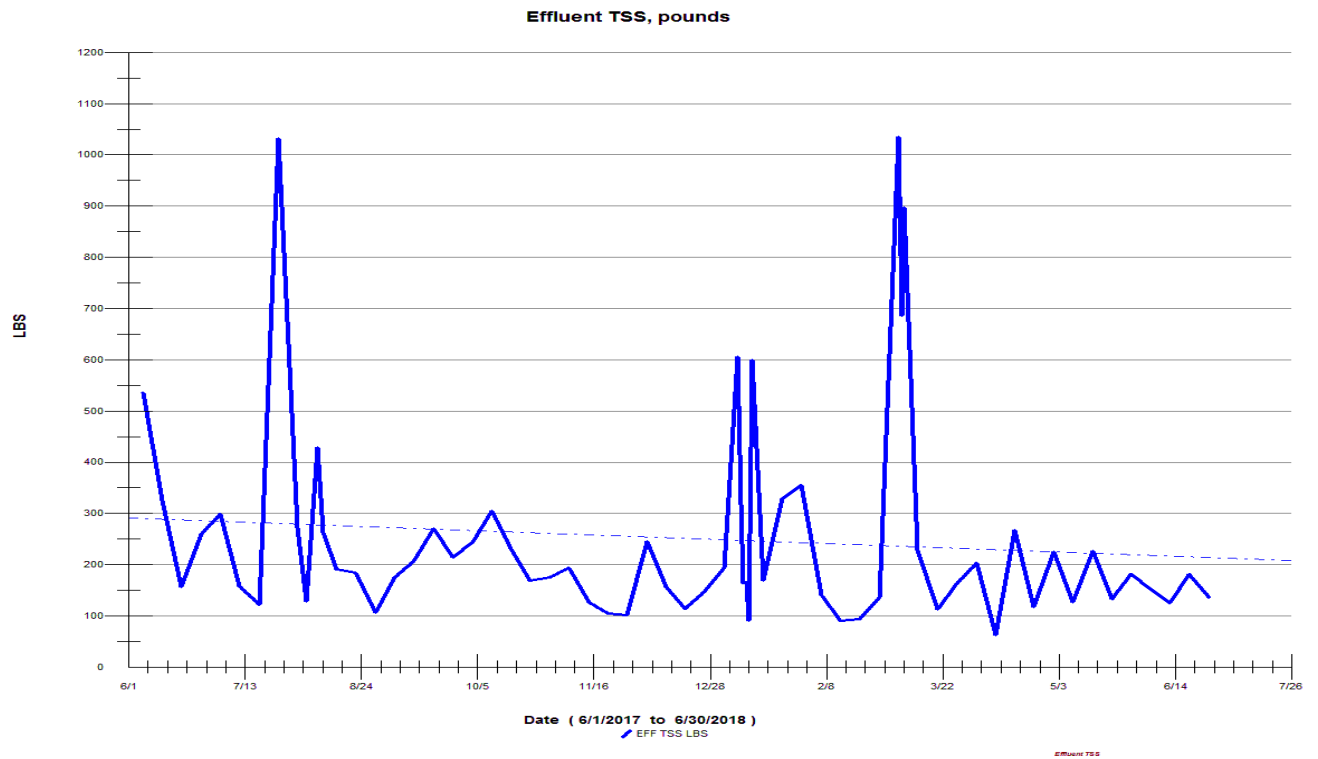
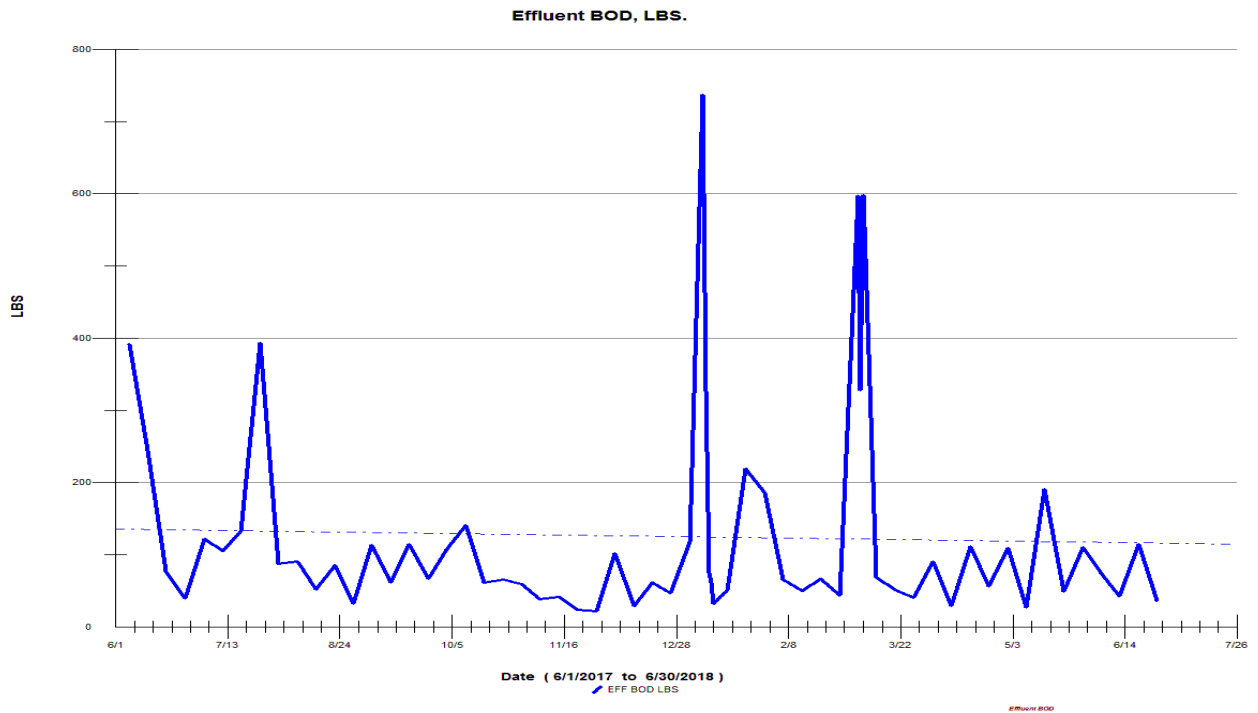
2.2 RAINFALL AND EFFLUENT FLOWS



2.3 INFLUENT BOD AND TSS LOADINGS



2.4 EFFLUENT BOD AND TSS LOADINGS LBS/DAY [MAX MONTHLY 768, MAX WEEKLY 1152]



3 COMPLIANCE



➤ Plant Effluent

- There were no exceedances for the month of June.
- Plant process conditions were good & showing improvement. Still working to control growth and reduce filamentous bacteria growth that creates a dark brown slimy foam and carryover to the secondary clarifier surface. The inefficient RAS removal from the secondary clarifiers continues to be a major contributing factor, however, the chlorination of the return activated sludge has been keeping things stable.
- The aeration system air diffuser had an air pipe break on 6/11/18 in aeration tank #1. The system is 15 years old and had little or no maintenance or inspection performed. Access to the tank had not been feasible, due to the inability to isolate the tank from service and adequate back-up aeration capacity. The failure in the air piping required some immediate repair plans to be undertaken to allow for work to be conducted in the tank. A temporary RAS bypass line hook-up was added in the secondary building so that RAS flow could be routed out to the aeration channel. This allowed for the #4 aeration tank and mechanical aerator #4 to be placed into service. The #1 aeration tank cleaning, hardware needs assessment and diffuser repairs were area of need and concern.
- A Copy of the NPDES report for June 2018 was submitted to the DEP and then forwarded to the Hull Sewer Dept.
- There was one [1] Sanitary System Overflows [SSO] reported during the month of June.
 - 42 Valley Beach Road – Lift station A. 6/12/18. Drain back valve broke while performing exercising operations for bypass connection system. Minimized spill by diverting sewage back to wet well. Contractor [Aqualine] repaired the next day.



Area by LS A after clean-up. 6/12/18



Area by LS A post drain line repairs

4 KEY PERFORMANCE INDICATORS



4.1 WATER QUALITY [JUNE]

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	15.5	14.0	19.0	4	0
Eff TSS	LBS			1152	768	1 X Week	148.8	124.9	182.2		0
% TSS Rem	%		85			1 X Month	91.6				
Eff BOD	MG/L	50		45	30	1 X Week	6.9	4.0	12.0	4	0
Eff BOD	LBS			1152	768	1 X Week	67.0	36.4	115.1		0
% BOD Rem	%		85			1 X Month	93.8				
Eff Chlorine	MG/L	1			0.7	3 X Day	0.09	0.01	0.42	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	7.2	6.9	7.5	30	0
Enterococci	#/100 ML	276			35	1 X Week	15	10	30	4	0

- There were 136 effluent samples taken in the month of June with zero [0] NPDES Permit exceedances.

4.2 GALLONS TREATED VS SLUDGE DISPOSED

Month	Effluent Treated, MG	Sludge Disposed, Gals
June 2016	39.11	90,000
June 2017	51.91	90000
June 2018	35.50	88000

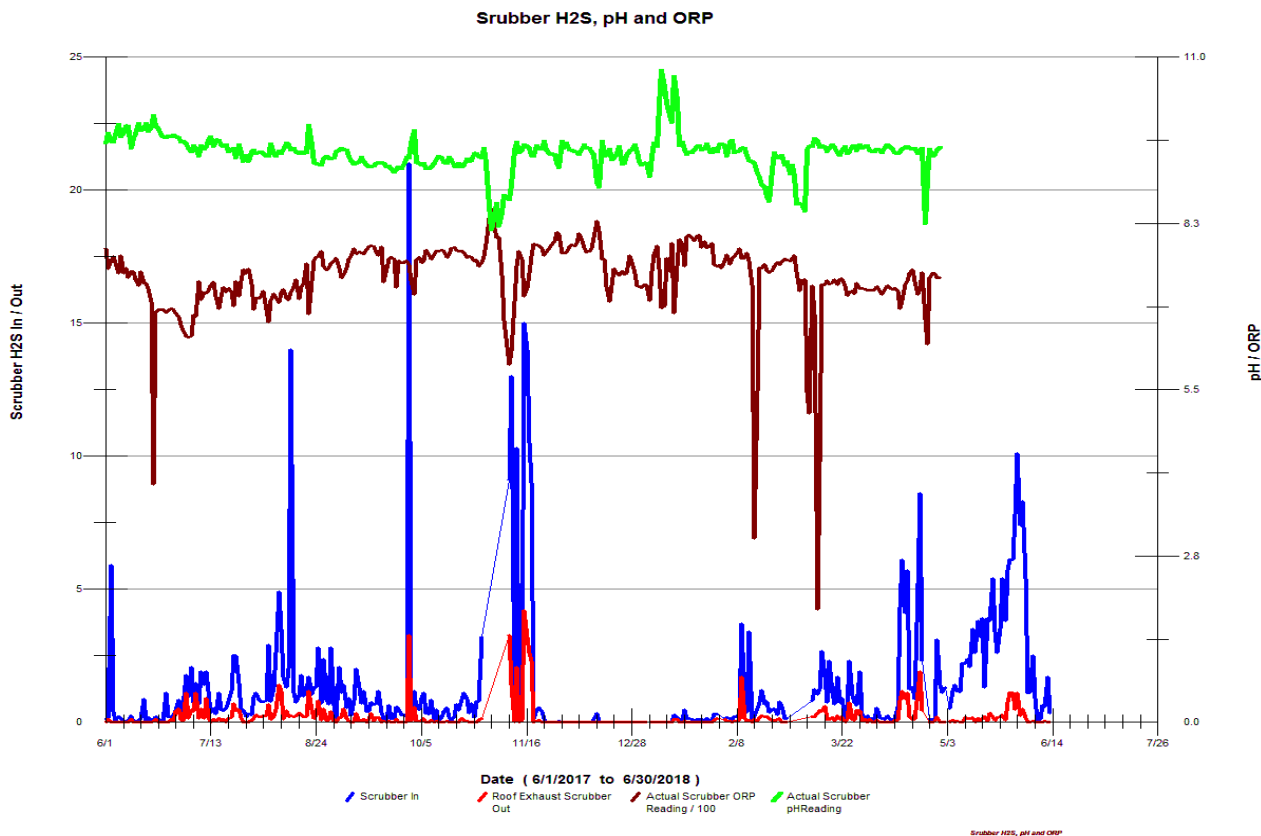
5 ODOR CONTROL

There were two odor complaints in June. These were a result of the required aeration tank cleaning [tank #1] in order to perform repairs to the aeration system piping. There was a large accumulation of sludge solids and grit that needed to be vactored out, and the off-gassing from the vacuum truck caused for odors in and around the plant. A “odor warning” letter was distributed to area residents before the work commenced.

The gravity thickener was still on line with no unusual odors and phased off line for the summer months. The primary clarifier was taken off line, and all influent sewage flow directed to the aeration tanks. The waste activated sludge was re-directed to sludge holding tank #2, via the blend box. Aeration tank troughs being flushed, to minimize build-up of odors.

Plant's Jerome H₂S portable meter failed, waiting for factory loaner. Limited odor readings reported on monthly June report.

The odor scrubber system was on line for the entire month. As noted last month, the recovery from the cleaning was fair, and media removal and replacement is being researched at this time. The system pH and ORP probes were checked and found to be ok.



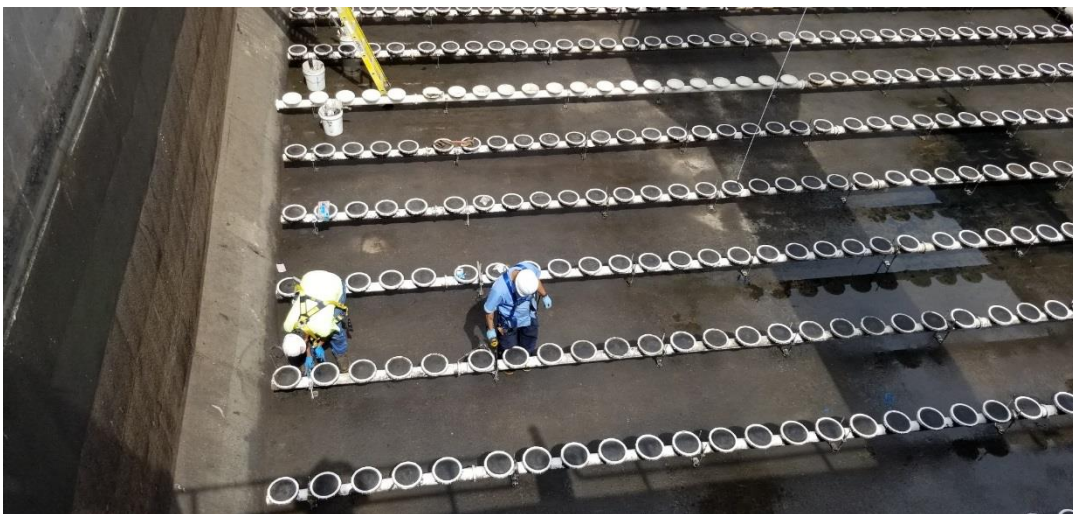
- “In-Pipe” bacteria addition continued with all 24 dosing stations operational. No additional actions taken for headworks sulfide reduction plan proposed by “In-Pipe. The June inspection/replacement with full bottles took place on 6/27/18.

- 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 plan is to reload twice per month, and this will deliver 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 will be monitored closely over the summer months, for pump stations and at the plant.
- On-going – frequent pumping of the secondary scum wells; taking tanks off line, when not needed and cleaning out.
- Evoqua [Bioxide] product was delivered in mid-June with pumping started on 6/15. Manhole H2S data-loggers set up at various manholes.
- Mixing systems/aerators all functional at the pump stations, except for pump station #3. New Medora Gridbee mixing system for PS 3 was received, but not installed yet.
- Still for consideration - Vetting of ideas/discuss options for headworks area to reduce corrosion and odors.
 - Rubber mats to cover all channels
 - Tarp with a constructed frame to cover the aerated grit chamber
 - New “ducting/pipes” to connect channels to scrubber ductwork – to pull air from the room into the channel and then into the scrubber – i.e., to not let odorous air into the room ... capture it in the channel and send directly into the scrubber – channel will be under a slightly negative air pressure
 - Possibly add hydroxyl radical ozone unit to air in above ground sludge tank ...
 - Seal all pipe penetrations entering/leaking the headworks
 - Remove all unused pipes
 - Possibly control/reduce air flow to the aerated grit chamber

6 MAINTENANCE SUMMARY



- Monthly work order summary for June compiled and a report summary can be found on page 24.
- Garage door enclosures to keep out rainwater constructed and installed by Jody St. George. [week of 6/13]
- Grit chamber cleaning completed, assisted by Wind River Environmental [WRE]. Still to evaluate grit pumps and grit system. Repairs made to the grit screw.
- WRE clean wetwells at PS 5 and PS6, and at plant primary scum well #2
- O2 sensor for HW area gas monitoring replaced.
- Hypo room – manifold leaks in various spots addressed. Re-tape fittings, replace tubing, valves, etc. Larger piping issues exist that will need to be addressed in near future.
- Aeration basin #1 repairs started, once tank cleaned out. Repairs to air distributor piping and diffuser piping supports needed. Additional hardware was needed from “Sanitaire” as all components that were “304 grade” stainless showing some degree of corrosion. Replace hardware where needed. W&C performing all in-tank repairs. Aeration tank #4 put on line with the mechanical aerator on 6/





Confined space equipment for permitted access into tank

- Aeration tank #1 tank cleaning [2-day] project. Assisted by John Hoadley [vac truck and support labor 6/21-22]; clean out tank debris [rags, grit, sludge]
- Emergency RAS line set up [Aqualine Utility 6/14] so that aeration system repairs could be made to aeration tank #1.



- RST repairs to guide wheels and drive chain.
- Aqualine Utility to plant on 6/28-6/28 to address broken 4-inch WAS pipe. Excavate outside by SC #2 and made the repairs and install additional isolation valve. Also found hole in the 6-inch WAS line to blend box. [install repair coupling].



- Install new mud valve on RAS line passing through aer tank #1. Inspect all RAS piping. We were able to close aeration tank drain valve by aeration tank #3 [in grass] to stop backflow of mixed liquor into aeration tank #1.
- On-going stair tread plates being replaced/re-secured where needed.
- Quarterly inspection and exercising of all valves at all pump stations. Install necessary fittings and hardware for bypass pumping hook-ups for all pump stations.
- Highland Power completed repairs to piping for Gen #1 heat exchangers. W&C staff test ATS #2 system, since Gen #1 off line for 2 days, due to heat exchanger piping work.
- BPV testing by Aquarion water done.

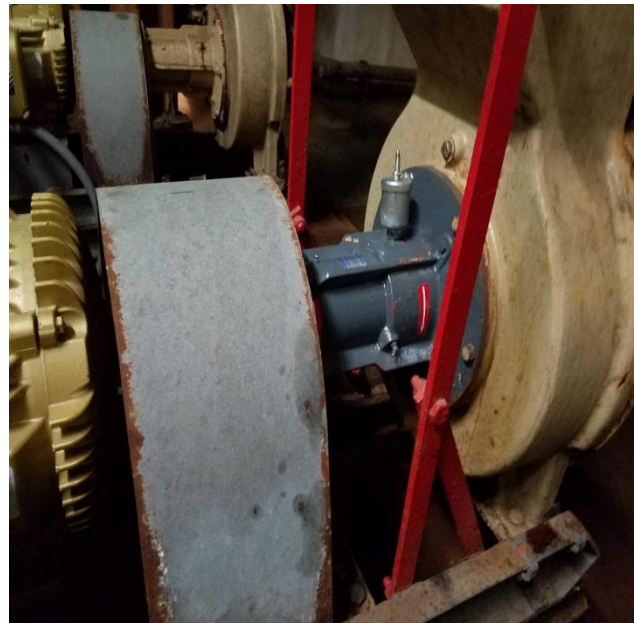
- The two major electrical events [5/16 & 5/19] that occurred in May still under review. No new incidents with the fluctuating 120-volt power load that feeds all of the programmable logic controllers [PLC's], and SCADA computers through plant back-up power supply units [UPS]. All UPS's replaced with new units.

On-going plant assistance from W&C SCADA Group, Boston Water & Sewer, Pioneer Electric, and EESCO. Power monitors are still in place. The 120-volt power loop is still being fed off of the HSD trailer after the second event on May

- Plant water basket strainer still investigating replacement units with same, or different unit. Also, where effluent water drawn into the system, size of suction piping, considering other suction location for system to improve water quality – utilizing water from effluent wet well versus drawing from bottom of a manhole just after the secondary clarifiers. Set up feed line to add hypochlorite to plant water system to improve water quality.
- Still On hold – needs further review - the sluice gate supports for the inlet gates to primary clarifiers at the D-box. As noted, the supports have lifted away from the concrete and there is also cracked concrete under the supports. Quotes for the repair will be solicited, once a repair plan is finalized.
- There were three grinder pump call outs during the month of June.
 - 11 Richards Road
 - 195 N. Truro
 - 35 Richards Road
- Finalized repair plan with Industrial Pump of RI for the repair of the sludge transfer pump. Able to return unnecessary items for full exchange. New pieces received and pump fully installed & operational.

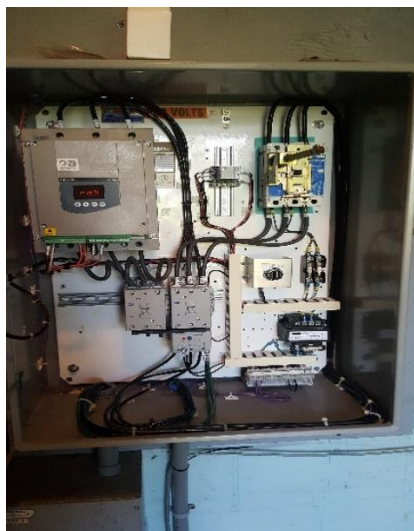


New volute and repaired rotating assembly



re-assembled/installed

- On-going Dig-Safe mark outs completed, due to emergencies, gas company work, 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.
- Pump Station 4 – Structural assessment calls for mid-level concrete work is necessary. Site safety area coordinator visited this station in March. The planned isolation valves replacement work still on hold. The structural issues at the station are currently being discussed due to complex scope and have delayed the work. The confined space work plan and JSA are in progress. Requesting quotes are on hold. Safety inspection of station mid-level floor/slab made to determine if temporary repairs possible.
- Purchase Order for plant generator heat exchanger cleaning/service planned, due to poor coolant water temperature drop with both generators. Highland Power to perform the requested services.
- Pump Station #1 – two visits in June to de-rag pumps at station. Internal pump condition assessed, and components are worn. Reviewed pump replacement options at PS 1, dry pit submersible vs what is there currently, since both pumps pumping at approximately less than 70% capacity when clean. Will recommend replacement of both pumps with same pump using ABBA replacement pumps, which is a direct replacement. [6-8-week delivery time after order placed. Soft starter for pump #2 replaced.



New soft start components



existing pump



existing pump

- Lost Pump Station communications on 6/23. Work with Verizon to resolve, but additional PS checks necessary since no alarms would come through. Checked stations every 8 hours over 24-hour period.
- Continue to look at RAS pump repair/replacement quotes for pumps #2 & #3.
- Working with HSD to identify MH structures in need of repairs, as a result of the winter storms and snow plowing. Priority list developed.
- On-going deragging of pump at PS 6. Looking at possible options for a “de-rag” control to plan for scheduled reverse rotation of the pumps to spin out accumulated debris. Working with vendor to get the specific details and costs.

- Highland Power attempted to clean the #1 generator [750 KW] unit on 5/31 ran into some unexpected issues. The support piping was very corroded, and pieces cracked during the disassembly. The heat exchangers were not removed due to excessive clogging, corrosion, and suspicion that the units could not be effectively cleaned. The heat exchangers were re-assembled and corroded supply piping replaced. Research into the replacement of these is underway.



Gen #1 internal blockage & corroded tubes



Corroded end cap of heat exchanger

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 June.
- Daily safety briefing meetings, review site safety policies with sub-contractors, safety tailgate topics.
- Safety Stand Down Meeting on 6/14/18 – Review of safe work practices involving quick disconnect fittings
- Safety Stand Down Meeting on 6/28/18 – Review of safe work practices involving incident reporting.
- Pure Safety – June – Fire Extinguisher Safety
- discuss "Incident Intervention Hotline contact number & recent email from H&S. Discuss the workflow chart, what to do if an incident occurs, who to call, etc. Work abilities form.
- Monthly staff safety meeting conducted on 6/29/18
 - Job Aid/tailgate discussion on fire safety and prevention
 - Tool box topic – Lawn mowing essentials
- May 2018 Lessons learned discussed – Near misses and incidents from other company projects

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:

- 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 May discussed.
- Qualified Electrical Refresher training for Aram V.
- New hire on-boarding training for Mike Anderson – Mass Maritime intern.
- Bill B and Cody P – first aid/CPR training [W&C] on 6/21
- Cody P – on-going training in various areas – plant rounds, station checks, review of various SOP’s.

Staffing related items:

- New summer intern selected from MA Maritime, Hull resident Michael Anderson’s internship started in mid-June [6/17].
- Continue involvement with Mass Maritime internship program/career fair for future interns. Screening possible candidates for fall and winter 2018-2019.
- Sunday rotation schedule in place for next several months through early September with Jim Gagliard working every other Sunday, and remaining weekends being filled by Roger B., and Bill B. When Bill is not scheduled for a Sunday, he will be on a Monday-Friday schedule.

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	*!		
June, 2018					X	X		
July, 2018								
Aug., 2018								
Sept. 2018								
Oct., 2018								
Nov, 2018								
Dec., 2018								
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**

10 PROJECT MANAGEMENT & ADMINISTRATION



10.1 ON-GOING PROJECTS AND SUPPORT ITEMS

- On-going - Asset management checkbook for tracking of expenses. Review of account status between W&C and Hull Sewer Dept. is on-going. Closing out of year #3 [03M] and working currently on year #4 [04M].
- HFMP - no additional updates. Heavy rain showers on 6/28 – D Street pump trash pump run as needed. Monitor elevated plant flows and adjust influent and effluent pumps as needed.
- All station wetwells inspected in June. High level alarms for wetwells checked.
- Update and final review of this past winter's additional storm related costs [03Z] & presented to HSD.
- On-going UST/AST work.
 - a) Review of wave analysis for future fuel tank design
 - b) Review design flood elevation discuss needed borings/cores
 - c) Planning upcoming work for the UST removal
 - d) Review structural drawings for planned AST, design co-ordination/design scope options for the future fuel tank
- Deragger – still evaluating software program that would allow for automatic reversal of pump rotation to spin out accumulated rags and debris to minimize the need to shut down a pump so that cleaning can be performed. Possible use at PS 3 and PS 6.
- Still to be done: set up co-ordination meetings with WINDRIVER, National Water Main, and other collection system vendors - to review our Contract Collection System Quota work, upcoming projects.

- YSI process sensors: nothing further done on possible use in facility. ORP, pH, DO & other for areas for possible use.
- Considering a pilot test of Drylet's Aqua Assist product which is used extensively for reducing solids levels in wastewater treatment process systems, and enhancement of secondary effluent. Reviewing proposals for options, either a subscription based or performance-based.
- W&C Scada working on upgraded control system with DC powered back-up system for the influent and effluent back-up systems that would not rely on AC power in the event of plant power loss of 120-volt AC power.
- Operations building control room – mini-split AC unit was replaced [approved by HSD]; other smaller units in offices need replacement. Bigger needs – HVAC system upgrade plan for building, moving forward with upgrade initially prepared by Tighe & Bond.
- Plant fluorescent lighting is of concern. Many of the ops building fixtures have issues with corroded ballasts and light bulb connectors. Will reach out to the state approved contractors providing energy efficient lighting solutions for fixture upgrade/replacement.
- On-going work with Horizon Energy Solutions on the energy grant proposals in various areas: Block heater for the #1 generator, air blower piping for grit chamber and sludge holding tank [tie into larger supply piping and blowers], HVAC options for Ops building.
- Utility Cloud planning and implementation moving along. Received new tablets [IPads]. Andy Crawford, Peter Lyons & Alan Fabiano leading the effort and areas being considered for initial use
 - a. MH Inspections - doFORMS Replacement: NASCO and Generic Inspection forms are available right now.
 - b. In-Pipe Bacteria Unit Inspections - doFORMS replacement: Yes or no questions for: Unit Changed Out? Installed Unit? Inoculated? Unit Status (Failed/Running)?
 - c. Grinder Pump Alarms - doFORMS replacement is available: Grinder Pump Replaced (Yes/no), Serial #in, Serial #out
 - d. Backup / Blockage & Mark outs - Could easily create a new workflow to start
- Peter Lyons working on MADEP mapping grant and application and ARC-GIS. Gunrock area camera work.
- CZM resiliency grant application made in late May. Waiting for award results for funding at 50% - The Town of Hull's WPCF Electrical Service Relocation project would relocate the Water Pollution Control Facility's existing electrical service line and ground surface pad mounted transformer
- On-going electrical support for plant electrical issues related to the 120-volt circuits [see MAINT section]; Sonic wall [firewall] protection for plant SCADA system upgraded by W&C SCADA group.

11 WORK ORDER SUMMARY

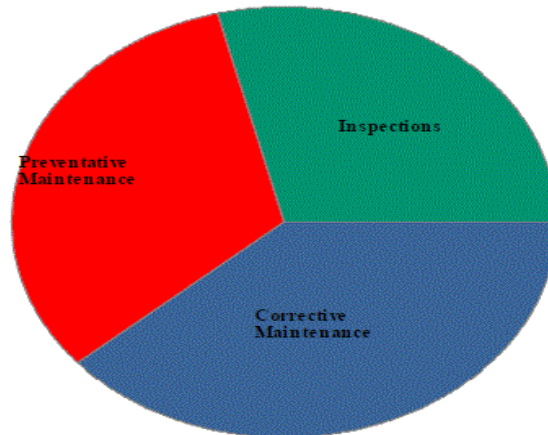


Maintenance History Report Hull Wastewater

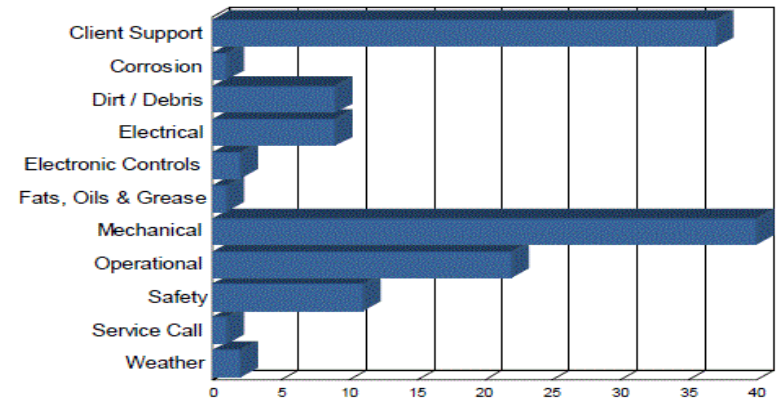
Start Date: 6/1/2018
End Date: 6/30/2018

Corrective Maintenance	52
Inspections	39
Preventative Maintenance	44
Total Work Orders	135

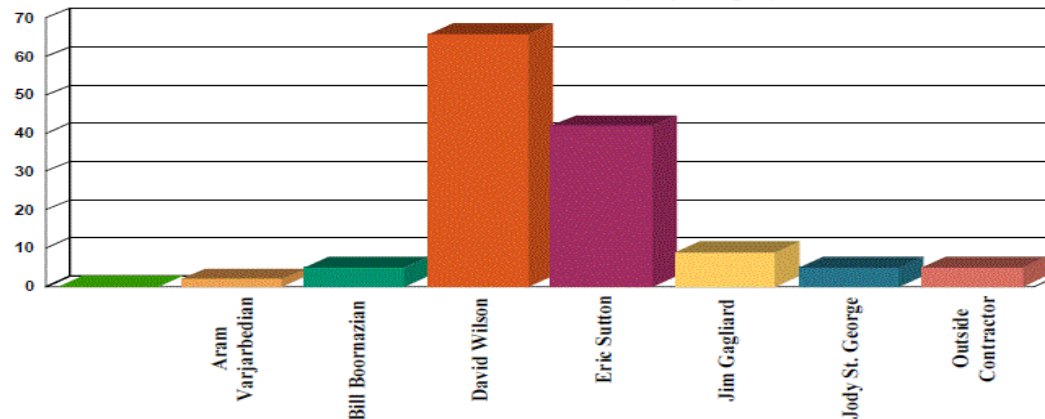
Work Order History By Type



Work Order History by Reason



Work Order History By Employee



Employee	WO Count	Labor Hours
Aram Varjarbedian	2	3
Bill Boornazian	5	13
David Wilson	66	75
Eric Sutton	42	34
Jim Gagliard	9	8
Jody St. George	5	21
Outside Contractor	5	23
Unassigned	1	3
Totals	135	180