

LEWES WASTEWATER TREATMENT PLANT

Influent Flow Report

Influent Flow

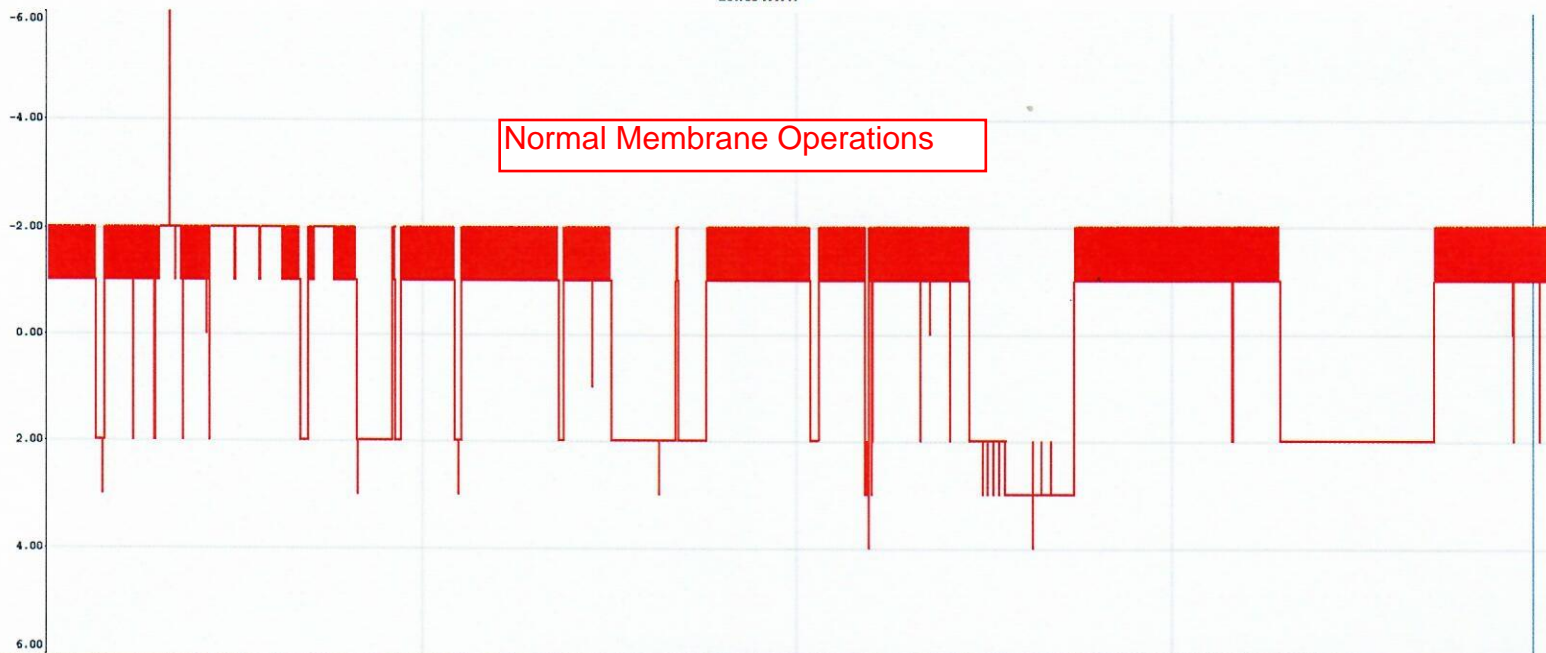
Time	Flow	
9/1/2020	667500	
9/2/2020	821300	
9/3/2020	1045500	
9/4/2020	1692100	Peak Day
9/5/2020	1229400	
9/6/2020	1147300	
9/7/2020	1067900	
9/8/2020	955300	
9/9/2020	889700	
9/10/2020	908900	
9/11/2020	912200	
9/12/2020	902600	
9/13/2020	890300	
9/14/2020	830200	
9/15/2020	775400	
9/16/2020	727400	
9/17/2020	751000	
9/18/2020	816400	
9/19/2020	787600	
9/20/2020	822100	
9/21/2020	790800	
9/22/2020	772300	
9/23/2020	773000	
9/24/2020	766000	
9/25/2020	387000	
9/26/2020	800700	
9/27/2020	801700	
9/28/2020	787300	
9/29/2020	798400	
9/30/2020	907200	
Total Flow :	26224500	

LEWES WASTEWATER TREATMENT PLANT

Effluent Flow Report

Effluent Flow

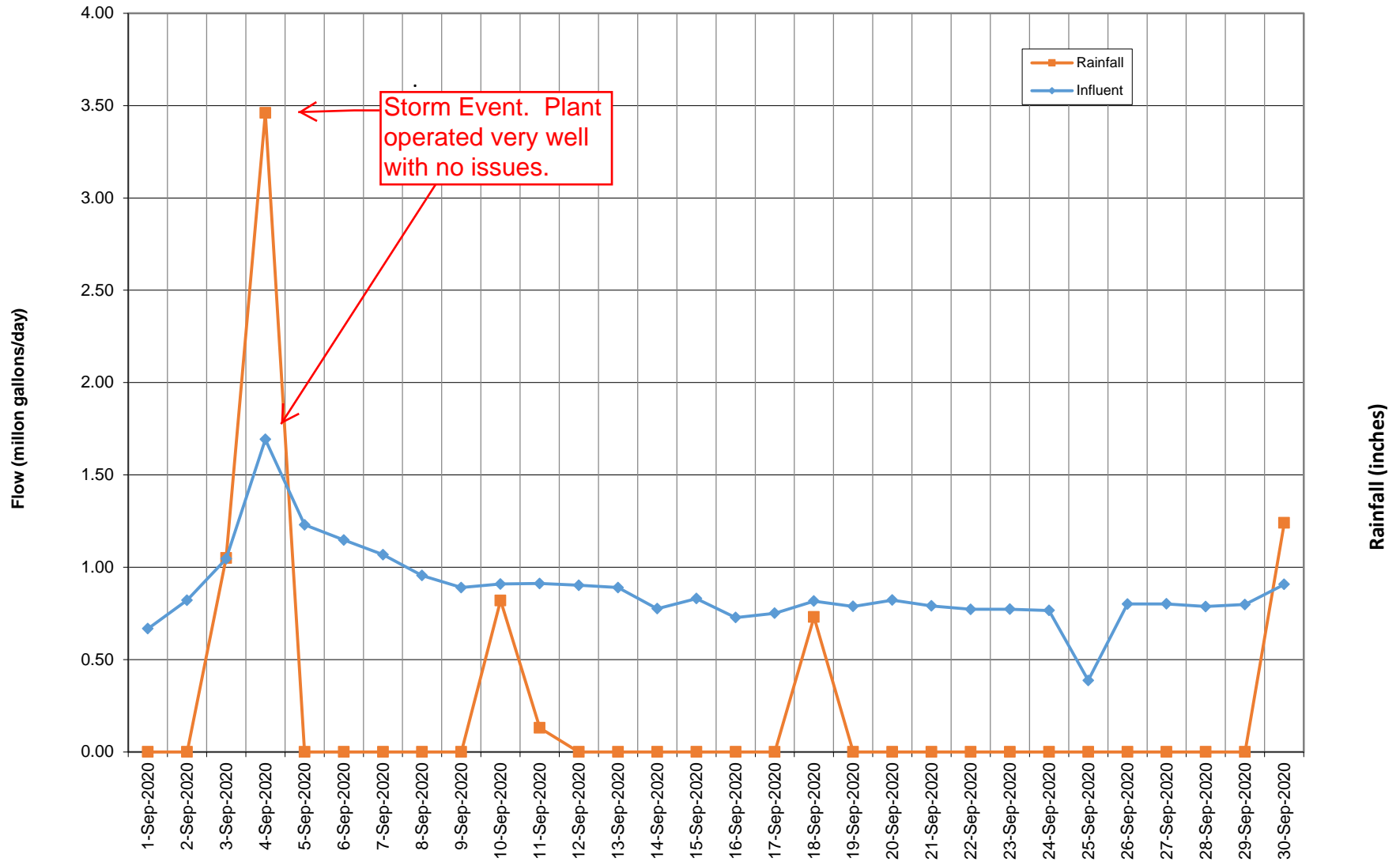
Time	Flow
9/1/2020	603700
9/2/2020	796500
9/3/2020	924900
9/4/2020	1600400 Peak Day
9/5/2020	1178000
9/6/2020	1129200
9/7/2020	1095400
9/8/2020	967500
9/9/2020	889100
9/10/2020	938100
9/11/2020	894200
9/12/2020	900800
9/13/2020	886000
9/14/2020	841300
9/15/2020	777100
9/16/2020	741100
9/17/2020	771700
9/18/2020	806500
9/19/2020	791400
9/20/2020	817600
9/21/2020	788100
9/22/2020	768500
9/23/2020	769700
9/24/2020	760200
9/25/2020	771800
9/26/2020	800500
9/27/2020	804200
9/28/2020	780000
9/29/2020	818200
9/30/2020	897500
Total Flow :	26309200



Label	Curr...	Cursor
Transmembrane PSI	-2.30	-2.00

Kubota Digester Membranes

Influent Flow Vs. Rainfall



LEWES BPW WWTP Biweekly InSight Report

Date: 9/9/2020

From: Erin Horocholyn - Suez Water Technologies & Solutions
To: Dave Weed, Darrin Gordon
cc: Matt Stapleford - Suez Water Technologies & Solutions

System Equipment

4 × ZW trains, each train consists of 4 - 500D cassettes, 120 modules x 370 sq. ft. per train (surface area 44,400 sq. ft. per train)

Replacement membranes installed Q1 2020 on all 4 trains

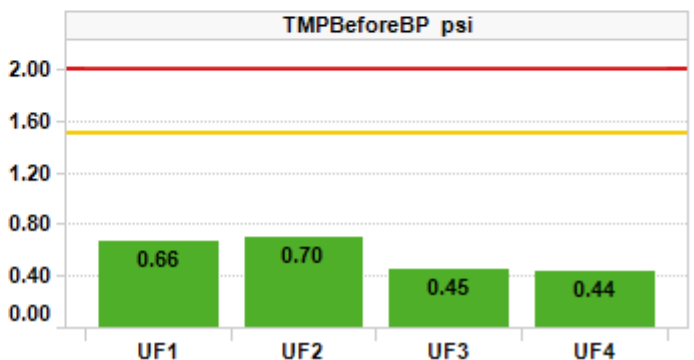
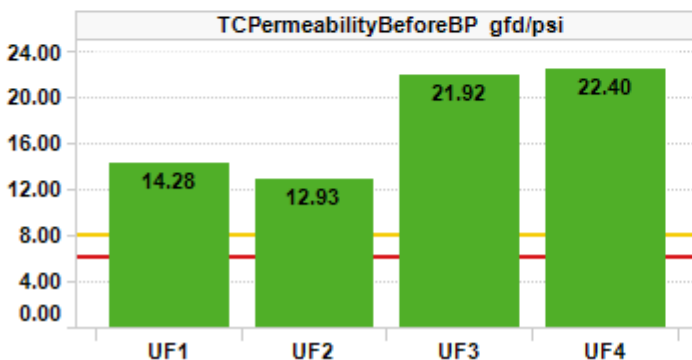
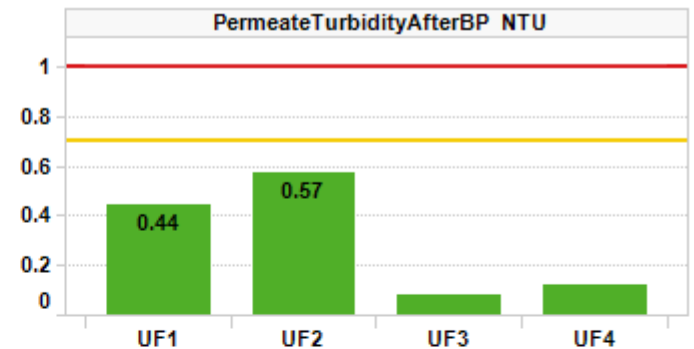
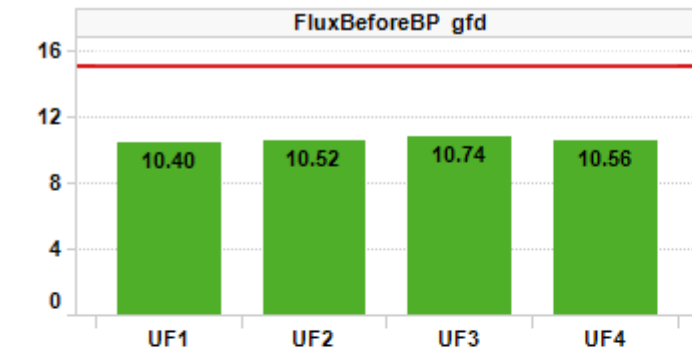
Cleaning Strategy

Recovery cleaning - 2 NaOCl @ 2000 ppm dose/1000 ppm soak per year, 1 Citric acid @ 2000 ppm per year

Maintenance cleaning - 1 NaOCl per week @ 200 ppm, 1 Citric acid per week @ 2000 ppm

KPI Dashboard – Avg values through reporting period

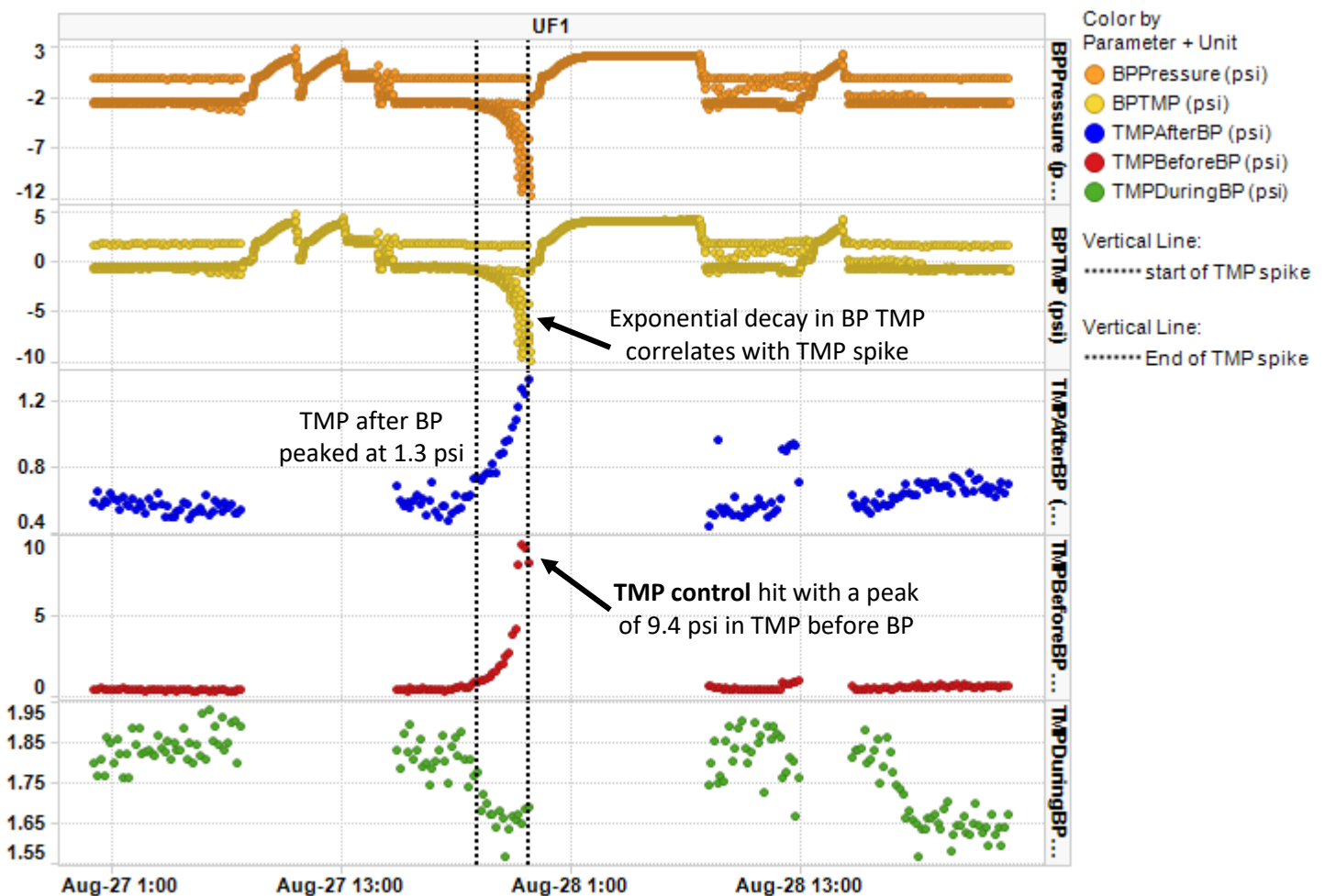
■ Action Required
■ Caution
■ No Limits
■ Normal



Plant Summary

Overall, the plant operated well. Turbidity has decreased on UF2, but rose on UF1. As well, there are no citric acid maintenance cleans (MCs) showing in the data to date. **If no citric MCs are currently being run, I recommend replacing one of the weekly hypochlorite MCs with a citric acid MC. Finally, unless there are production constraints, I recommend running the MCs for 1 hour or 45 mins instead of 30 mins.**

- TC permeability BBP was good on all trains, and excellent on trains UF3 and UF4. UF1 and UF2 averaged 14.28 and 12.93 gfd/psi respectively. UF3 and UF4 averaged 21.92 and 22.40 respectively. For reference, TC permeability BBP is considered good above 8 gfd/psi
- Average TMP was great on all trains. UF1 and UF2 averaged 0.66 and 0.70 psi, while UF3 and UF4 averaged 0.45 and 0.44 psi. For reference, excellent TMP is below 1.0 psi
 - All trains had higher TMP around 1.0 – 1.2 psi on Sept 4th, due to the high flow event. TMP levels have been slightly elevated since the flow returned to normal on all trains
 - UF1 experienced high TMP on Aug 27th, seeing a peak in the before BP TMP of 9.4 psi, which is at TMP control. At this time, UF1's permeability was suppressed to levels as low as 0.73 gfd/psi. The exponential decay in BP TMP correlates to the TMP spike; BP TMP is calculated with BP Pressure which shows the same trend. No spikes were seen in flux or any aeration tags, and no spikes were seen on the other trains at this time. The backpulse pressure transmitter is PE/PIT-3523-1 which is on the permeate header before the process pump P-35-1. The BP TMP is tag PDI-8823-1, and is calculated from PDI-3423-1. The TMP control issue cleared up after the event



- Permeate turbidity was above 0.10 NTU on UF1, UF2, and UF4, averaging 0.44, 0.57, and 0.12 respectively. UF3 averaged 0.08 NTU. For reference, excellent turbidity is less than 0.1 NTU, and good turbidity less than approximately 0.3 NTU
- Average daily permeate production was 841 kgal, with a maximum of 1800 kgal (1.8 MGD) on Sept 4th. Average daily production per train was 219 kgal on UF1, 263 kgal on UF2, 179 kgal on UF3, and 181 kgal on UF4. Currently UF2 is producing the most permeate, followed by UF1
- Flux ranged from 10.40 – 10.74 gfd, and is more even across trains in this period compared to the last report. Even flux is beneficial for even wear across the membrane trains
- Maintenance clean design specifies 1 hypochlorite/chlorine MC and 1 citric acid MC per week, per train. MCs last about 66 minutes, or just over one hour at the default duration setpoints/iterations. Design pH for hypochlorite MCs is maximum 10.5, and for citric acid MCs the ideal range is 2.5 – 3.5.
 - There is some variation in MC duration on UF1. The average duration of 0.5 hours is less than the default design MC duration of about 1 hour, which may be limiting MC effectiveness
 - There are no acid MCs showing up in the data – **can the site confirm if citric acid MCs are scheduled?**
 - There are currently about 2 hypochlorite MCs being run per week, per train, which is double the design requirements. **If no citric MCs are currently being run, I recommend replacing one of the weekly hypochlorite MCs with a citric acid MC**

Asset	Date and Start Time	Chemical Used	MC Duration (hours)	CIP BP Tank average pH
UF1	Aug 27, 7:51 AM	Chlorine	2.5	7.6
	Aug 27, 3:11 PM	Chlorine	0.5	7.7
	Aug 28, 1:05 PM	Chlorine	1.0	7.8
	Aug 31, 8:02 AM	Chlorine	2.0	7.6
	Sept 3, 8:07 AM	Chlorine	0.5	7.7
	Sept 8, 1:30 PM	Chlorine	0.5	7.5
UF2	Aug 28, 7:53 AM	Chlorine	0.5	7.7
	Sept 1, 8:08 AM	Chlorine	0.5	7.7
	Sept 5, 10:34 AM	Chlorine	0.5	7.5
	Sept 8, 8:08 AM	Chlorine	0.5	7.5
UF3	Aug 28, 8:50 AM	Chlorine	0.5	7.6
	Sept 1, 9:30 AM	Chlorine	0.5	7.7
	Sept 5, 11:24 AM	Chlorine	0.5	7.5
	Sept 8, 9:36 AM	Chlorine	0.5	7.6
UF4	Aug 27, 10:37 AM	Chlorine	0.5	7.6
	Aug 31, 11:06 AM	Chlorine	0.5	7.3
	Sept 3, 9:28 AM	Chlorine	0.5	7.7
	Sept 8, 11:45 AM	Chlorine	0.5	7.5

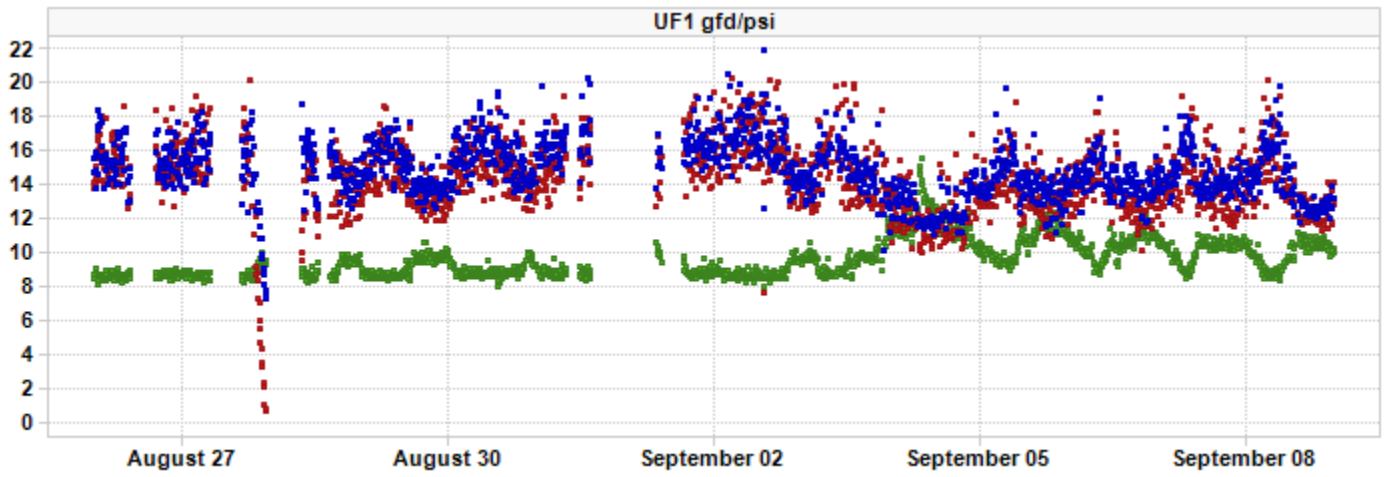
This has been adopted per recommendation.

Acronyms:

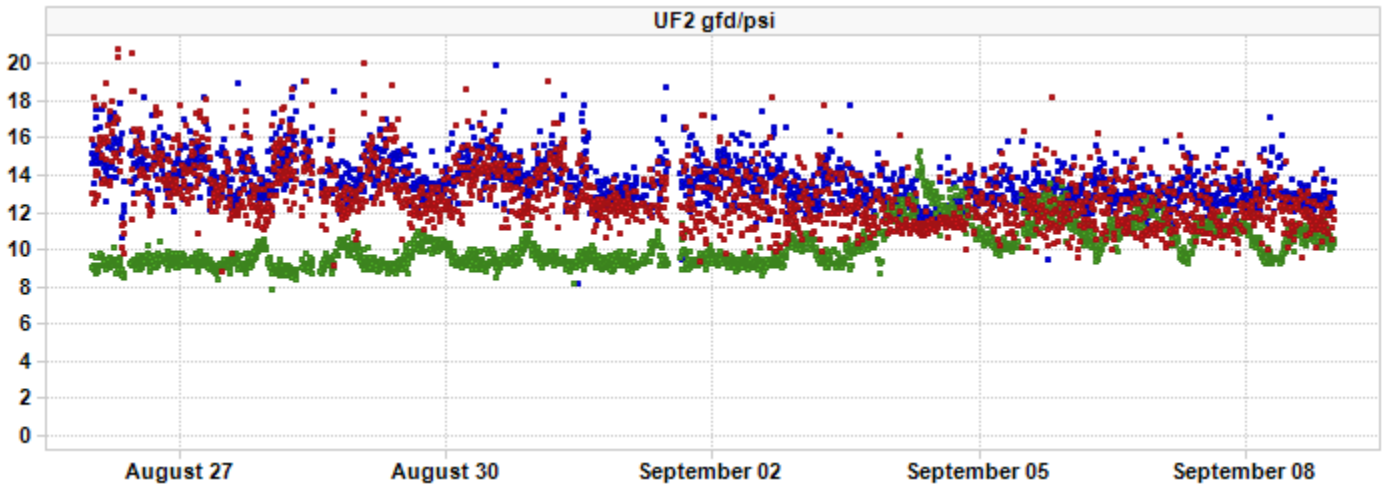
TC = temperature corrected, BBP = before backpulse, RC = recovery clean, MC = maintenance clean, TMP = trans membrane pressure

TC Permeability Trends By Train

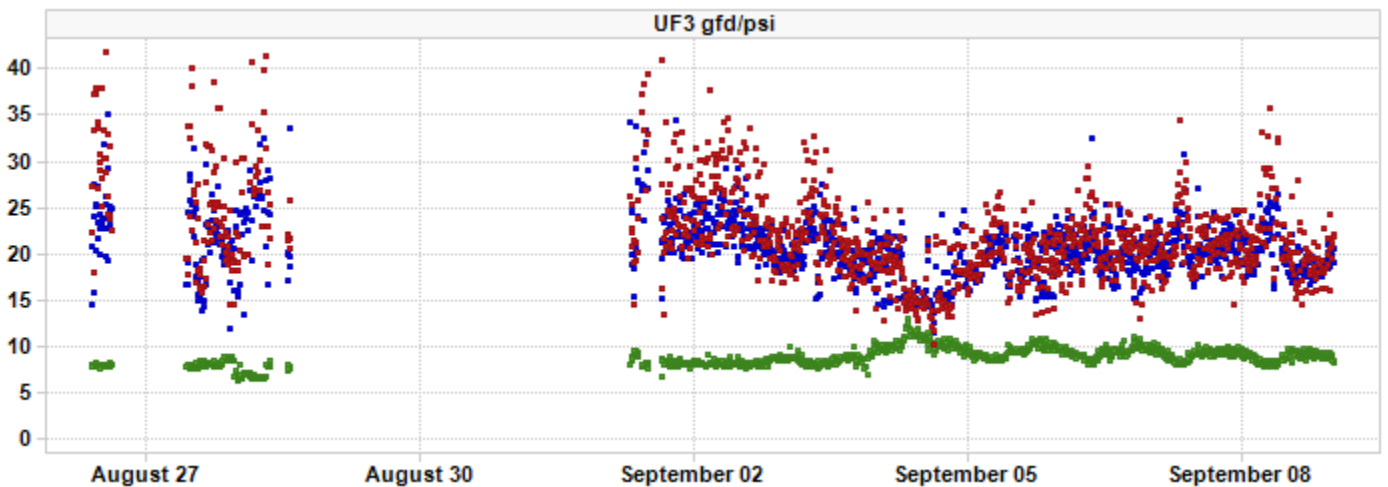
■ TCPermeabilityAfterBP
■ TCPermeabilityBeforeBP
■ TCPermeabilityDuringBP

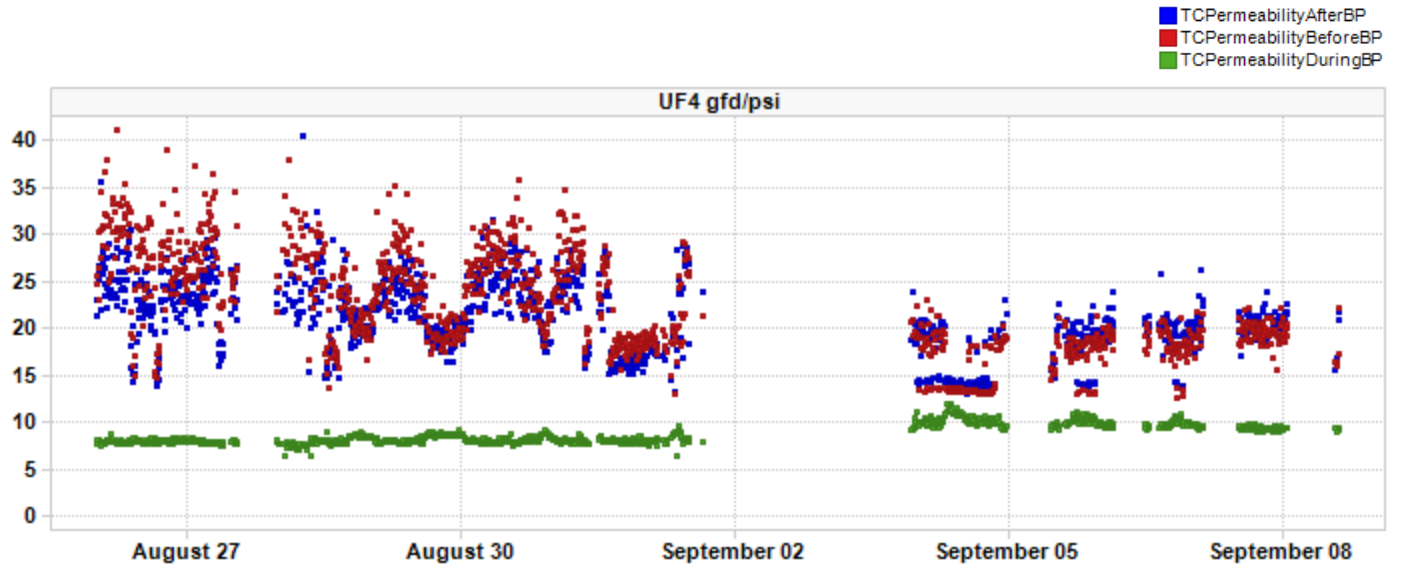


■ TCPermeabilityAfterBP
■ TCPermeabilityBeforeBP
■ TCPermeabilityDuringBP

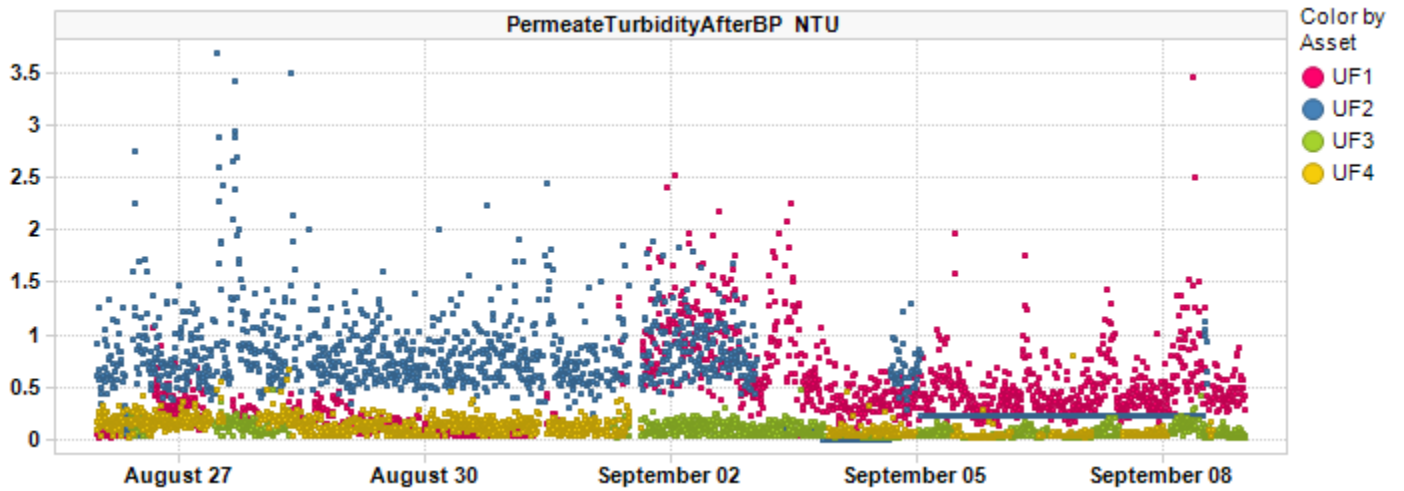


■ TCPermeabilityAfterBP
■ TCPermeabilityBeforeBP
■ TCPermeabilityDuringBP

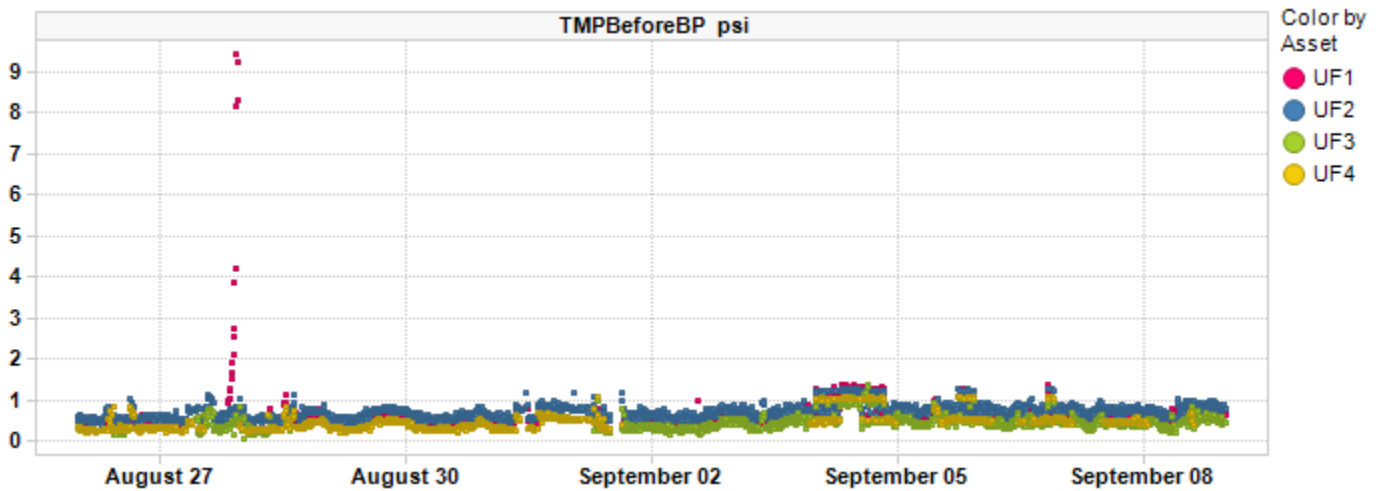




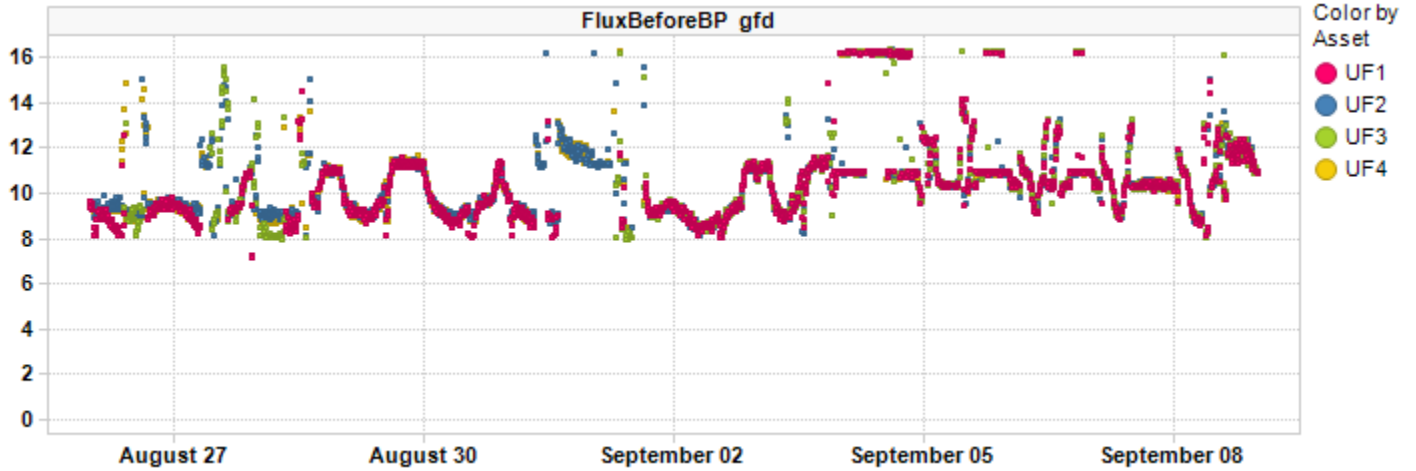
Permeate Turbidity Trend



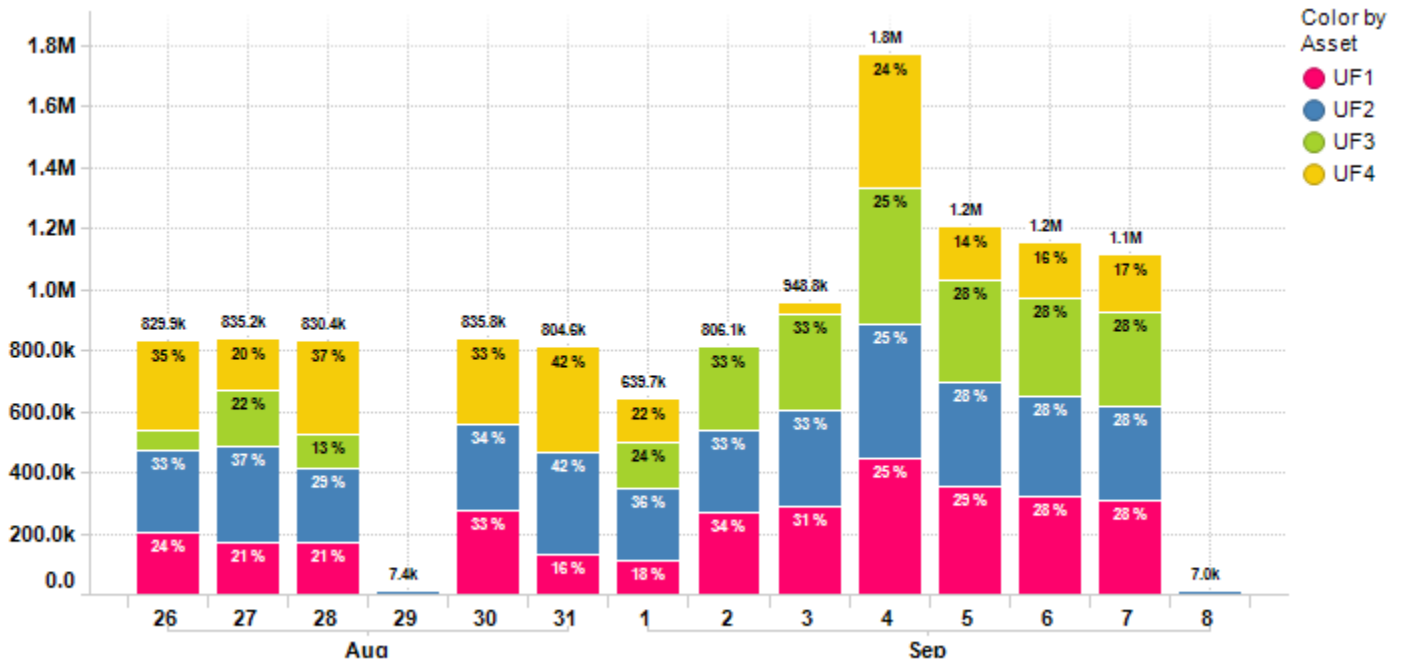
Before BPTMP Trend



Before BP Flux Trend



Daily Permeate Flow



Average Daily permeate flow from 8/26/2020 to 9/8/2020 is 841.2k gal with a maximum daily flow of 1.8M gal.

Asset Summary

KPI Parameters	Value/Change	UF1	UF2	UF3	UF4
FluxBeforeBP gfd	Value	10.40	10.52	10.74	10.56
	Change	5.10 %	4.17 %	-8.19 %	5.10 %
FluxDuringBP gfd	Value	18.84	18.53	18.58	18.77
	Change	0.06 %	-0.03 %	-0.63 %	0.08 %
PermeateTurbidityAfterBP NTU	Value	0.44	0.57	0.08	0.12
	Change	77.08 %	-21.19 %	-106.72 %	-21.24 %
TCPermeabilityBeforeBP gfd/psi	Value	14.28	12.93	21.92	22.40
	Change	-1.66 %	-7.79 %	-4.53 %	-9.85 %
TMPBeforeBP psi	Value	0.66	0.70	0.45	0.44
	Change	11.69 %	11.70 %	-12.79 %	17.63 %
TotalPermeateFlowDaily gal	Value	218.77k	262.98k	178.93k	180.51k
	Change	99.30 %	99.46 %	100.00 %	98.51 %

Plant Summary

KPI Parameters	Value/Change	UF Plant
TotalPermeateFlowDaily gal	Value	926.32k
	Change	99.54 %

Contract Expiry Date : (Empty)

For InSight technical assistance please email insight.src@suez.com or please call technical support at 1 866 271 5425 or 905 469 7723 and follow the prompts, if you require after hours assistance please contact the 24/7 Emergency number provided in your plant documentation. This email is a summary of issues identified during a manual review of InSight data from the time period above. This review is an analysis of data that is logged by InSight and identifies key plant performance issues determined from this data. This data review was not focused on minor data issues but on identifying possible existing and/or upcoming critical operational issues.

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Overall performance is within operation parameters.

LEWES BPW WWTP Biweekly InSight Report

Date: 9/23/2020

From: Erin Horocholyn - Suez Water Technologies & Solutions
 To: Dave Weed, Darrin Gordon
 cc: Matt Stapleford - Suez Water Technologies & Solutions

System Equipment

4 × ZW trains, each train consists of 4 - 500D cassettes, 120 modules x 370 sq. ft. per train (surface area 44,400 sq. ft. per train)

Replacement membranes installed Q1 2020 on all 4 trains

Cleaning Strategy

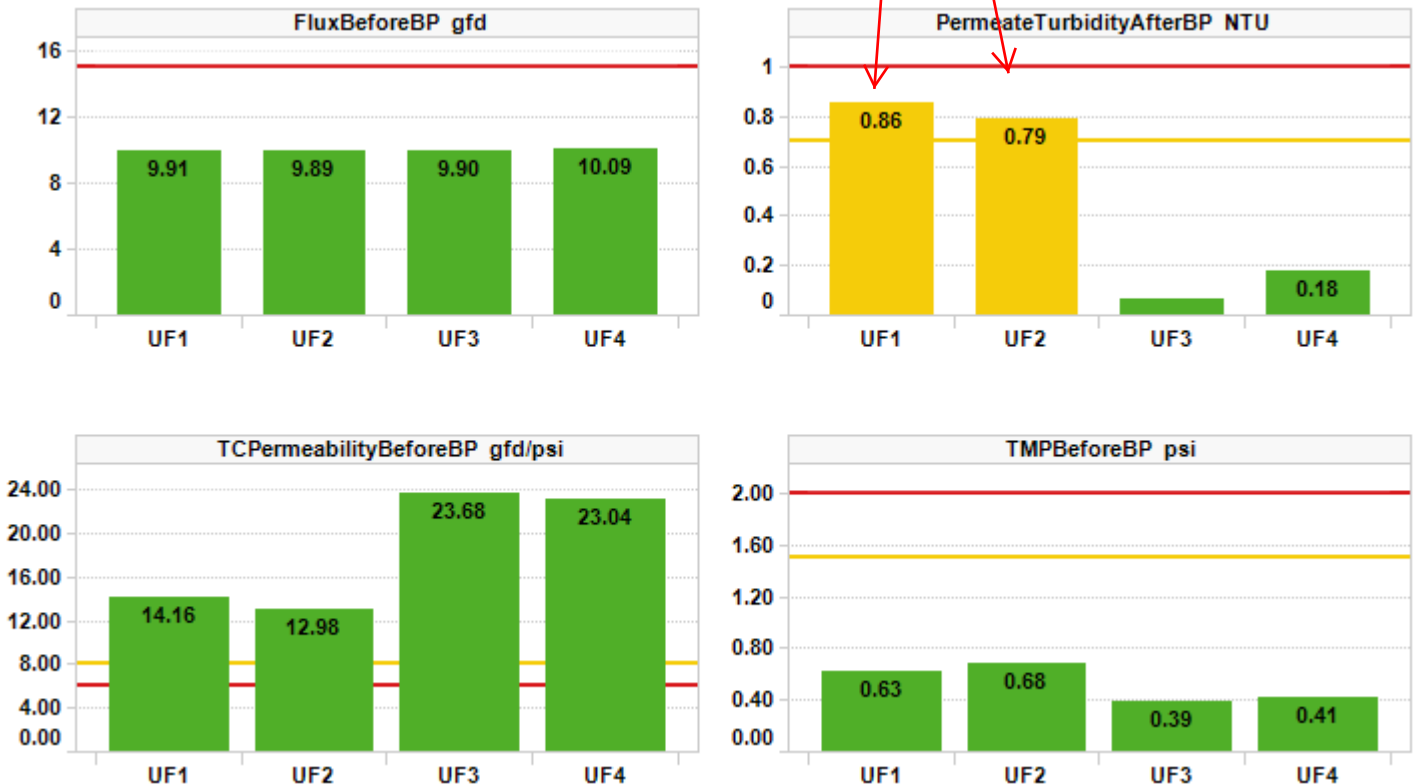
Recovery cleaning - 2 NaOCl @ 2000 ppm dose/1000 ppm soak per year, 1 Citric acid @ 2000 ppm per year

Maintenance cleaning - 1 NaOCl per week @ 200 ppm, 1 Citric acid per week @ 2000 ppm

Some issues with air bubbles being caught in the turbidimeters. This did not affect performance.

KPI Dashboard – Avg values through reporting period

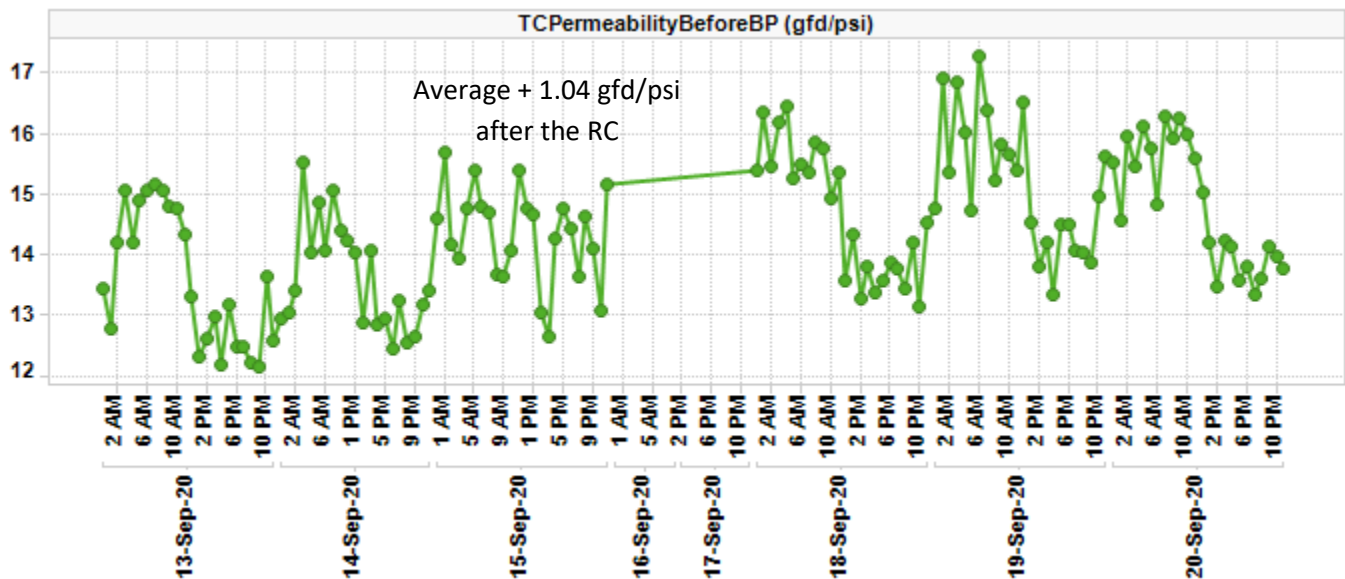
■ Action Required
■ Caution
■ No Limits
■ Normal



Plant Summary

Overall, the plant operated well. Turbidity has increased on UF1 and UF2. Acid MCs are now being scheduled on all trains. A recovery clean was run on UF1 over Sept 16 – 17, seeing a small permeability improvement of +1.04 gfd/psi.

- Train UF4 ran intermittently during this period, seeing some activity Sept 10, 14, 16, 17, and 21
- TC permeability BBP was good on all trains, and excellent on trains UF3 and UF4. UF1 and UF2 averaged 14.16 and 12.98 gfd/psi respectively. UF3 and UF4 averaged 23.68 and 23.04 gfd/psi respectively. For reference, TC permeability BBP is considered good above 8 gfd/psi
- Average TMP was great on all trains. UF1 and UF2 averaged 0.63 and 0.68 psi, while UF3 and UF4 averaged 0.39 and 0.41 psi. For reference, excellent TMP is below 1.0 psi
- Permeate turbidity was above 0.10 NTU on UF1, UF2, and UF4, averaging 0.86 (+48% higher than last report), 0.79 (+28% higher than last report), and 0.18 respectively. UF3 averaged 0.07 NTU. For reference, excellent turbidity is less than 0.1 NTU, and good turbidity less than approximately 0.3 NTU
- Flux ranged from 9.89 – 10.09 gfd and is mostly even across trains. Even flux between trains is beneficial for even wear across the membrane trains over time
- A recovery clean (RC) was run on UF1 from Sept 16 – 17th, first running with chlorine, then with citric acid, with a total of ~22 hours of soak time. Pre-RC permeability averaged 13.84 gfd/psi, and post-RC permeability averaged 14.88 gfd/psi, with a total increase of + 1.04 gfd/psi. TMP decreased from average 0.615 psi to 0.607 psi, with a total decrease of 0.008 psi. RC results are usually stronger with a larger impact, however the TMP was already fairly low before the cleaning. This may indicate there was not much foulants for the RC to remove at this time
- Below, the plot shows hourly averages for TC permeability, with a gap during the RC. The date range includes 3 days before and after the RC. The slight increase in permeability can be seen after the RC in the following days



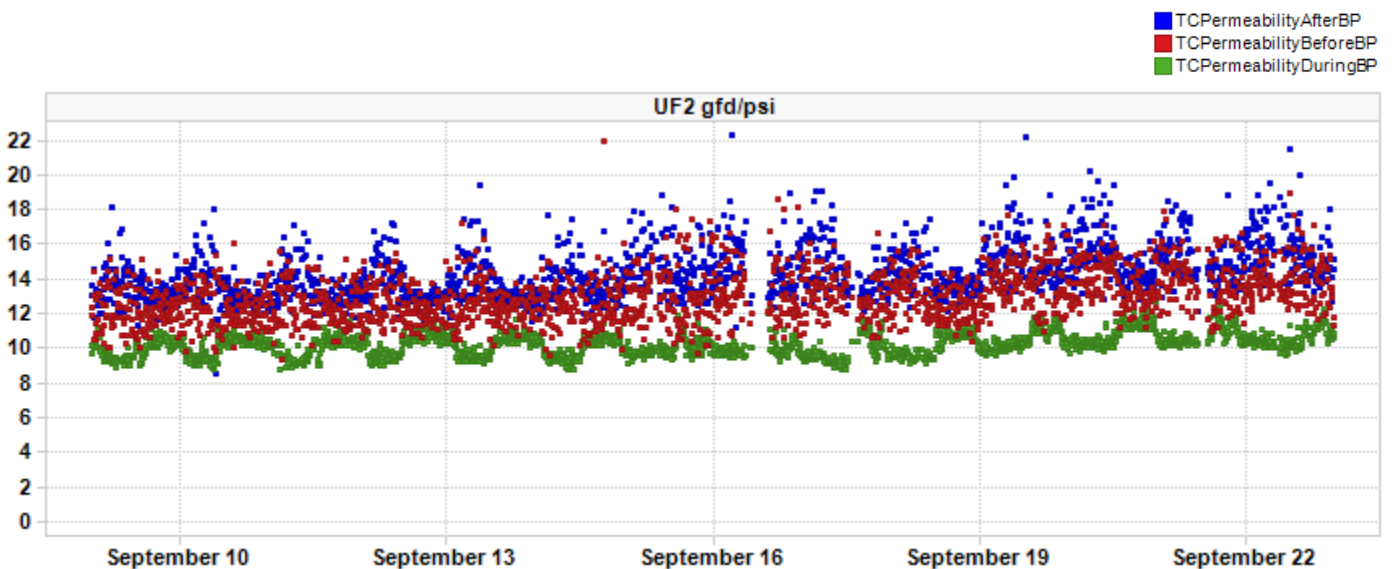
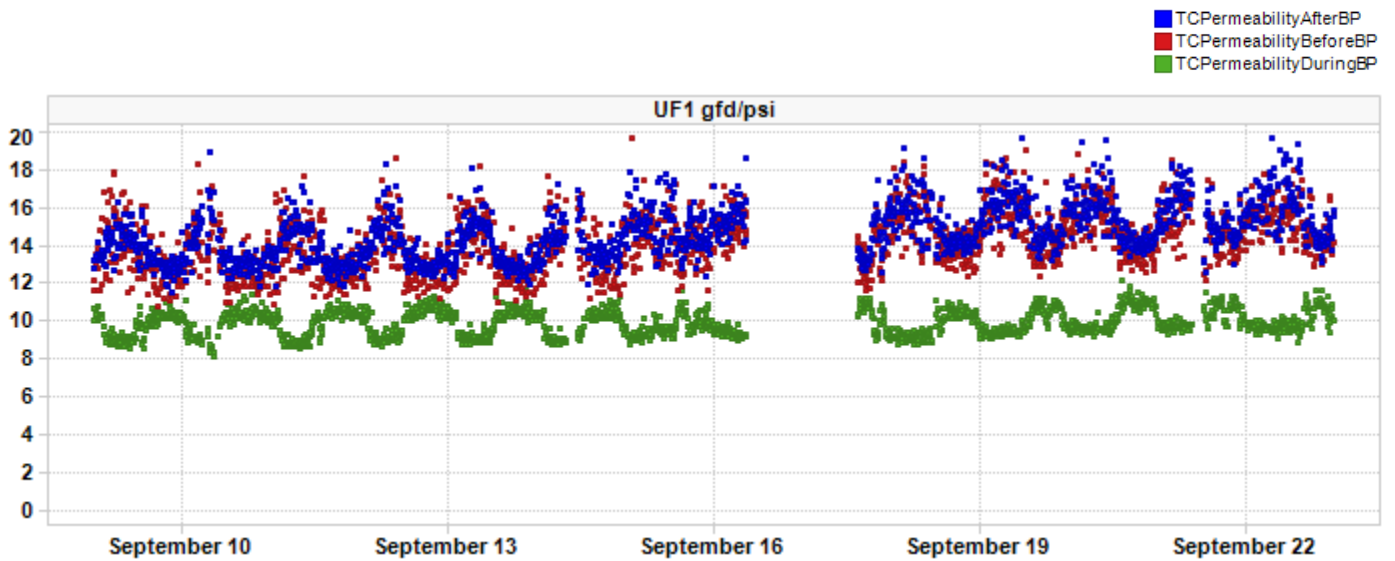
Acronyms:

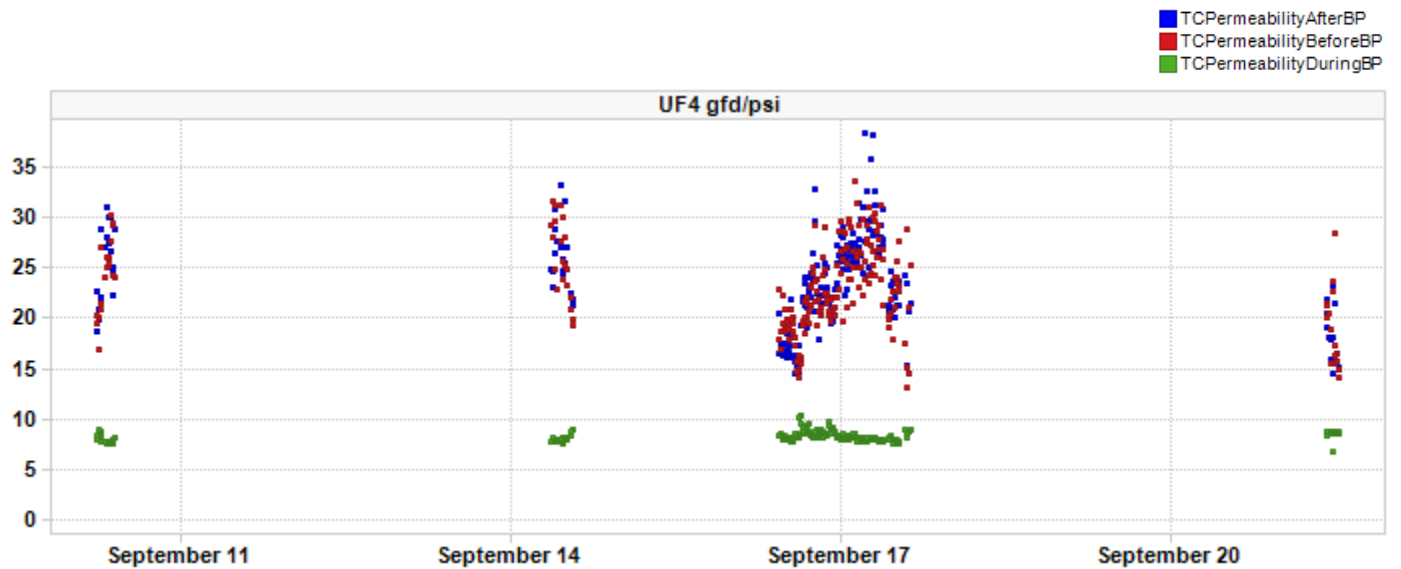
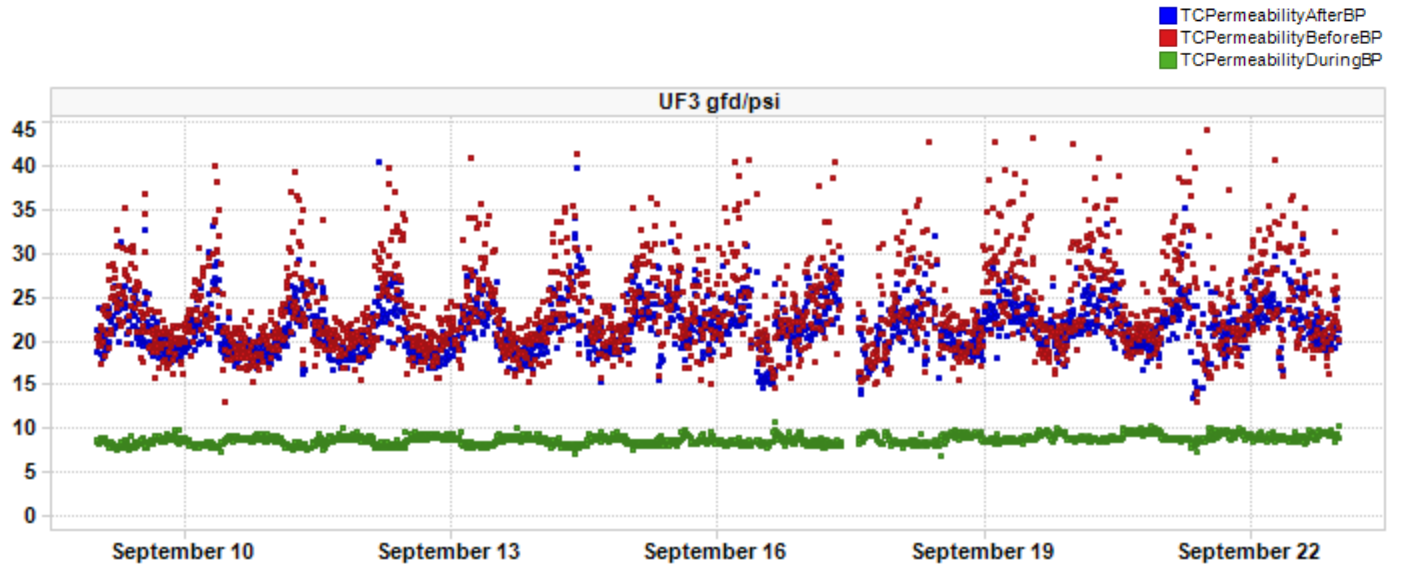
TC = temperature corrected, BBP = before backpulse, RC = recovery clean, MC = maintenance clean, TMP = trans membrane pressure

- Maintenance clean (MC) design specifies 1 hypochlorite/chlorine MC and 1 citric acid MC per week, per train. Design pH for hypochlorite MCs is maximum 10.5, and for citric acid MCs the ideal range is 2.5 – 3.5. There are currently about 2 hypochlorite MCs being run per week, per train, which is double the design requirements. As well, citric acid MCs are now being run at the design 1/week per train

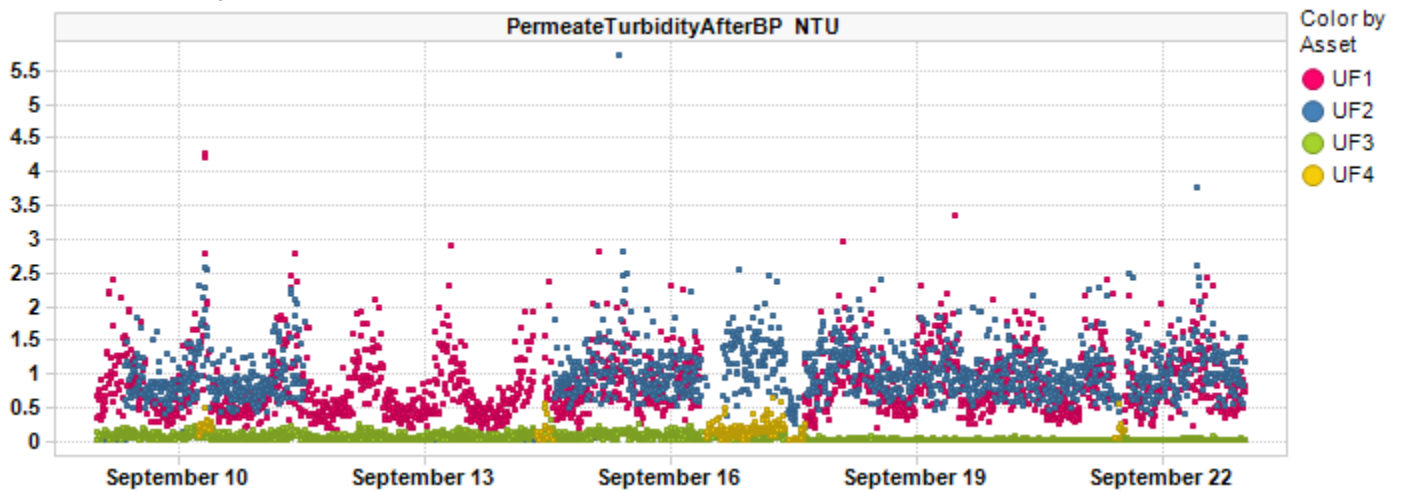
Asset	Date	MC Chemical	Asset	Date	MC Chemical
UF1	Sept 8	Chlorine	UF3	Sept 8	Chlorine
	Sept 10	Chlorine		Sept 11	Chlorine
	Sept 14	Chlorine		Sept 14	Acid
	Sept 14	Acid		Sept 15	Chlorine
	Sept 17	Chlorine		Sept 18	Chlorine
	Sept 21	Chlorine		Sept 21	Acid
	Sept 21	Acid		Sept 22	Chlorine
UF2	Sept 8	Chlorine	UF4	Sept 8	Chlorine
	Sept 11	Chlorine		Sept 10	Chlorine
	Sept 14	Acid		Sept 14	Chlorine
	Sept 15	Chlorine		Sept 14	Acid
	Sept 18	Chlorine		Sept 21	Chlorine
	Sept 21	Acid		Sept 21	Acid
	Sept 22	Chlorine			

TC Permeability Trends By Train

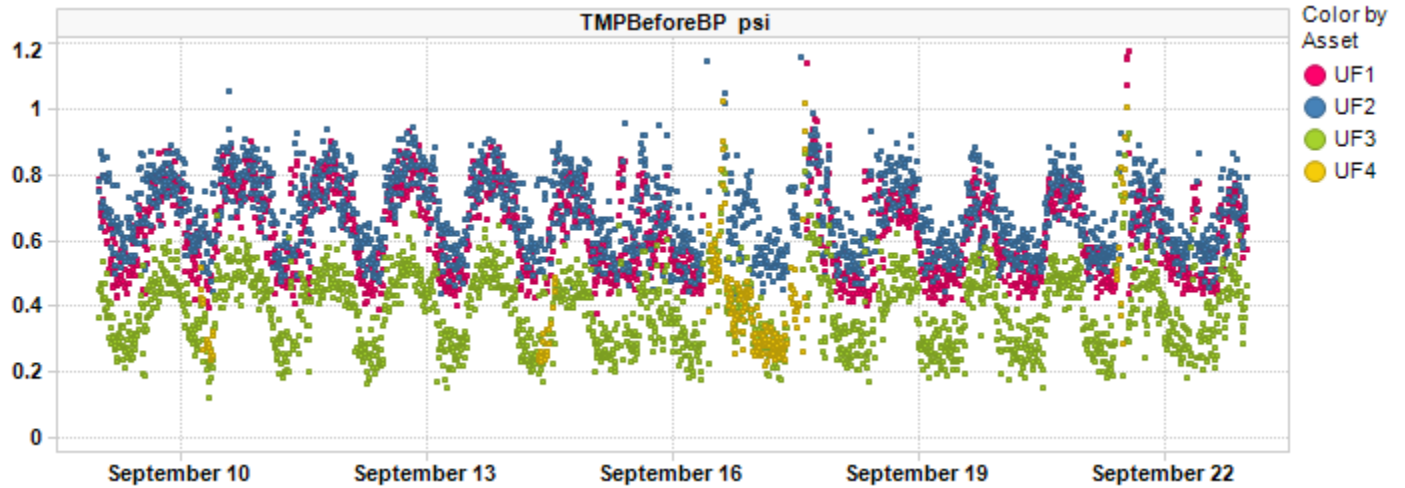




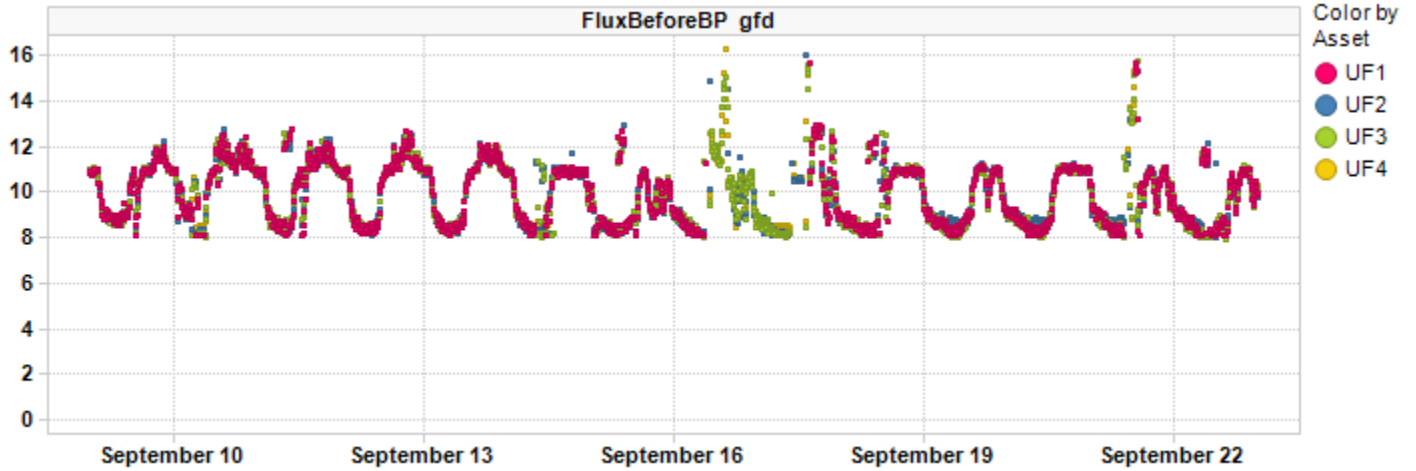
Permeate Turbidity Trend



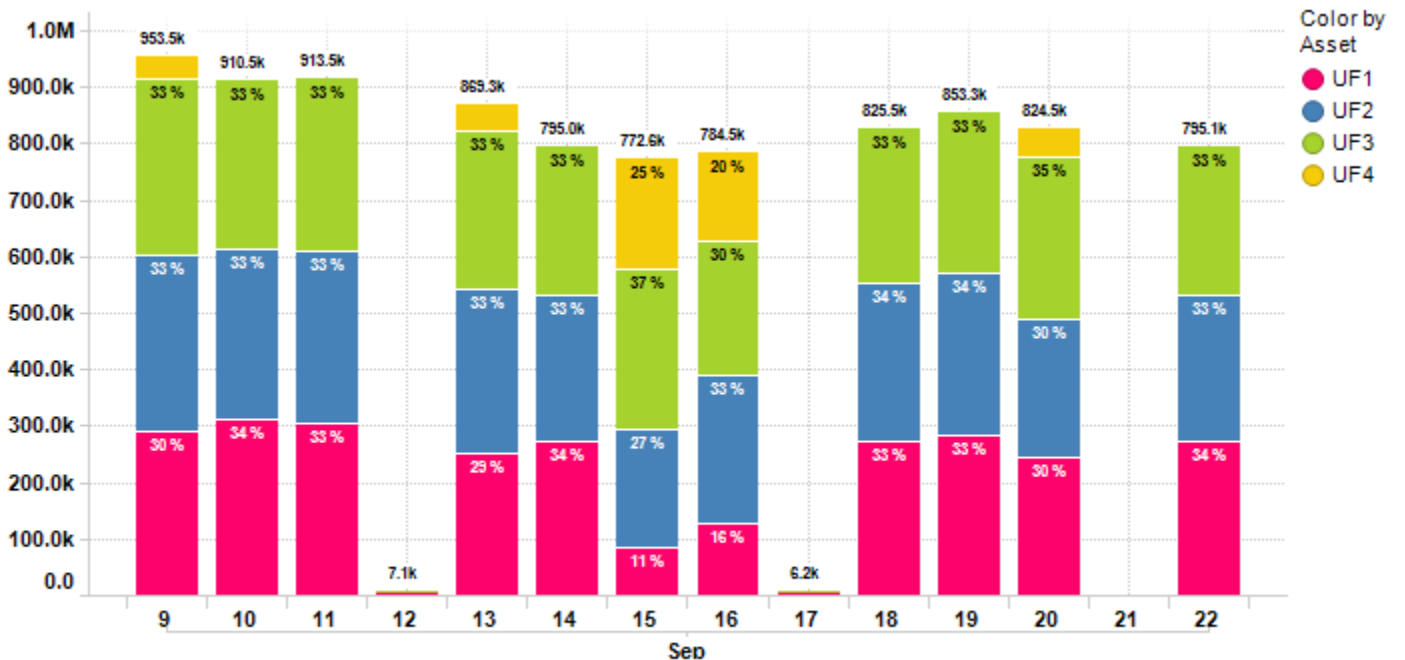
Before BPTMP Trend



Before BP Flux Trend



Daily Permeate Flow



Average Daily permeate flow from 9/9/2020 to 9/22/2020 is 716.2k gal with a maximum daily flow of 953.5k gal.

Asset Summary

KPI Parameters	Value/Change	UF1	UF2	UF3	UF4
FluxBeforeBP gfd	Value	9.91	9.89	9.90	10.09
	Change	-4.86 %	-6.36 %	-8.51 %	-4.71 %
FluxDuringBP gfd	Value	18.86	18.61	18.53	18.87
	Change	0.11 %	0.43 %	-0.23 %	0.50 %
PermeateTurbidityAfterBP NTU	Value	0.86	0.79	0.07	0.18
	Change	48.04 %	27.72 %	-20.46 %	33.13 %
TCPermeabilityBeforeBP gfd/psi	Value	14.16	12.98	23.68	23.04
	Change	-0.87 %	0.41 %	7.45 %	2.77 %
TMPBeforeBP psi	Value	0.63	0.68	0.39	0.41
	Change	-5.40 %	-3.69 %	-14.34 %	-6.10 %
TotalPermeateFlowDaily gal	Value	209.48k	231.82k	237.54k	37.38k
	Change	-14.67 %	-22.73 %	15.70 %	-382.96 %

Plant Summary

KPI Parameters	Value/Change	UF Plant
TotalPermeateFlowDaily gal	Value	808.69k
	Change	-23.49 %

Contract Expiry Date : (Empty)

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Overall performance is within operation parameters

LEWES BPW WWTP Biweekly InSight Report

Date: 10/7/2020

From: Erin Horocholyn - Suez Water Technologies & Solutions
 To: Dave Weed, Darrin Gordon
 cc: Matt Stapleford - Suez Water Technologies & Solutions

System Equipment

4 × ZW trains, each train consists of 4 - 500D cassettes, 120 modules x 370 sq. ft. per train (surface area 44,400 sq. ft. per train)

Replacement membranes installed Q1 2020 on all 4 trains

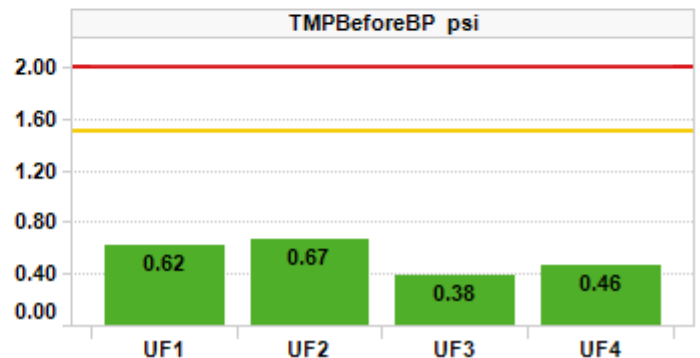
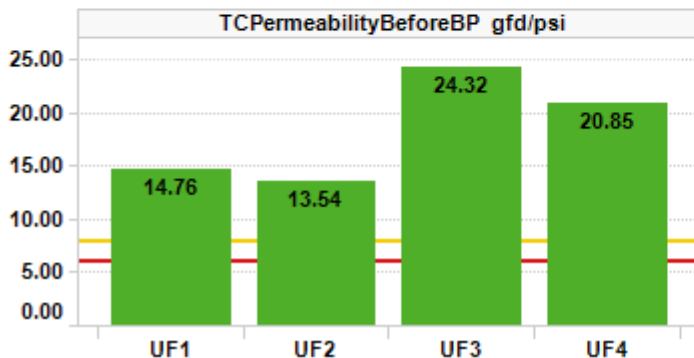
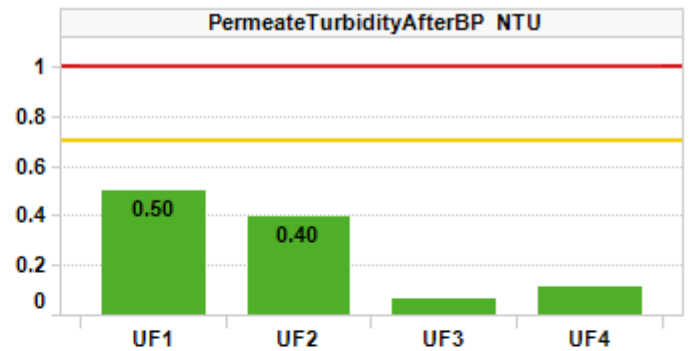
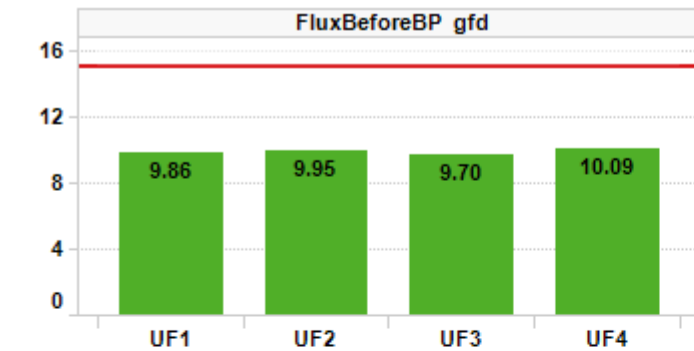
Cleaning Strategy

Recovery cleaning - 2 NaOCl @ 2000 ppm dose/1000 ppm soak per year, 1 Citric acid @ 2000 ppm per year

Maintenance cleaning - 1 NaOCl per week @ 200 ppm, 1 Citric acid per week @ 2000 ppm

KPI Dashboard – Avg values through reporting period

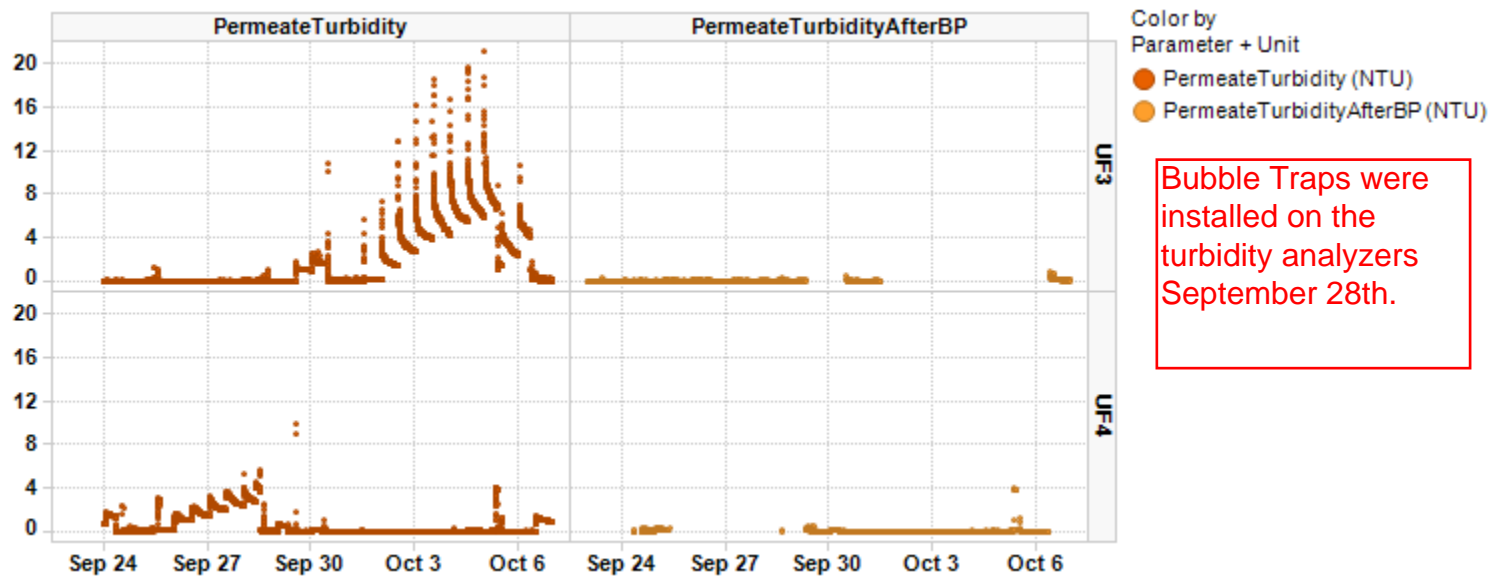
■ Action Required
■ Caution
■ No Limits
■ Normal



Plant Summary

Overall, the plant operated well. Turbidity has decreased on UF1 and UF2 since the previous report. A recovery clean was run on UF2 and UF3 on Sept 24 and 29th respectively. RC results did not improve permeability significantly.

- Daily permeate production averaged 859 kgal, excluding days without permeate production. Max flow occurred on Oct 2 at 964 kgal with UF1, UF2, and UF4 active. Average daily permeate production by train was 221 kgal for UF1, 175 kgal for UF2, 130 kgal for UF3, and 135 kgal for UF4
- Flux ranged from 9.70 – 10.09 gfd and is mostly even across trains. Even flux between trains is beneficial for even wear across the membrane trains over time
- TC permeability BBP was good on all trains, and excellent on trains UF3 and UF4. UF1 and UF2 averaged 14.76 and 13.54 gfd/psi respectively. UF3 and UF4 averaged 24.32 and 20.85 gfd/psi respectively. For reference, TC permeability BBP is considered good above 8 gfd/psi
- Average TMP was great on all trains. UF1 and UF2 averaged 0.62 and 0.67 psi, while UF3 and UF4 averaged 0.38 and 0.46 psi. For reference, excellent TMP is below 1.0 psi
- Permeate turbidity ABP was above 0.10 NTU on UF1, UF2, and UF4, averaging 0.50, 0.40, and 0.11 NTU respectively. Last report, UF1 and UF2 had turbidities above the High limit of 0.70 NTU; this report both train's turbidities have dropped to prior levels. UF3 averaged 0.07 NTU. For reference, excellent turbidity is less than 0.1 NTU, and good turbidity less than approximately 0.3 NTU
- Comparing the tags PermeateTurbidity (PT) and PermeateTurbidityAfterBP (PTABP), there are some unusual PT trends apparent on UF3 and UF4. PTABP samples the raw data tag PT after each backpulse, and therefore can miss data present in PT if it occurs outside the data trigger to bring it into PTABP. In this case, both periods of spiking started when the train entered Standby and resolved when the train re-entered Production. The trends have resolved as of Oct 6 for UF1, and Sept 28 for UF2



- Maintenance clean (MC) design specifies 1 hypochlorite/chlorine MC and 1 citric acid MC per week, per train. Design pH for hypochlorite MCs is maximum 10.5, and for citric acid MCs the ideal range is 2.5 – 3.5
 - UF1 had 2 citric and 4 chlorine MCs over the past 2 weeks
 - UF2 had 1 citric and 4 chlorine MCs over the past 2 weeks
 - UF3 and UF4 had 1 citric and 3 chlorine MCs over the past 2 weeks

- A recovery clean (RC) was run on UF2 on Sept 24, and on UF3 on Sept 29. UF2 and UF3 first ran chlorine and soaked for 19 hours, followed by citric with a 3-hour soak. Details are summarized in the table below. Both RCs saw little or no permeability increase. Design pH for chlorine RCs is maximum 10.5, and for citric acid RCs the ideal range is 2.5 – 3.5. During an RC it is good practice to measure pH throughout the clean to see if there is a changing trend as the chemical is consumed by foulants. If the pH strays outside these ranges, more chemical can be added to maintain the soak pH and target cleaning concentration

TCP = temperature corrected permeability before backpulse

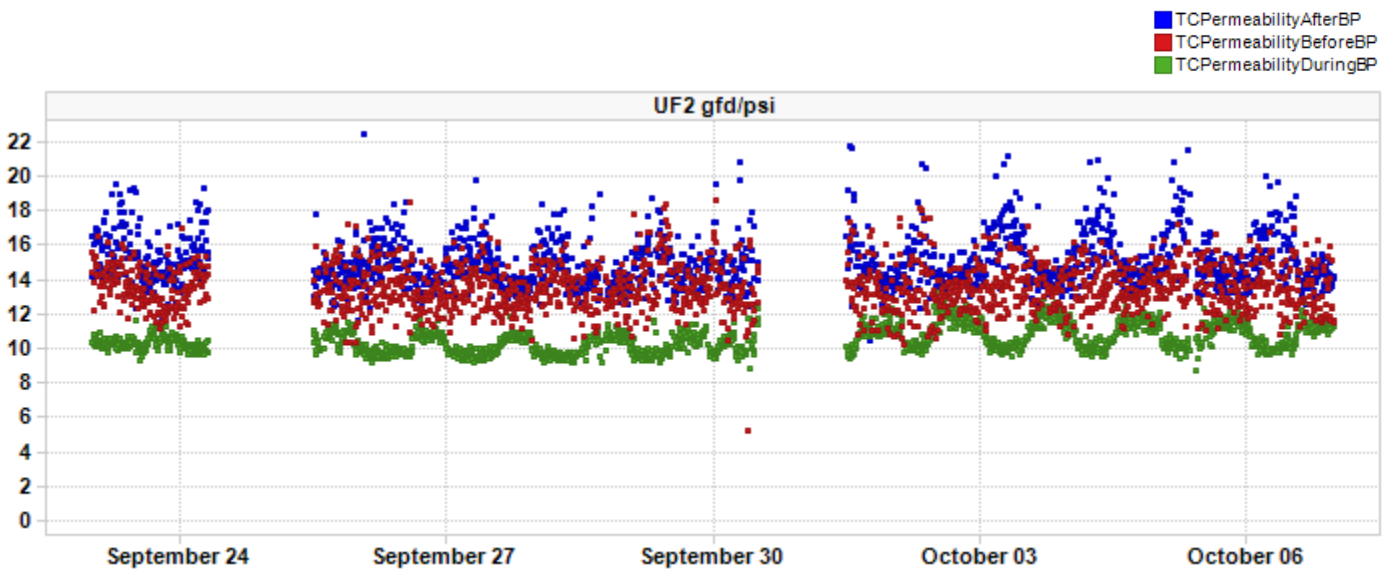
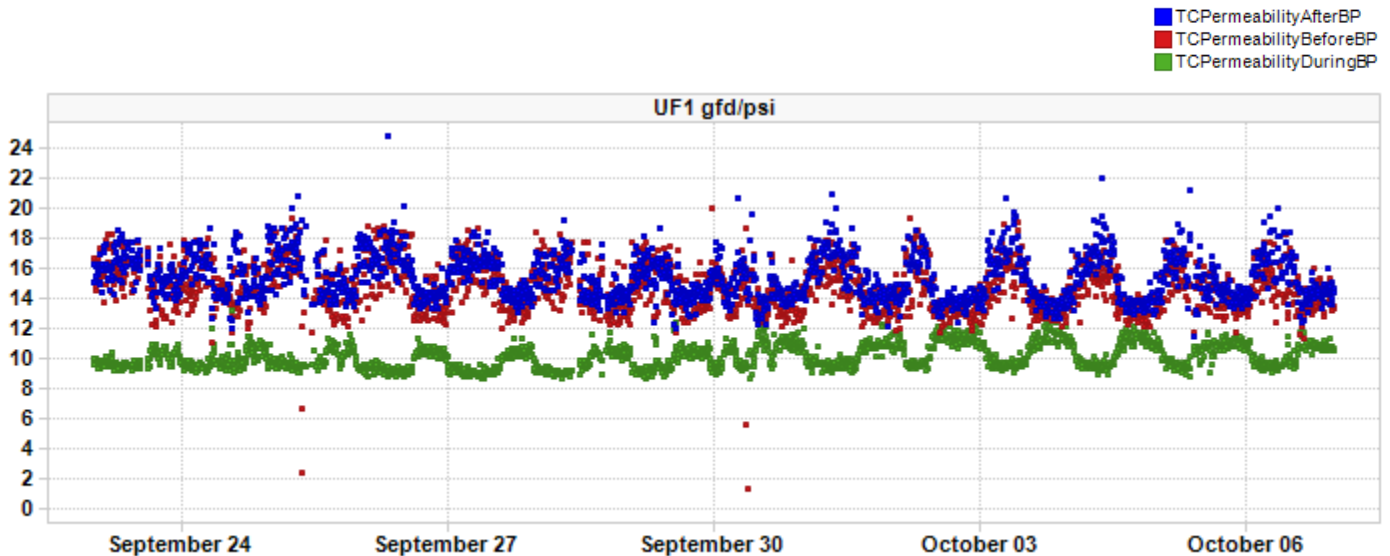
Train	Date	Pre-RC TCP (gfd/psi)	Post-RC TCP (gfd/psi)	TCP Change (gfd/psi)
UF2	Sept 24	13.64	13.61	~ 0
UF3	Sept 29	24.47	24.75	+ 0.27

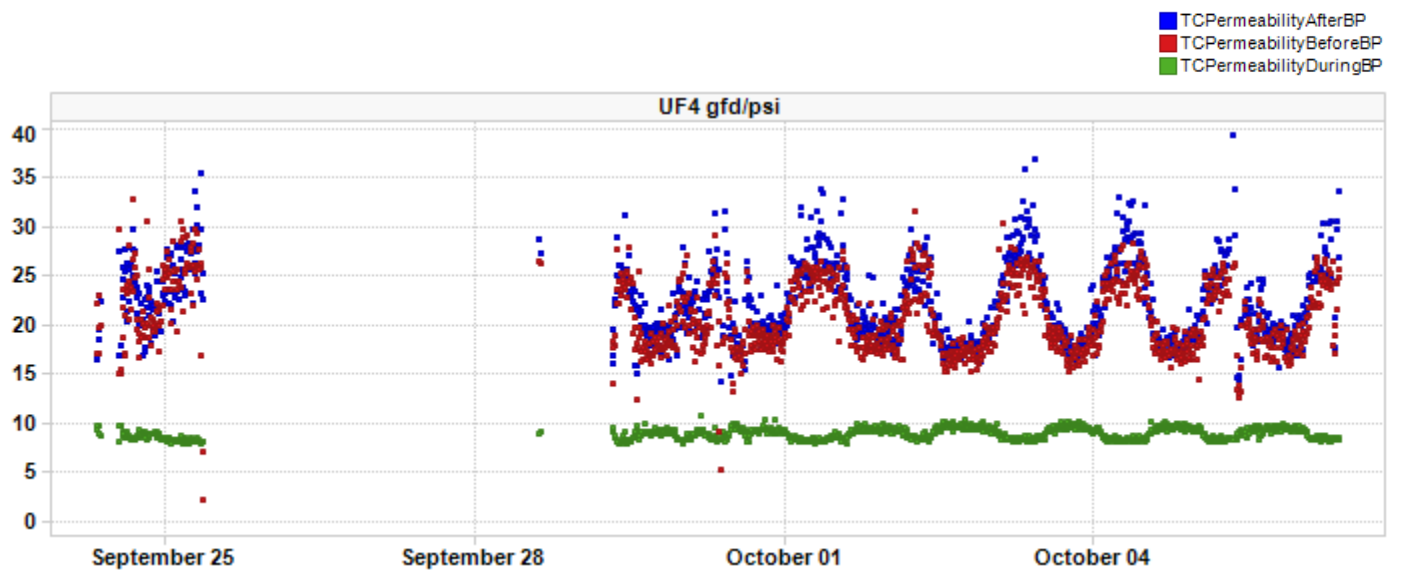
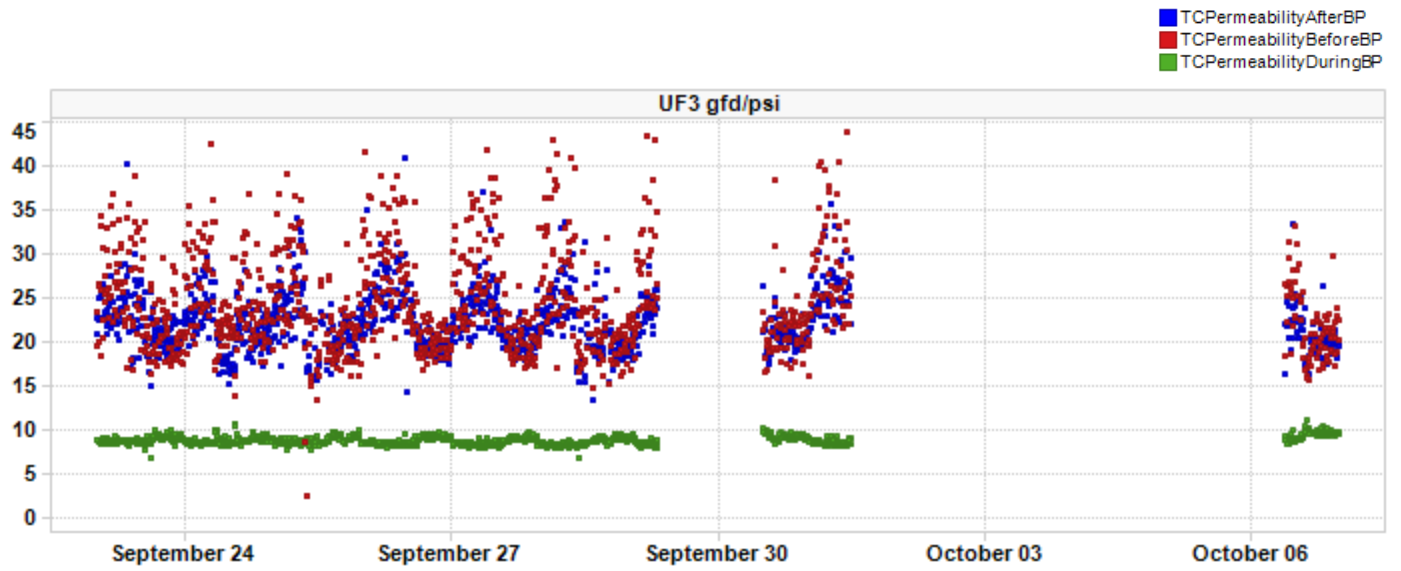
Bi-Annual Chlorine Recovery Cleans for all 4 trains have been completed.

Acronyms:

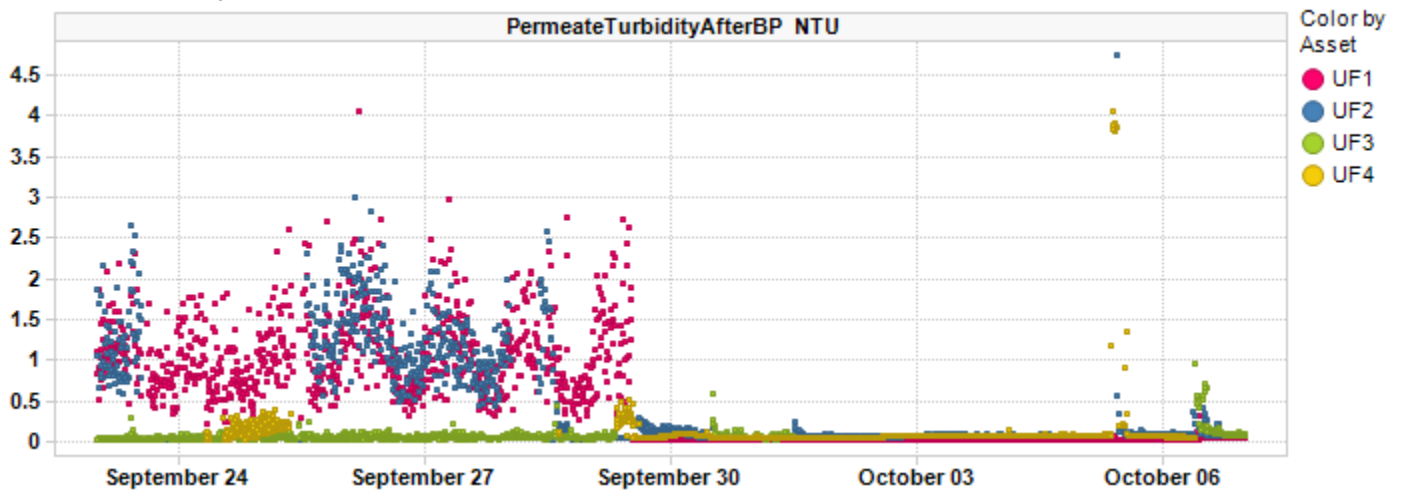
TC = temperature corrected, BBP = before backpulse, ABP = after backpulse, RC = recovery clean, MC = maintenance clean, TMP = trans membrane pressure

TC Permeability Trends By Train

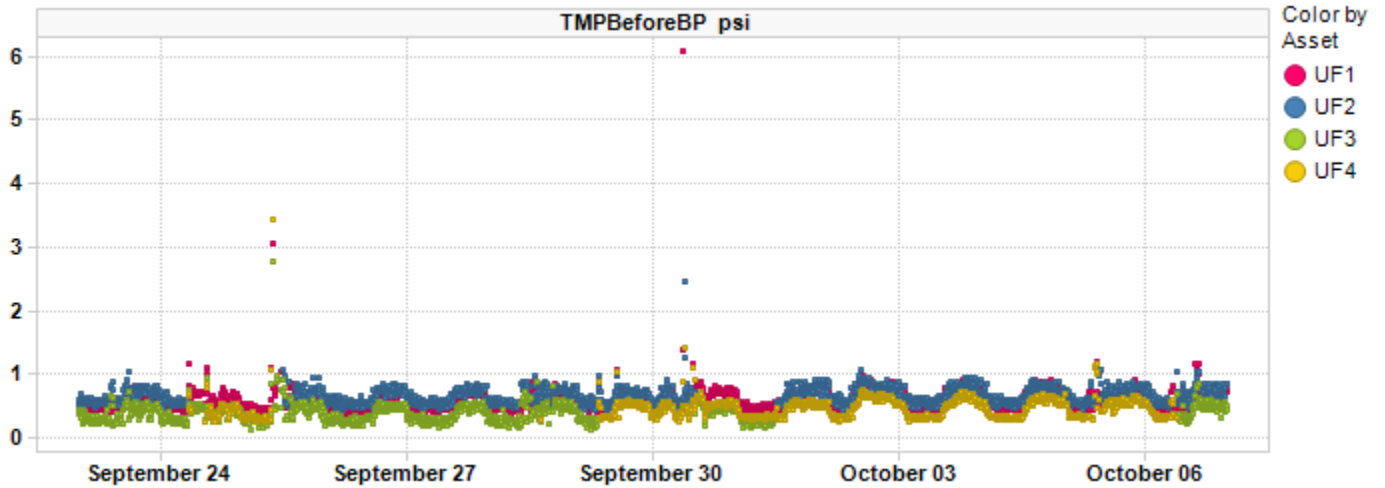




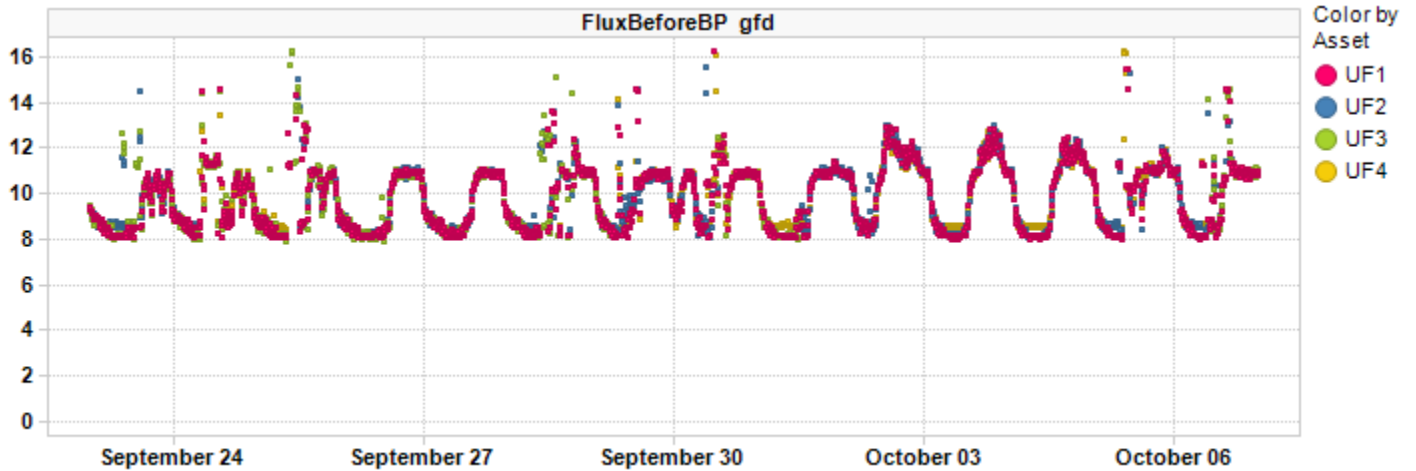
Permeate Turbidity Trend



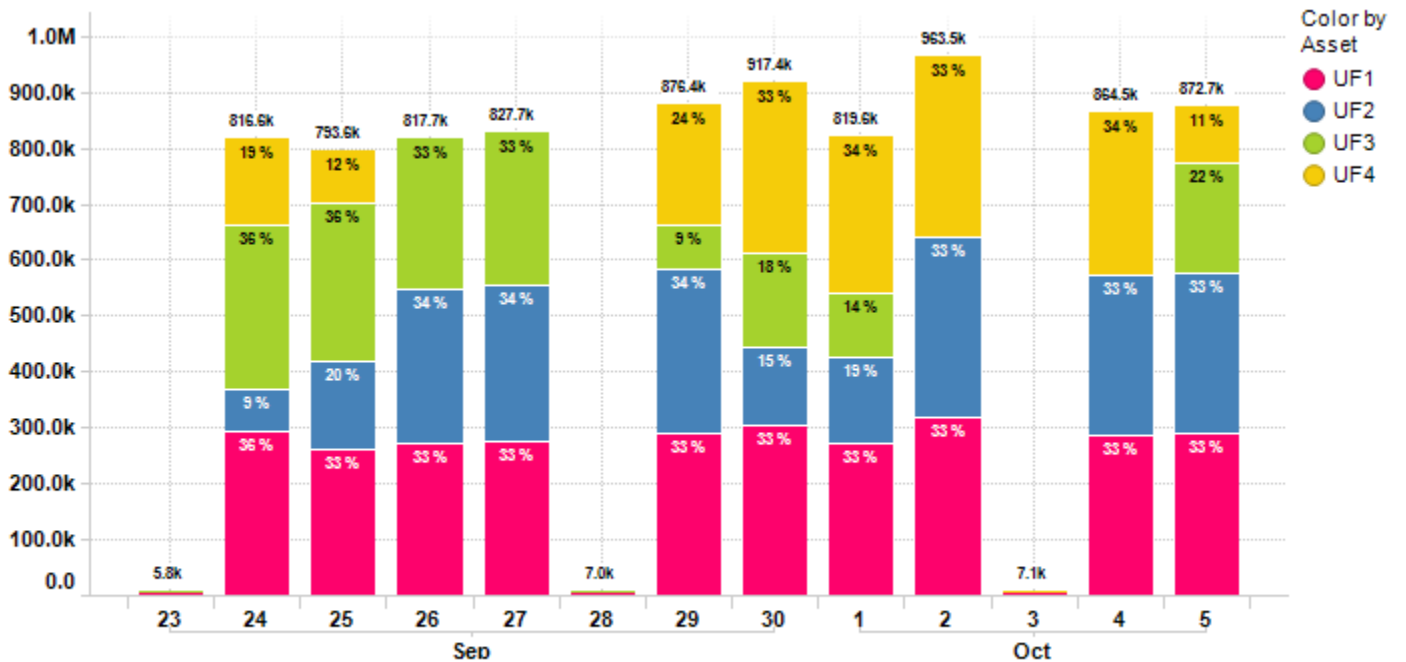
Before BPTMP Trend



Before BP Flux Trend



Daily Permeate Flow



Average Daily permeate flow from 9/23/2020 to 10/6/2020 is 660.7k gal with a maximum daily flow of 963.5k gal.

Asset Summary

KPI Parameters	Value/Change	UF1	UF2	UF3	UF4
FluxBeforeBP gfd	Value	9.86	9.95	9.70	10.09
	Change	-0.57 %	0.59 %	-2.06 %	0.05 %
FluxDuringBP gfd	Value	18.85	18.67	18.54	18.85
	Change	-0.04 %	0.32 %	0.03 %	-0.09 %
PermeateTurbidityAfterBP NTU	Value	0.50	0.40	0.07	0.11
	Change	-70.21 %	-99.12 %	0.29 %	-57.03 %
TCPermeabilityBeforeBP gfd/psi	Value	14.76	13.54	24.32	20.85
	Change	4.03 %	4.15 %	2.63 %	-10.52 %
TMPBeforeBP psi	Value	0.62	0.67	0.38	0.46
	Change	-1.59 %	-1.46 %	-1.58 %	10.51 %
TotalPermeateFlowDaily gal	Value	220.93k	175.22k	129.53k	135.06k
	Change	5.18 %	-32.30 %	-83.39 %	72.33 %

Plant Summary

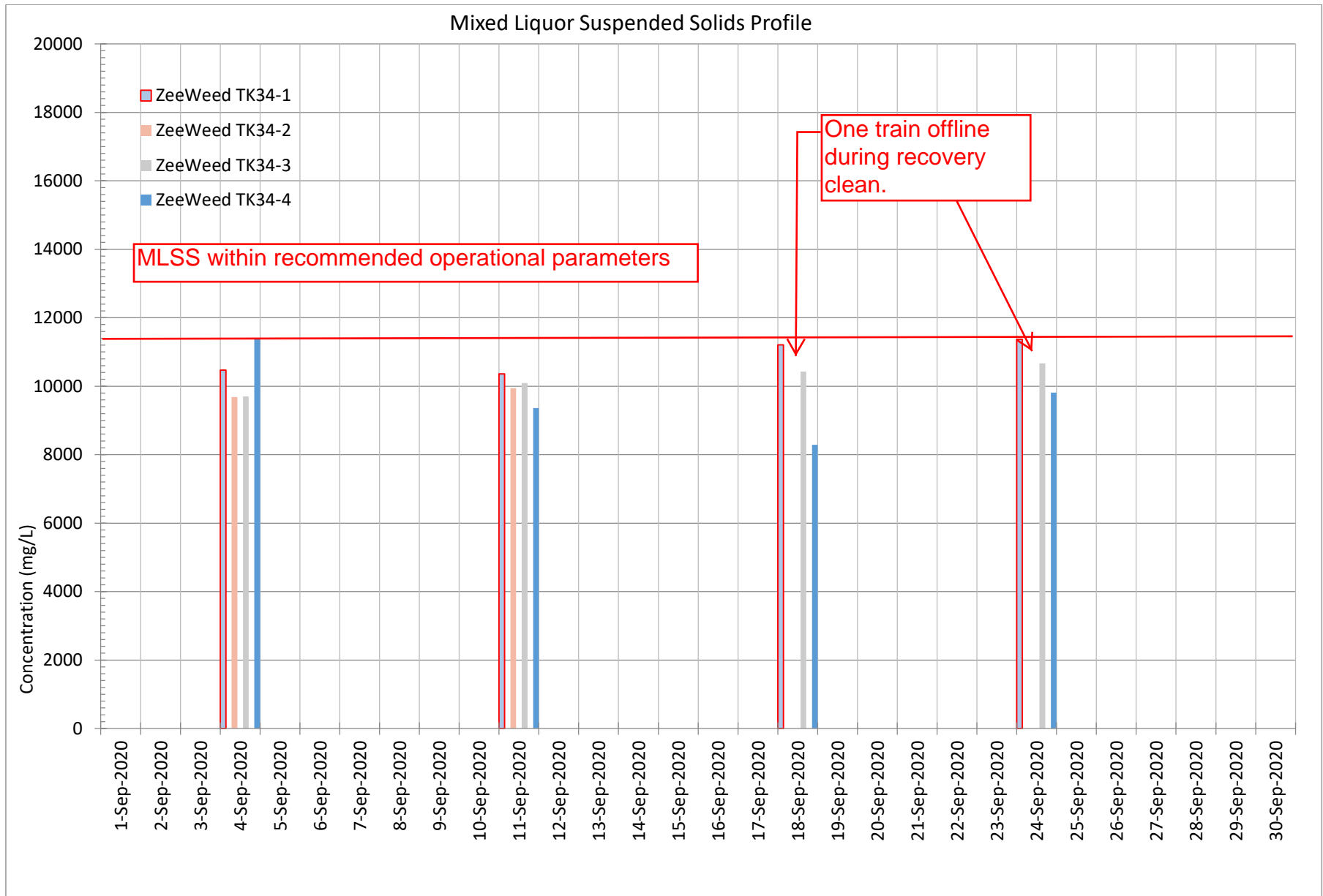
KPI Parameters	Value/Change	UF Plant
TotalPermeateFlowDaily gal	Value	746.77k
	Change	-8.29 %

Contract Expiry Date : (Empty)

For InSight technical assistance please email insight.src@suez.com or please call technical support at 1 866 271 5425 or 905 469 7723 and follow the prompts, if you require after hours assistance please contact the 24/7 Emergency number provided in your plant documentation. This email is a summary of issues identified during a manual review of InSight data from the time period above. This review is an analysis of data that is logged by InSight and identifies key plant performance issues determined from this data. This data review was not focused on minor data issues but on identifying possible existing and/or upcoming critical operational issues.

This review was prepared by SUEZ Water Technologies & Solutions solely to assist water treatment plant owners and/or operators in analyzing and optimizing plant performance and is not intended to be used or relied upon for regulatory compliance or any other purpose. The content of this review is based in whole or in part on operation data obtained from the plant using InSight software. SUEZ Water Technologies & Solutions makes no representations or warranties as to the accuracy of the plant data utilized in the preparation of this review. SUEZ Water Technologies & Solutions accepts no liability for consequences or actions taken in whole or in part by any person on the basis of this review or its contents

Overall performance is within operation parameters



PUMP STATION 196

Sussex County

Sep-20		PS 196	
		METER READING	24 HOUR FLOW
TUE	1	75706830	0.101990
WED	2	75808820	0.210570
THUR	3	76019390	0.296790
FRI	4	76316180	0.287780
SAT	5	76603960	0.275530
SUN	6	76879490	0.268680
MON	7	77148170	0.262230
TUE	8	77410400	0.236740
WED	9	77647140	0.213000
THUR	10	77860140	0.237660
FRI	11	78097800	0.240250
SAT	12	78338050	0.234780
SUN	13	78572830	0.237080
MON	14	78809910	0.216160
TUE	15	79026070	0.166020
WED	16	79192090	0.138070
THUR	17	79330160	0.143170
FRI	18	79473330	0.152320
SAT	19	79625650	0.149330
SUN	20	79774980	0.200400
MON	21	79975380	0.190150
TUE	22	80165530	0.190780
WED	23	80356310	0.187330
THUR	24	80543640	0.188120
FRI	25	80731760	0.189420
SAT	26	80921180	0.209040
SUN	27	81130220	0.219950
MON	28	81350170	0.225640
TUE	29	81575810	0.269950
WED	30	81845760	0.228420
		82074180	
TOTAL			6.367350
COUNT			30
AVERAGE			0.212245
MINIMUM			0.101990
MAXIMUM			0.296790

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)



PERMITTEE NAME/ADDRESS (include Facility Name/Location if different):

NAME: Howard Seymour Water Reclamation Plant
 ADDRESS: 116 American Legion Road, Lewes, DE 19958 US
 FACILITY: Howard Seymour Water Reclamation Plant
 LOCATION: 116 American Legion Road, Lewes, DE 19958 US

DISCHARGE MONITORING REPORT (DMR)

DE0021512 PERMIT NUMBER 001 DISCHARGE NUMBER
 REPORT DESIGNATOR: A
 DATA ENTRY COMPLETE: 10/9/2020
 REPORT SUBMITTED BY: jmarion@tuiwater.com
 MONITORING PERIOD: FROM 2020 09 01 TO 2020 09 30
 STATUS OF SUBMISSION: Submitted for Signature

#	PARAMETER	NDI	QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
			AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
1/1	Flow	SAMPLE MEASUREMENT	0.877	1.6004	Mil Gal/Day				--	0	99/99	RCOTOT
	Gross Effluent (50050)	PERMIT REQUIREMENT	No Limit Monitoring Req'd	No Limit Monitoring Req'd	Mil Gal/Day	No Monitoring Required	No Monitoring Required	No Monitoring Required	--	--	99/99	RCOTOT
1/2	Dissolved oxygen (DO)	SAMPLE MEASUREMENT			--	2.92		4.8	mg/l	0	99/99	Imersion
	Gross Effluent (00300)	PERMIT REQUIREMENT	No Monitoring Required	No Monitoring Required	--	No Limit Monitoring Req'd	No Monitoring Required	No Limit Monitoring Req'd	mg/l	--	99/99	Imersion
1/3	pH	SAMPLE MEASUREMENT			--	7.3		7.6	Std pH Units	0	01/01	Grab
	Gross Effluent (00400)	PERMIT REQUIREMENT	No Monitoring Required	No Monitoring Required	--	6	No Monitoring Required	9	Std pH Units	--	01/01	Grab
1/4	Enterococcus	SAMPLE MEASUREMENT			--	<1.2		2	CFU/100 ML	0	01/07	Grab
	Gross Effluent (31639)	PERMIT REQUIREMENT	No Monitoring Required	No Monitoring Required	--	No Monitoring Required	10	104	CFU/100 ML	--	01/07	Grab
1/5	BOD5	SAMPLE MEASUREMENT	<2.67	<19.37	lbs/Day		<2.4	<2.4	mg/l	0	01/07	Composite 24
	Gross Effluent (00310)	PERMIT REQUIREMENT	188	288	lbs/Day	No Monitoring Required	15	23	mg/l	--	01/07	Composite 24
1/6	BOD5	SAMPLE MEASUREMENT			--		190.2	213	mg/l	0	01/30	Composite 24
	Raw Sewage (00310)	PERMIT REQUIREMENT	No Monitoring Required	No Monitoring Required	--	No Monitoring Required	No Limit Monitoring Req'd	No Limit Monitoring Req'd	mg/l	--	01/30	Composite 24
1/7	TSS	SAMPLE MEASUREMENT	<0.85	<9.82	lbs/Day		<0.78	<1.4	mg/l	0	01/07	Composite 24
	Gross Effluent (00530)	PERMIT REQUIREMENT	188	288	lbs/Day	No Monitoring Required	15	23	mg/l	--	01/07	Composite 24

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED, BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.	[ATTACH DIGITAL SIGNATURE RECEIPT FROM CROMERR]	TELEPHONE	DATE		
			SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MO	DAY
TYPED OR PRINTED						

NDI (No Data Indicator) Reasons: 8 - No Sample (Other); 9 - No Sample (Monitoring Not Required this Monitoring Period); B - Not Detected; C - No Sample (No Discharge)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)



PERMITTEE NAME/ADDRESS (include Facility Name/Location if different):

NAME: Howard Seymour Water Reclamation Plant
 ADDRESS: 116 American Legion Road, Lewes, DE 19958 US
 FACILITY: Howard Seymour Water Reclamation Plant
 LOCATION: 116 American Legion Road, Lewes, DE 19958 US

DISCHARGE MONITORING REPORT (DMR)
 PERMIT NUMBER: DE0021512
 DISCHARGE NUMBER: 001
 REPORT DESIGNATOR: A
 DATA ENTRY COMPLETE: 10/9/2020
 REPORT SUBMITTED BY: jmarion@tuiwater.com
 MONITORING PERIOD: FROM 2020 09 01 TO 2020 09 30
 STATUS OF SUBMISSION: Submitted for Signature

#	PARAMETER	SAMPLE MEASUREMENT	NDI	QUANTITY OR LOADING			QUALITY OR CONCENTRATION			NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE	
				AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM				UNITS
2/1	TSS	SAMPLE MEASUREMENT				--		165.34	214	mg/l	0	01/30	Composite 24
	Raw Sewage (00530)	PERMIT REQUIREMENT	-	No Monitoring Required	No Monitoring Required	--	No Monitoring Required	No Limit Monitoring Req'd	No Limit Monitoring Req'd	mg/l	--	01/30	Composite 24
2/2	Total Nitrogen	SAMPLE MEASUREMENT		20.04	22.11	lbs/Day		2.74	2.74	mg/l	0	01/30	Composite 24
	Gross Effluent (00600)	PERMIT REQUIREMENT	-	100	No Limit Monitoring Req'd	lbs/Day	No Monitoring Required	8	No Limit Monitoring Req'd	mg/l	--	01/30	Composite 24
2/3	Phosphorus, Total	SAMPLE MEASUREMENT		4.97	5.49	lbs/Day		0.68	0.68	mg/l	0	01/30	Composite 24
	Gross Effluent (00665)	PERMIT REQUIREMENT	-	25	No Limit Monitoring Req'd	lbs/Day	No Monitoring Required	2	No Limit Monitoring Req'd	mg/l	--	01/30	Composite 24

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

All parameters within permit limits.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.	[ATTACH DIGITAL SIGNATURE RECEIPT FROM CROMERR]	TELEPHONE	DATE		
		TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		YEAR	MO


NDI (No Data Indicator) Reasons: 8 - No Sample (Other); 9 - No Sample (Monitoring Not Required this Monitoring Period); B - Not Detected; C - No Sample (No Discharge)

LEWES WWTF

NUTRIENT OFFSET REPORT

MONTH	Days	Average Monthly Flow	Monthly Average TN	Total Monthly TN Discharged	TN Based 11.8 lbs Manure Offset Required	Poultry Manure Relocated		Poultry Manure Offset Balance	Monthly Average TP	Total Monthly TP Discharged	TP Based 11.8 lbs Manure Offset Required
		MGD	mg/L	Lbs.	Lbs.	Tons	Lbs.	Lbs.	mg/L	Lbs.	Lbs.
Carry Over								3,195,312.26			
January	31	0.6789	7.74	1358.55	16030.85		-	3,179,281.41	0.15	26.33	310.68
February	29	0.8255	1.16	231.60	2732.88		-	3,176,548.53	0.06	11.58	136.64
March	31	0.8058	1.15	239.58	2827.06		-	3,173,721.47	0.07	14.58	172.08
April	30	0.6604	0.90	148.71	1754.76		-	3,171,966.70	0.51	84.27	994.37
May	31	0.7431	2.52	484.15	5712.91		-	3,166,253.79	1.71	328.53	3876.62
June	30	0.9442	1.97	465.39	5491.61		-	3,160,762.18	1.31	309.47	3651.78
July	31	0.9745	1.16	292.26	3448.65		-	3,157,313.53	1.45	365.32	4310.82
August	31	0.7711	5.26	1048.63	12373.89		-	3,144,939.64	1.18	235.25	2775.89
September	30	0.8770	2.74	601.23	7094.46		-	3,137,845.18	0.68	149.21	1760.67
October	31			0.00	0.00		-	3,137,845.18		0.00	0.00
November	30			0.00	0.00		-	3,137,845.18		0.00	0.00
December	31			0.00	0.00		-	3,137,845.18		0.00	0.00
Year Balance								3,137,845.18			

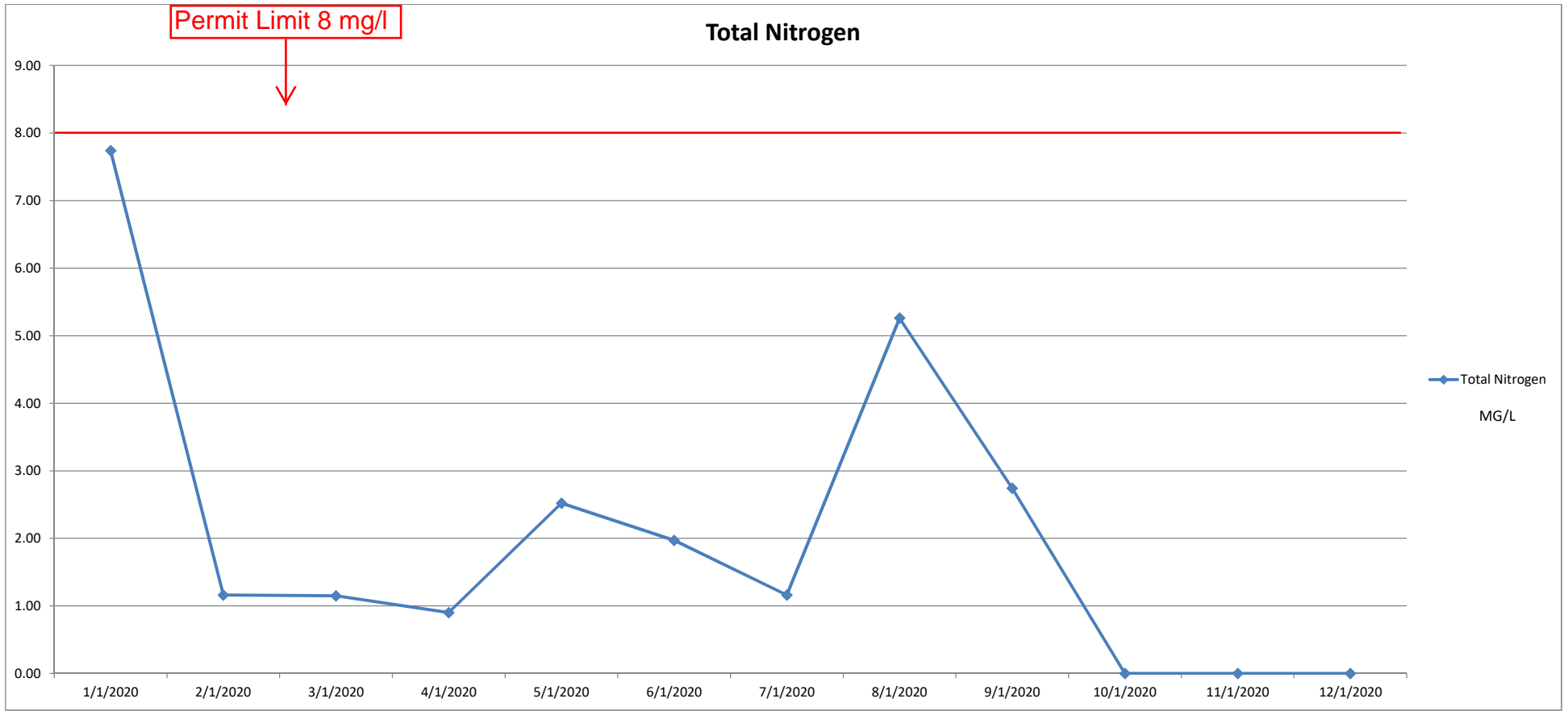
Comments:



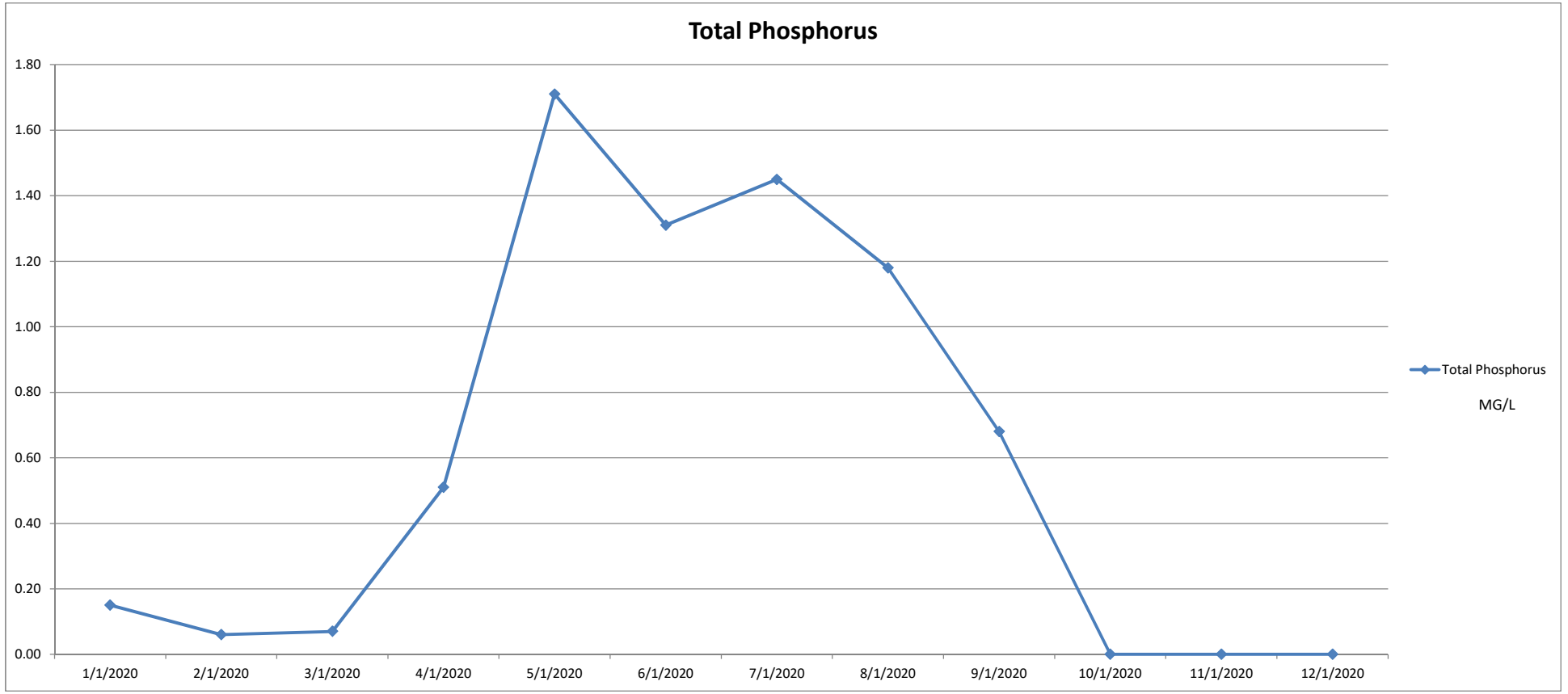
 Authorized Signatory

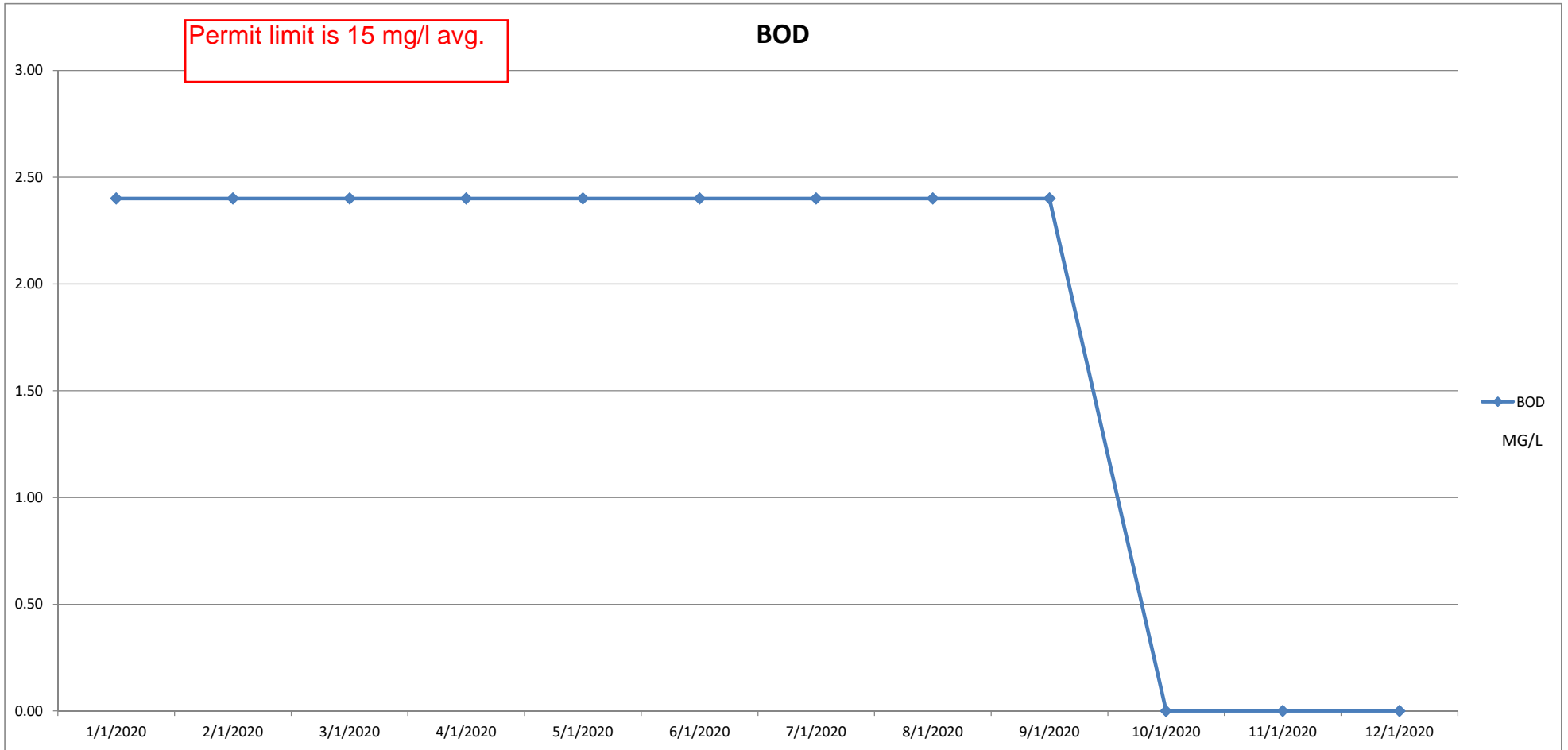
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 DATE

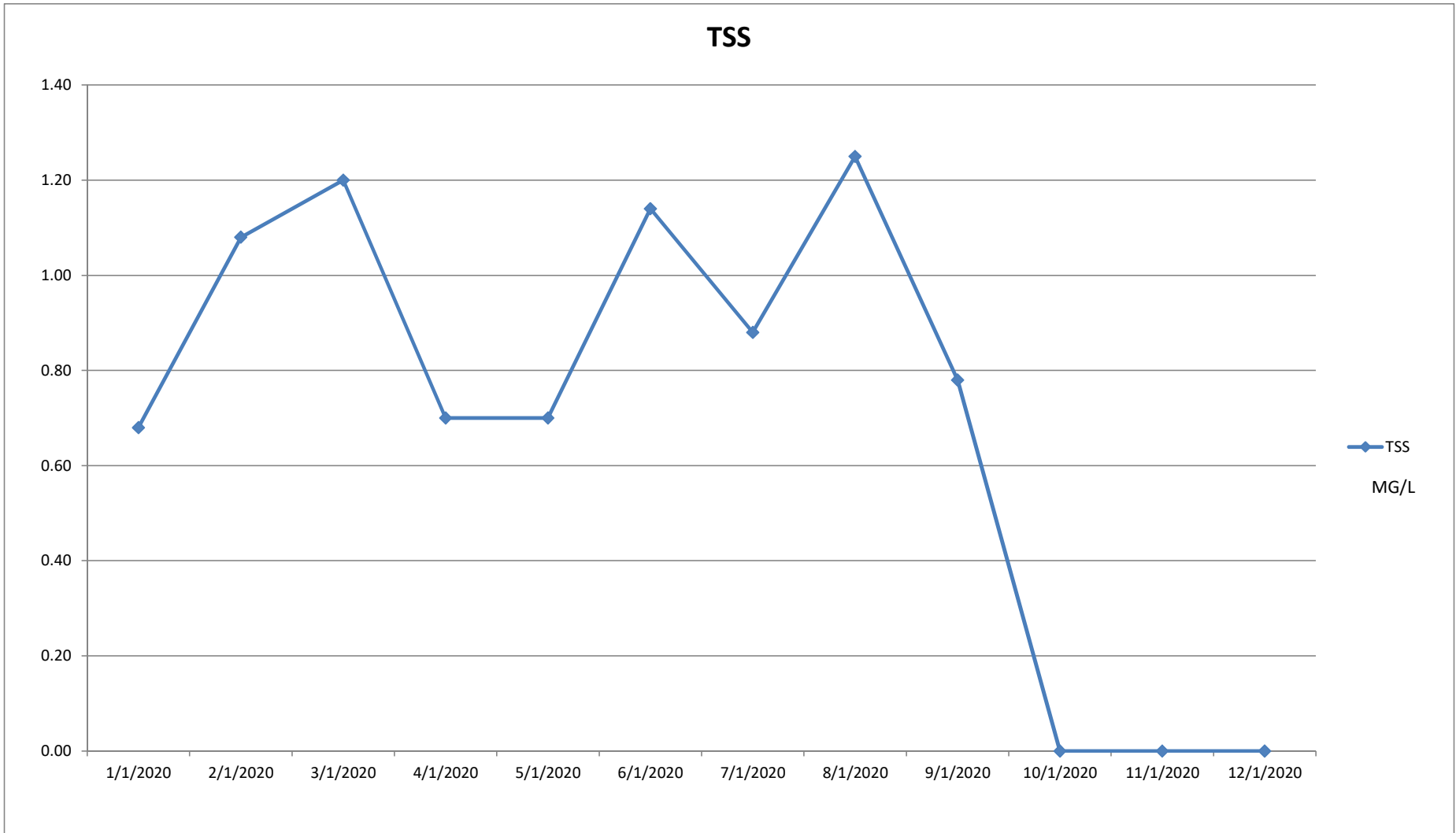


Permit Limit is 2 mg/l avg.

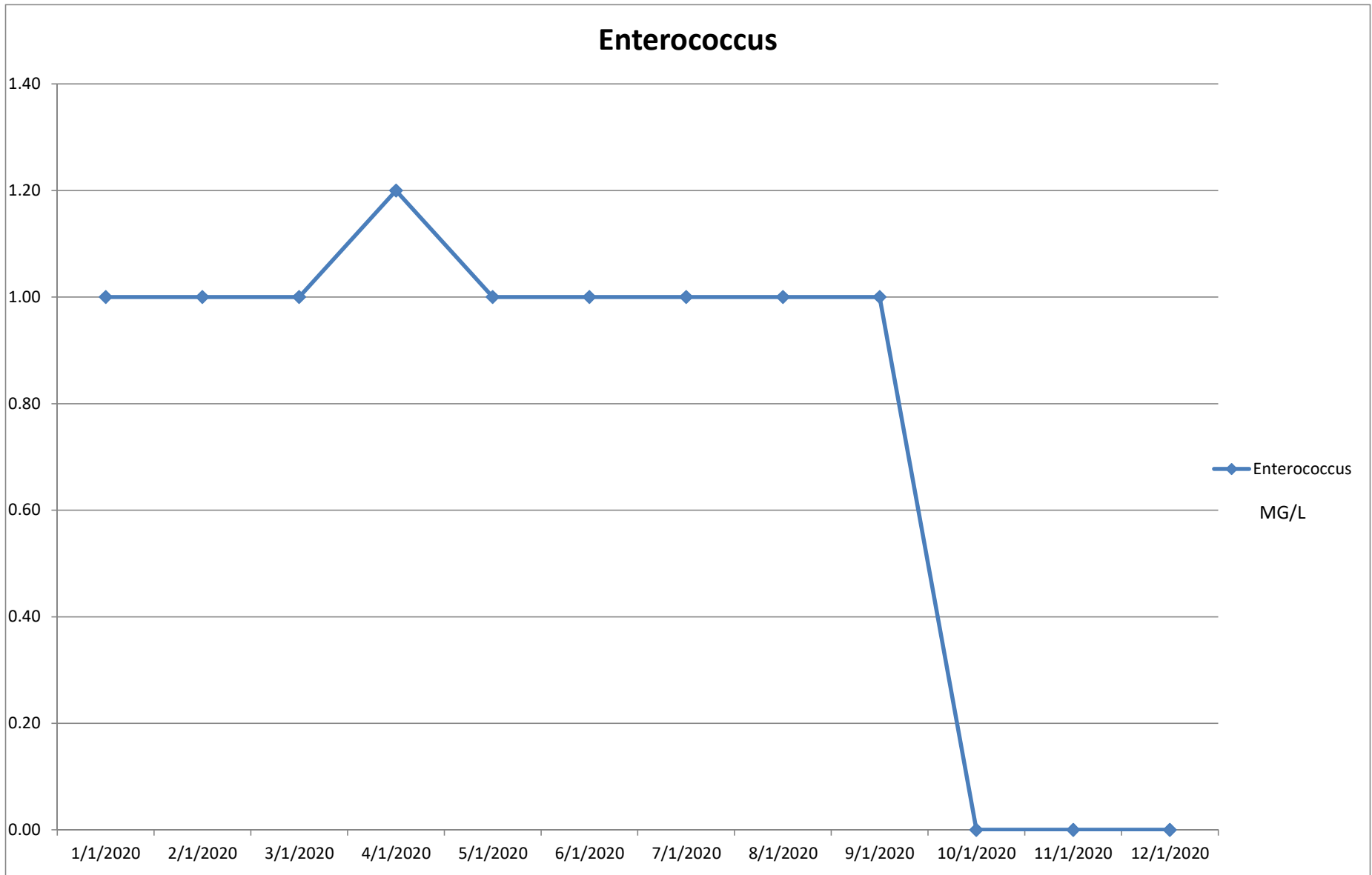




Permit limit is 15 mg/l avg.



Permit limit is 10 coliform avg.



WHITE MARSH ENVIRONMENTAL SYSTEMS, INC.
MONTHLY OPERATING REPORT - LEWES WASTEWATER TREATMENT PLANT
ROOT CAUSE REPORT - CORRECTIVE ACTIONS SUMMARY - SEPTEMBER 2020

Action Item	Due Date	Action Owner	Status Open/ Complete/ Ongoing	Comments/Notes
1. Replace all four trains of filter membranes	May 2020	BPW	Complete	Installation is complete.
2. Reset Turbidity set-point to Manufacture recommended setting	February 2020	WMES	Complete	Reset as of February 13, 2020.
3. Replace all four Turbidity monitors with new models that have additional functionality, including the ability to alarm on loss of flow.	February 2020	WMES	Complete	New model turbidity monitors installed as of February 13, 2020.
4. Have the BPW consulting engineers and BPW staff perform Quarterly WWTF walk through to evaluate the field condition, maintenance records, compliance records and the operation and maintenance of the WWTF.	February 2020	BPW	Complete	GMB performed their first walkthrough for the BPW on February 18, 2020. Paul Peris of WMES accompanied GMB on the walkthrough. WMES received a copy of the report from the first walkthrough on 4-30-20. Second walkthrough was performed on 5-19-20.
5. Review and update the plant Operation and Maintenance Manual to ensure that the current plant configuration is captured, including other updates such as Suez's recommendation on chemical and mechanical cleaning	5/1/2020	BPW	Complete	Darrin Gordon issued an Updated Suez O and M Manual in electronic format to WMES representative on March 3, 2020. WMES is maintaining the electronic version and a hard copy desk version on-site at the Howard H. Seymour Water Reclamation Facility.
6. Issue Contract with Suez to remotely collect data (Insight-Pro) and provide cloud-based access to the data for BPW and plant operator. Suez will monitor and trend data, provide bi-weekly reporting and cleaning recommendations. Suez will provide an annual summary report.	5/1/2020	BPW	Complete	Suez notified the BPW and WMES that the PLC was shipped on April 29, 2020. When the PLC is received by the BPW, it will be installed by the BPW's consultant (Keystone) in consultation with Suez. Programming of new panel scheduled for week of 6-15-20. Suez technician was onsite 6/15/20 to upload the programming for the new control panel. The Insight system is no online due to communication issues. BPW, Josh Gritton, is working with Suez and Keystone to solve the issue. 7/30/20 - Insight system is online and communicating to Suez as of 6/10/20.
7. Perform an engineering analysis of the entire plant to identify ways to improve redundancy and reliability of the plant, including:	6/30/2020	BPW	Open	
a. Review current screen design to determine if there is a way to remove more of the "soft and spongy" material to reduce filter	6/30/2020	BPW	Open	
b. Potential for splitting the four filter trains to have them operate in a redundant parallel configuration	6/30/2020	BPW	Open	
c. Configuration of turbidity meters to provide better protection against use of dirty water during back flush cycle	6/30/2020	BPW	Open	
8. WMES to establish an improvement program for monitoring of plant performance to be evaluated and accepted by BPW. The Corrective Actions contained in the WMES report are not detailed enough to provide assurance to BPW that the plant is being operated to industry Best Practices	5/16/2020	WMES	Complete	Included in April Monthly Report to BPW.

WHITE MARSH ENVIRONMENTAL SYSTEMS, INC.
MONTHLY OPERATING REPORT - LEWES WASTEWATER TREATMENT PLANT
ROOT CAUSE REPORT - CORRECTIVE ACTIONS SUMMARY - SEPTEMBER 2020

Action Item	Due Date	Action Owner	Status Open/ Complete/ Ongoing	Comments/Notes
9. Improve reporting requirements from WMES to BPW for:	5/16/2020	WMES	Complete/Ongoing	Started in April Monthly Report to BPW.
a. Off-normal conditions at the plant	5/16/2020	WMES	Complete/Ongoing	Started in April Monthly Report to BPW.
b. Discharges outside of Permit limits	5/16/2020	WMES	Complete/Ongoing	Started in April Monthly Report to BPW.
c. OSHA accidents	5/16/2020	WMES	Complete/Ongoing	Started in April Monthly Report to BPW.
d. Details included in monthly reports (to include trending of performance data, trending of equipment failures, preventative maintenance required, suggested capital improvements and other concerns)	5/16/2020	WMES	Complete/Ongoing	Started in April Monthly Report to BPW.
e. WMES to present their report at the monthly BPW meeting	5/16/2020	WMES	Complete/Ongoing	Started in April Monthly Report to BPW.
f. Require, as per the contract, a detailed yearly reporting on the operation of the plant to include the items listed in a. through d.	1/15/2021	WMES	Open	To be included in Annual Report to BPW beginning with the 2020 Annual Report.
10. BPW staff to strengthen its oversight of Operators performance				
a. Through the review of trending data in monthly and annual reports	5/16/2020	BPW	Complete/Ongoing	BPW indicates that its staff will commence this as part of the April monthly report process.
b. Schedule routine plant walk through with plant WMES management	5/16/2020	BPW	Complete/Ongoing	BPW indicates that its staff will commence this as part of the April monthly report process.
c. Annual review of WMES Policies and Procedures	5/16/2020	BPW	Complete/Ongoing	BPW indicates that its staff will commence this as part of the April monthly report process.
d. Reporting to the BPW Board of condition of the plant	5/16/2020	BPW	Complete/Ongoing	BPW indicates that its staff will commence this as part of the April monthly report process.
e. Developing of an open Item tracking system	5/16/2020	BPW	Complete/Ongoing	BPW indicates that its staff will commence this as part of the April monthly report process.
11. BPW Board of Directors to review its oversight function of the operation of the BPW.				
a. Continue to use outside subject matter experts such as Sargent and Lundy, Suez, GMB, etc. to provide the Board with guidance on the condition of the BPW systems	Annually	BPW	Open	To be completed annually by BPW. Schedule to be determined and added to tracking list that will be developed in Corrective Action 10. e.
b. Perform audit by a sub-group of the Board of the BPW operation and management systems				
12. WMES to develop plans for operating plant in off-normal conditions. BPW provided WMES with a Best Practices template and copy of the prior operating company plan. This should include, but not be limited to:	4/16/2020	WMES/BPW	Complete/Open	WMES portion complete, to be submitted as part of the amended March 2020 Monthly Report to the BPW. BPW portion Open; to be done by BPW Engineering Consultant.
a. Loss of filter membrane	4/16/2020	WMES/BPW	Complete/Open	WMES portion complete, to be submitted as part of the amended March 2020 Monthly Report to the BPW. BPW portion Open; to be done by BPW Engineering Consultant.
b. Digesters	4/16/2020	WMES/BPW	Complete/Open	WMES portion complete, to be submitted as part of the amended March 2020 Monthly Report to the BPW. BPW portion Open; to be done by BPW Engineering Consultant.
c. Other critical equipment	4/16/2020	WMES/BPW	Complete/Open	WMES portion complete, to be submitted as part of the amended March 2020 Monthly Report to the BPW. BPW portion Open; to be done by BPW Engineering Consultant.
d. Loss of Power	4/16/2020	WMES/BPW	Complete/Open	WMES portion complete, to be submitted as part of the amended March 2020 Monthly Report to the BPW. BPW portion Open; to be done by BPW Engineering Consultant.
e. Storm response	4/16/2020	WMES/BPW	Complete/Open	WMES portion complete, to be submitted as part of the amended March 2020 Monthly Report to the BPW. BPW portion Open; to be done by BPW Engineering Consultant.
f. Security Breach	4/16/2020	WMES/BPW	Complete/Open	WMES portion complete, to be submitted as part of the amended March 2020 Monthly Report to the BPW. BPW portion Open; to be done by BPW Engineering Consultant.
g. Terrorist/cyber terrorist attack	4/16/2020	WMES/BPW	Complete/Open	WMES portion complete, to be submitted as part of the amended March 2020 Monthly Report to the BPW. BPW portion Open; to be done by BPW Engineering Consultant.

WHITE MARSH ENVIRONMENTAL SYSTEMS, INC.
MONTHLY OPERATING REPORT - LEWES WASTEWATER TREATMENT PLANT
ROOT CAUSE REPORT - CORRECTIVE ACTIONS SUMMARY - SEPTEMBER 2020

Action Item	Due Date	Action Owner	Status Open/ Complete/ Ongoing	Comments/Notes
13. BPW to look at other areas of its operation to determine if there are generic implications from the failure at the WWTF a. Evaluate the operation of the Water Department, electrical department and other areas of BPW operation to determine where improvements in Management practices are needed.	Undetermined	BPW	Open	Status: In process – Sargent & Lundy is currently performing a review of the BPW electrical system and will provide input to BPW for future capital projects and areas of improvement. Review quarterly at monthly BPW meeting
14. Require all WMES operational staff to have appropriate training by Suez on the proper operation and maintenance of the filters and plant	5/16/2020	WMES	Complete	Information included in April Monthly Report to BPW. WMES continues to follow-up with Suez on any training opportunities. Covid-19 pandemic has caused previously scheduled opportunities to be cancelled. Suez is looking at potentially having virtual training sessions. Suez will notify WMES if this becomes available. Suez providing training on the Insight system on August 13, 2020. Train is complete.
15. WMES to review its safety manual to verify they are complying with the appropriate CDC guidelines and industry best practices for sanitary conditions. Post the appropriate areas of the plant as no-smoking/no-eating	4/16/2020	WMES	Complete	Commitment due as part of the March 2020 Monthly Report to the BPW.
16. WMES to review its safety practices and plant conditions to determine what changes may be required. Note: The Temporary cabling that was installed to protect employees appears to create other safety concerns.	4/16/2020	WMES	Complete	Commitment due as part of the March 2020 Monthly Report to the BPW.
17. BPW to audit WMES safety procedures and practices to included: a. Lock-out/Tag-out of equipment b. Confined entry permit c. Personal Protective Equipment d. General Housekeeping e. Chemical control and handling	April 2020 April 2020 April 2020 April 2020 April 2020	BPW BPW BPW BPW BPW	Complete Complete Complete Complete Complete	Documents are in a binder at the Lewes WWTP Documents are in a binder at the Lewes WWTP Documents are in a binder at the Lewes WWTP Documents are in a binder at the Lewes WWTP Documents are in a binder at the Lewes WWTP
18. WMES to provide a monthly update on its Corrective Actions to BPW	4/16/2020	WMES	Ongoing	Started as part of the March 2020 Monthly Report to the BPW.
19. BPW Staff to provide an update on the status of the above Corrective Actions at routine monthly BPW meetings. This will be part of the standing agenda for the meetings	4/16/2020	BPW	Ongoing	Initially due as part of the review process of the March 2020 Monthly Report to the BPW.