WHITE MARSH
ENVIRONMENTAL SYSTEMS, INC.
A Middlesex Water Company Affiliate

May 13, 2020

Via Electronic Mail Delivery

Mr. Darrin Gordon
General Manager
Lewes Board of Public Works
107 Franklin Avenue
Lewes, DE 19958

Subject: April 2020 Monthly Report to BPW

Dear Mr. Gordon:

White Marsh Environmental Systems, Inc. (WMES) is pleased to submit the April 2020 monthly report. The report contains a summary of the operations and maintenance activities at the BPW lift stations and wastewater treatment plant by WMES for the month of April, 2020. In addition, the report contains the following documents:

1. Corrective Action Items Summary – This will be submitted each month until all items have been completed.
2. Corrective Action Responses – April 2020. This provides a detailed status of the items requiring an April response.

If you have any questions, please feel free to contact me at pperis@middlesexwater.com.

Sincerely,

Paul S. Peris

Paul S. Peris
Director of Production and Maintenance
White Marsh Environmental Systems, Inc.

April 2020

I. Effluent Quality and Compliance

The data below confirms that the effluent meets all permit requirements.

Sample Data	Total Nitrogen	Total Phosphorus	BOD	TSS	Enterococcus
Average:	**.90 mg/L**	**0.51 mg/L**	**<2.40 mg/L**	**<.70 mg/L**	**<1.2 Col.**
Maximum:	**.90 mg/L**	**0.51 mg/L**	**<2.40 mg/L**	**<1.0 mg/L**	**2.0 Col.**
Permit Limit:	**8 mg/L average**	**2 mg/L average**	**15 mg/L average**	**15 mg/L average**	**10 Col. average**
			23 mg/L MAX	**23 mg/L MAX**	**104 Col. MAX**

- **Maximum daily flow: .8478 MGD**
- **Monthly average flow: .6604 MGD**

II. Activities – April 2020

Lift Stations Activities

- Daily checks on Point Watch system for all pump stations.
- Onsite lift station checks performed April 8-9 and April 23-24.
- 4-2-20 - Installed 3 V-belts on pump #2 at Lift Station #8.

Plant Activities

- 4-2-2020 – Replaced the backflow preventer to booster pump in the headworks building. Began pumping down the EQ for cleaning.
- 4-3-2020 - Switched over to EQ by-pass. Pumped down the rest of EQ tank. BPW personnel cleaned the drain line from sludge drying beds.
- 4-4-2020 – Chesapeake Environmental Services performed onsite cleaning of the EQ tank. Safety briefing held by WMES site safety officer. WMES cleaned grease pit drain removing rags, towels and grease.
- 4-4-2020 - EQ Tank Inspection by Mumford-Bjorkman Associates (MBA) after cleaning was completed. EQ tank back in service at 6:00pm. MBA provided two hard copies of the report. One copy was provided to Darrin Gordon, the second copy filed at the WWTP and an electronic copy was sent to the BPW engineer Scott Getchell with GMB.

- 4-6-2020 – WMES cleaned then re-poured the sludge beds. Maintenance replaced the chlorine pump in the chemical room. CDI removed and hauled away 14,000 gallons of sludge.
- 4-6-20 - Kubota Membrane installation in the digester is underway. Kubota field technician is onsite to facilitate installation with contractor Breakwater.
- 4-9-20 – Kubota Membrane installation on the digester is complete.
- 4-13-2020 – Installed the spare permeate pump on train #3. Sent the removed pump to Hills for inspection and rebuild. Pumped out train #1 for cleaning. Shut off Sussex County flow while trains are rotated offline for cleaning prior to membrane upgrades.
- 4-15-2020 - Drained train #2 for inspection and found most of the sludge pump flange bolts missing. Replaced bolts with stainless steel. Repaired actuator on cyclic valve for train #4. Pulled cassettes A and C from train #2 for inspection and cleaning prior to starting the recovery clean.
- 4-17-2020 - Received delivery of new membranes and parts from Suez. Cleaned diffusers on Kubota membranes in the digester. Called Sussex County and requested flow remain off until membrane upgrades were completed.
- 4-20-2020 - Drained train #4 for contractor to make repairs to the sludge pump flange and piping. Cleaned all four DO probes in ditches 1 and 2.
- 4-21-2020 – Repaired the transfer pump. PLC went out on fault. Reset PLC and put plant back online.
- 4-22-2020 – WMES removed trash and cleaned #2 EQ pump in headworks building.
- 4-23-2020 – Adjusted the new Kubota membranes valves on digesters for wasting.
- 4-24-2020 - Started recovery clean on train #4. Replaced V-belts on the exhaust fans in process building. Ordered a spare pump for the Kubota digester membranes and a replacement pump for the booster pump in the head works building.
- 4-25-2020 – Pumped train #4 to the old EQ tank. As part of membrane replacement project, Breakwater replaced the pipe and flange to sludge pump using stainless bolts.
- 4-26-2020 – WMES weekend operator found a leak on the air compressor. The leak did not affect plant process and repairs were scheduled and completed by WMES maintenance on 4/27/20.
- 4-27-2020 - Replaced 2” solenoid valve to 5MM screen to fix non-potable pump problems.
- 4-28-2020 - Poured beds 1-6. Pulled and cleaned the transducer on the 5MM screen and adjusted. Ordered a new transducer to have on hand as a critical spare part.
- 4/28/20 – Zeeweed Membrane replacement of trains #1 and #3 and cassette hardware replacement for all 4 trains scheduled to begin. Suez Field Support Representative (FSR) was onsite but critical hardware was missing from the Suez factory shipment. WMES requested drawings from Suez during a conference call on 3/26/20 followed by email requests. WMES requested drawings from Suez on a 4/16/20 conference call but were told the FSR would have a copy.
- 4-30-2020 - Atlantic Refrigeration onsite troubleshooting the air dryer in blower room.

SAFETY INFORMATION

- No work place injuries reported. Days without workplace injury: 130
- Performed monthly PPE inspection. No deficiencies noted.
- Performed monthly eyewash station and fire extinguisher inspections. No deficiencies noted.
- Connor Strong Safety Analysis Report & Status Update. (Attached)

Additional Information

- GMB quarterly report from February 18, 2020 inspection was received on April 28, 2020.
- Mumford-Bjorkman (MBA) performed an empty tank inspection on the EQ tank following the tank cleaning on April 4, 2020. The report conclusion from MBA (page 7 in the report) is as follows:
    - "This style tank is not designed for rehabilitation and repair, and is intended for replacement once its 20-25 year service life has elapsed. Given the aggressive service environment, we believe that this tank is nearing the end of its expected service life. The owner should anticipate that vessel replacement will be required within five (5) years, and should begin planning for replacement."

Attachments

- April 2020 Influent and Effluent Report
- April 2020 TMP chart for Kubota Digester Membranes – (New Attachment)
- April 2020 graph of flows vs. rainfall – (New Attachment)
- April 2020 TMP and Permeability charts for Zeeweed Membranes
- April 2020 Membrane Turbidity Trend report
- Sussex County pumpage numbers to Lift Station #4
- April 2020 E-DMR
- April 2020 MLSS Report
- April 2020 WWTP Monthly Operations Report
- April 2020 Nutrient Offset Report
- Corrective Action Items Summary
- Corrective Action Responses – April 2020

LEWES WASTEWATER TREATMENT PLANT

Influent Flow Report

Influent Flow

Time	Flow
4/1/2020	730700
4/2/2020	564000
4/3/2020	548300
4/4/2020	641300
4/5/2020	819300
4/6/2020	814700
4/7/2020	797500
4/8/2020	799700
4/9/2020	796000
4/10/2020	509300
4/11/2020	701600
4/12/2020	749300
4/13/2020	752500
4/14/2020	545900
4/15/2020	550900
4/16/2020	539600
4/17/2020	519600
4/18/2020	498500
4/19/2020	493100
4/20/2020	488100
4/21/2020	588400
4/22/2020	580600
4/23/2020	597600
4/24/2020	725700
4/25/2020	647300
4/26/2020	668900
4/27/2020	640700
4/28/2020	643400
4/29/2020	669200
4/30/2020	668700
Total Flow :	19290400

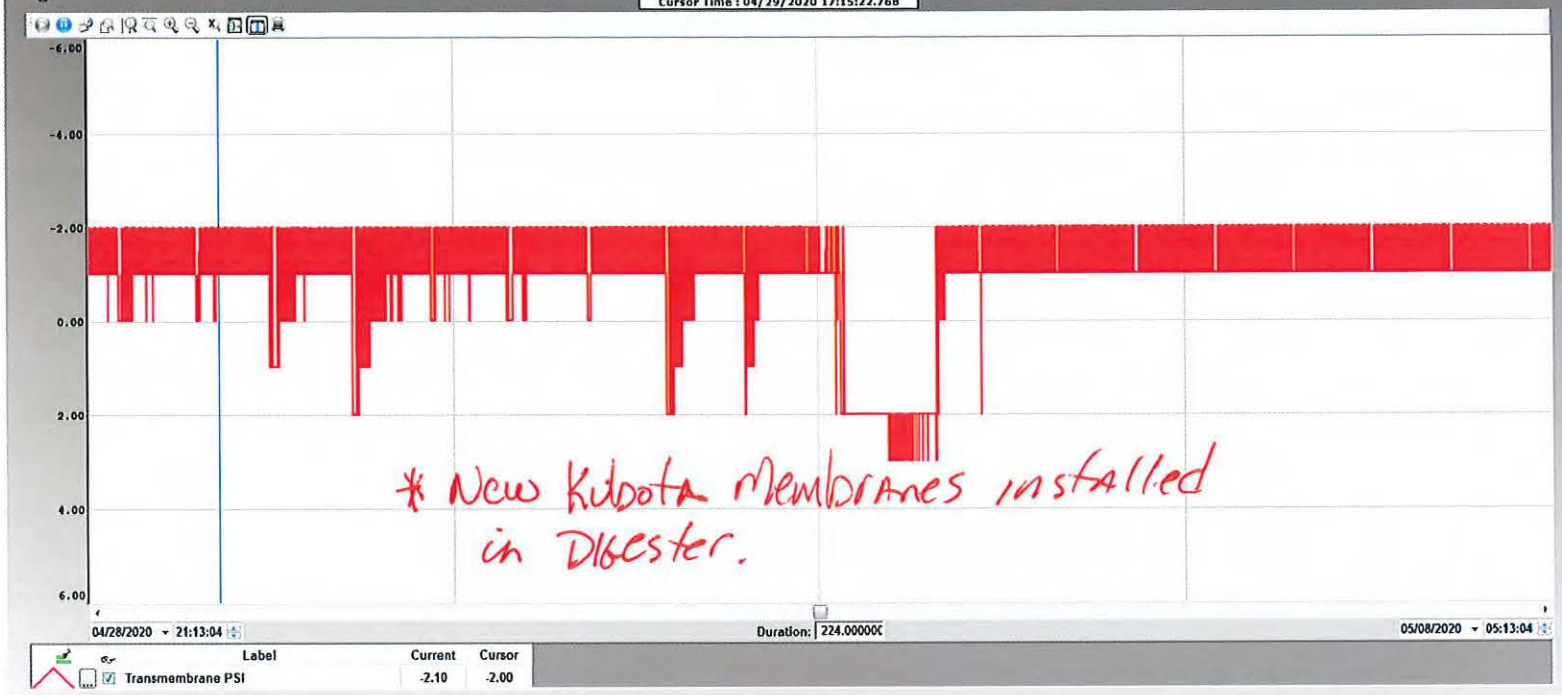
LEWES WASTEWATER TREATMENT PLANT

Effluent Flow Report

Effluent Flow

Time	Flow
4/1/2020	817900
4/2/2020	694600
4/3/2020	592900
4/4/2020	444600
4/5/2020	630200
4/6/2020	808200
4/7/2020	847800
4/8/2020	799400
4/9/2020	713800
4/10/2020	721800
4/11/2020	620000
4/12/2020	734400
4/13/2020	763600
4/14/2020	745500
4/15/2020	408200
4/16/2020	609600
4/17/2020	607600
4/18/2020	568400
4/19/2020	550700
4/20/2020	552200
4/21/2020	538700
4/22/2020	588900
4/23/2020	651000
4/24/2020	638200
4/25/2020	702800
4/26/2020	719200
4/27/2020	719700
4/28/2020	647500
4/29/2020	689300
4/30/2020	683800
Total Flow :	19810500

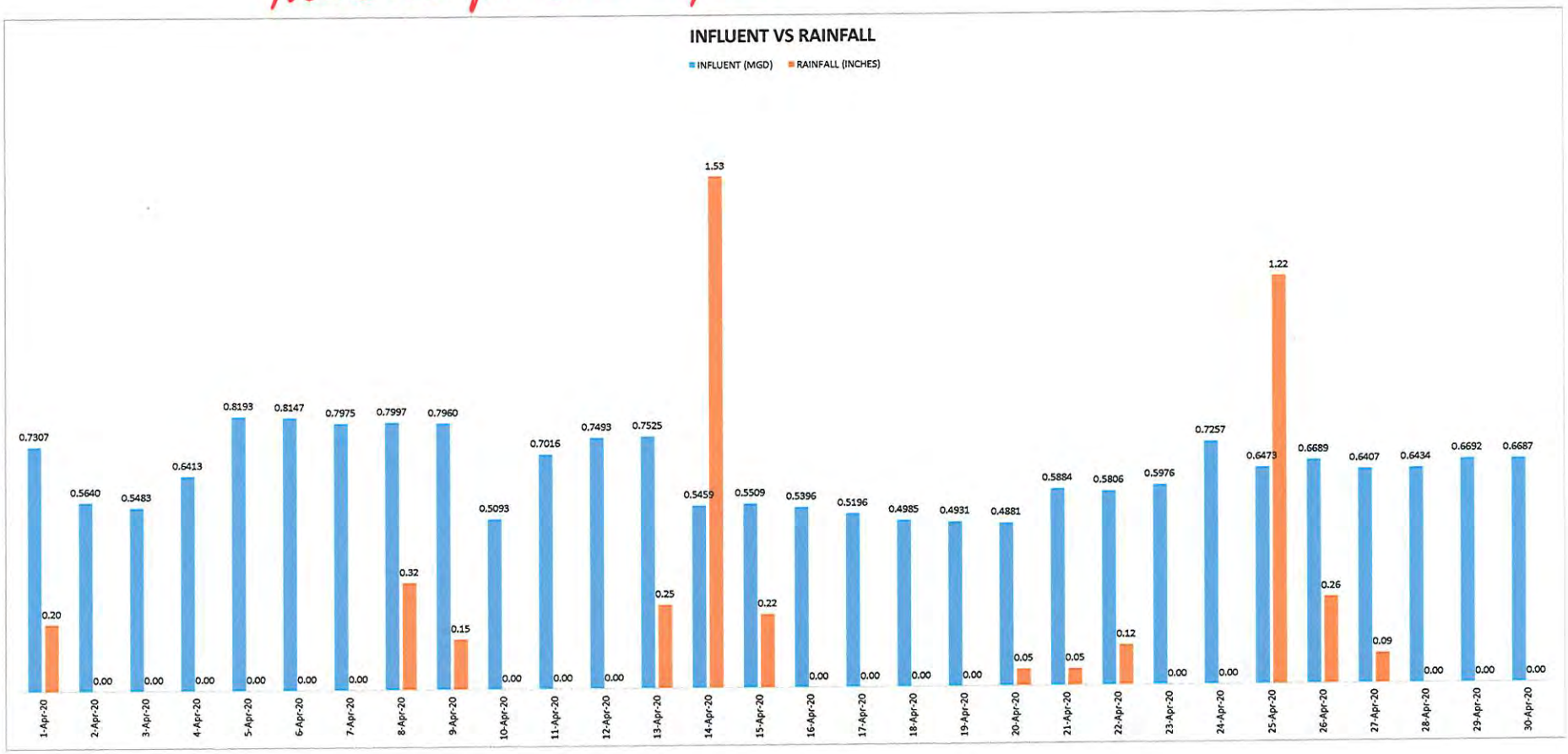
TRANSMEMBRANE PRESSURE



Open Previous | Reset Zoom | Main Menu | Print Trend

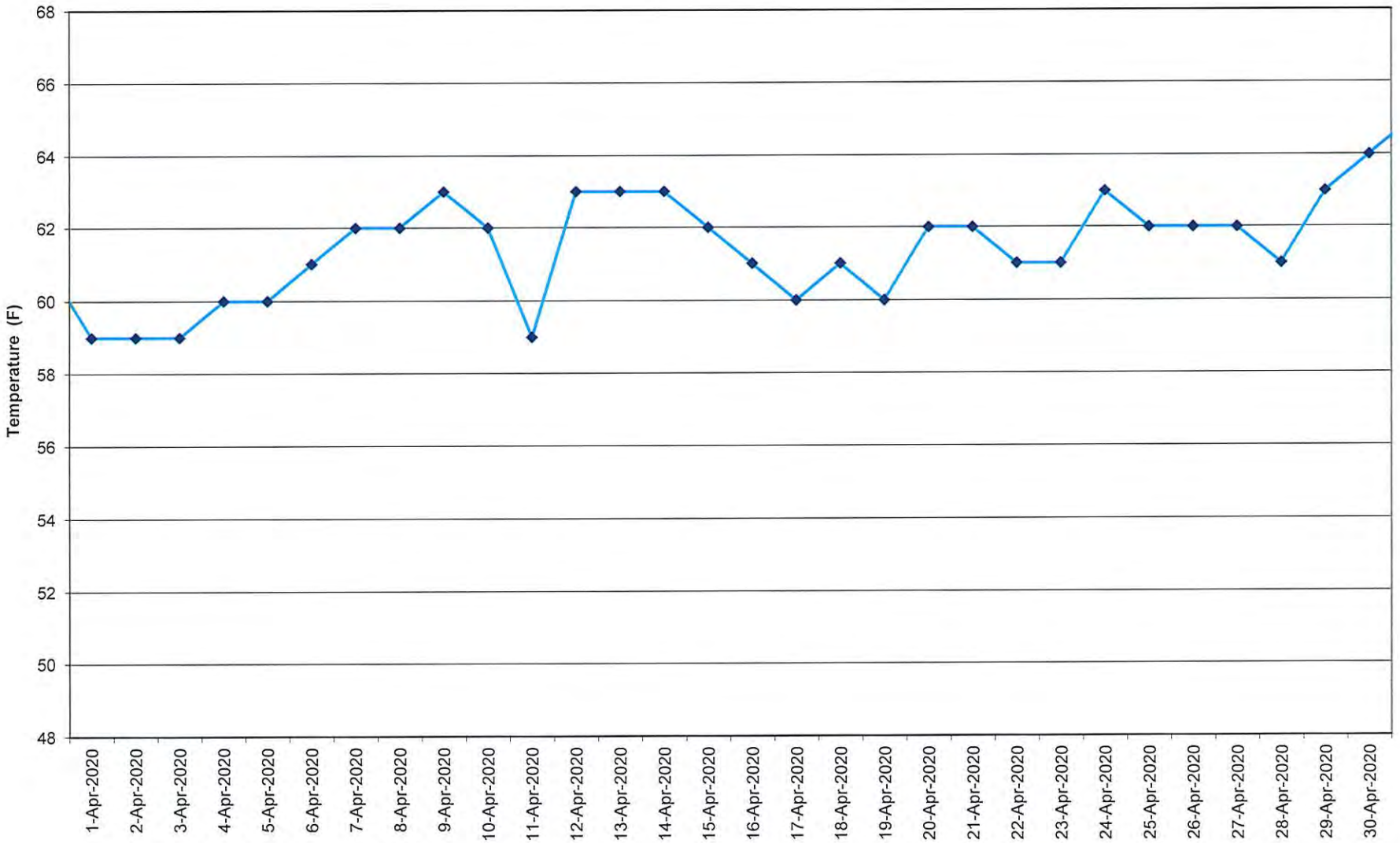
11:53:21
Friday, May 8, 2020
User : Guest
Group : Guest
003 Acknowledged Alarms
000 Unacknowledged Alarms
003 Total Alarms

New Chart per GMB Request



Lewes WWTP

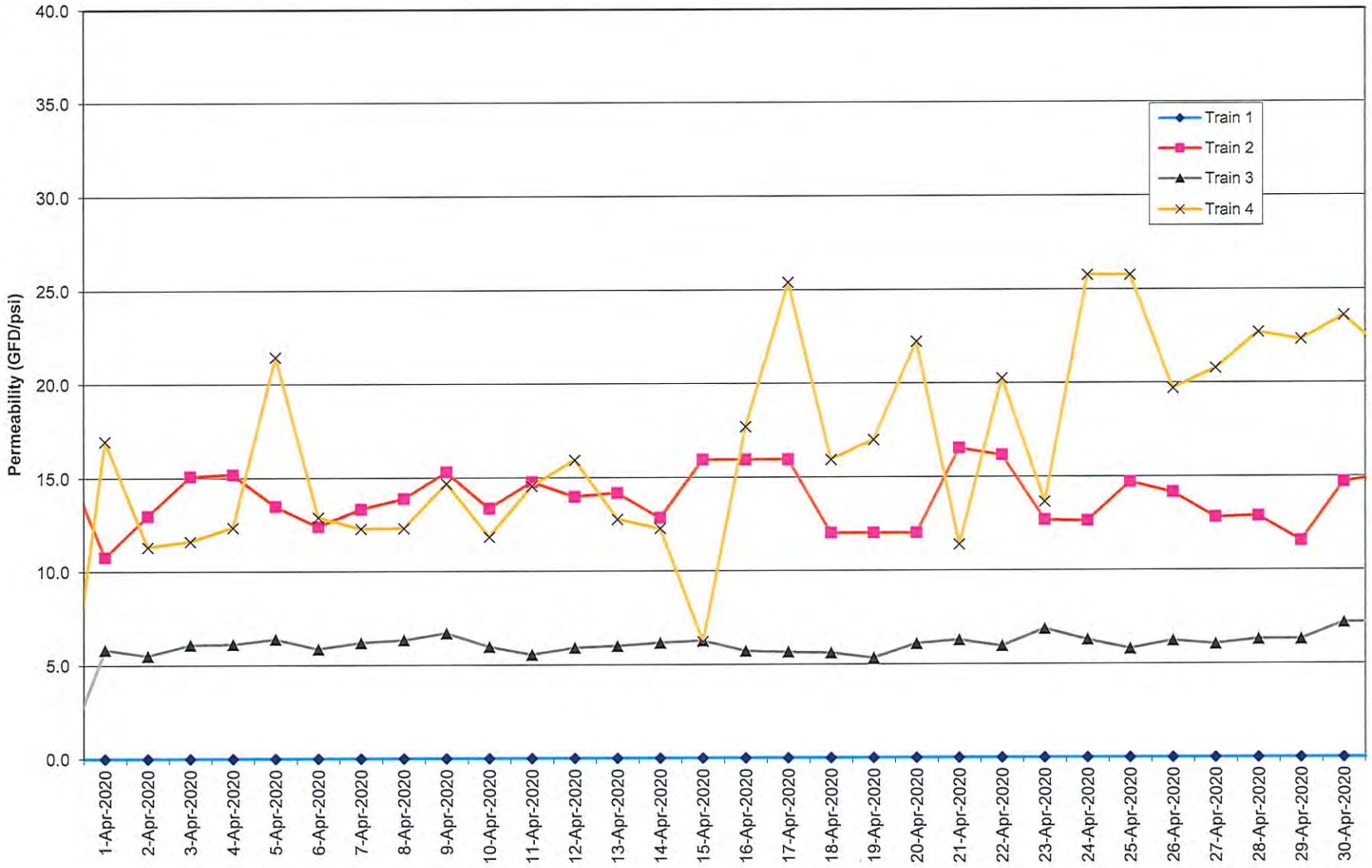
Temperature



5/11/2020

Lewes WWTP

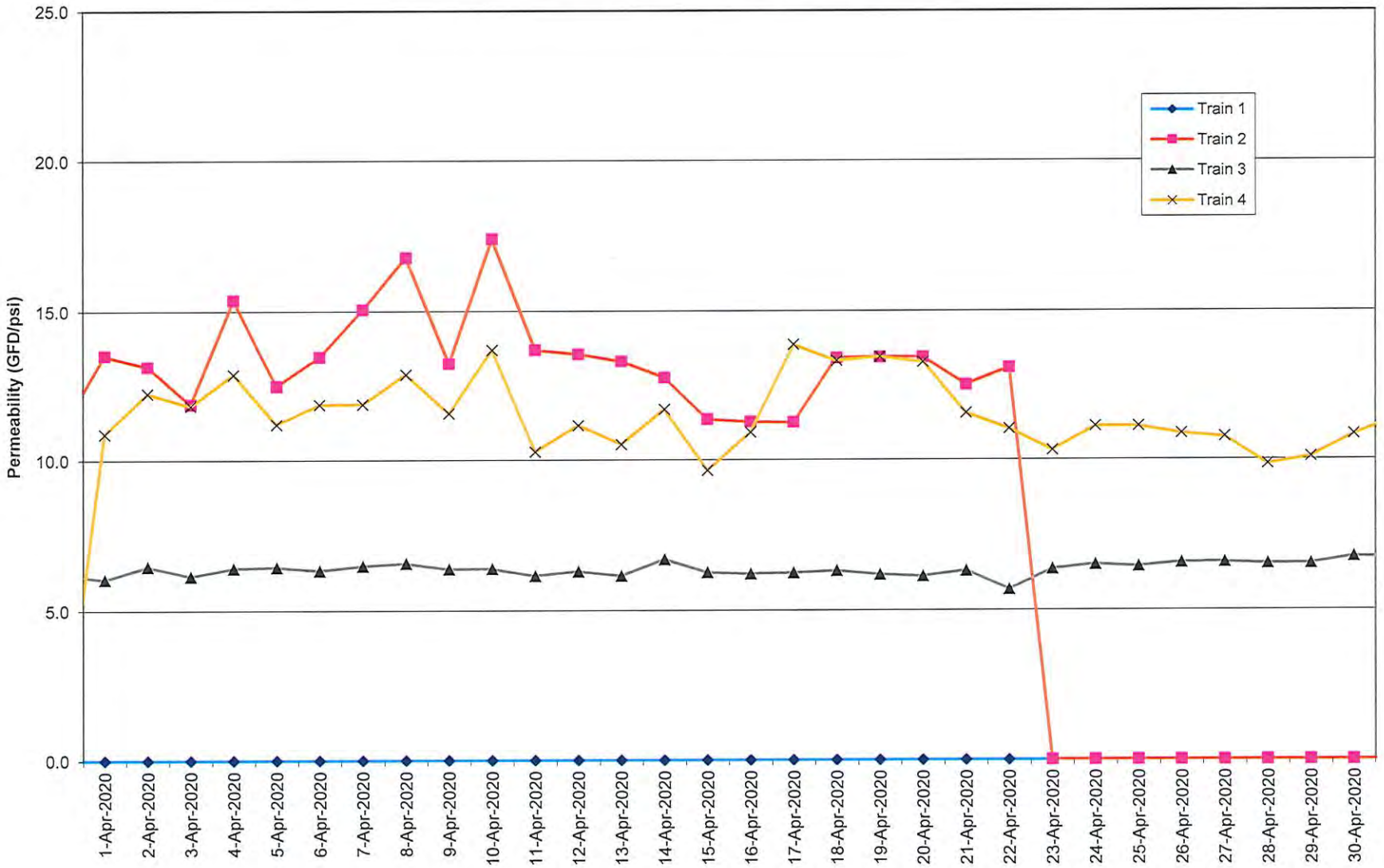
Permeability Before Backpulse vs. time



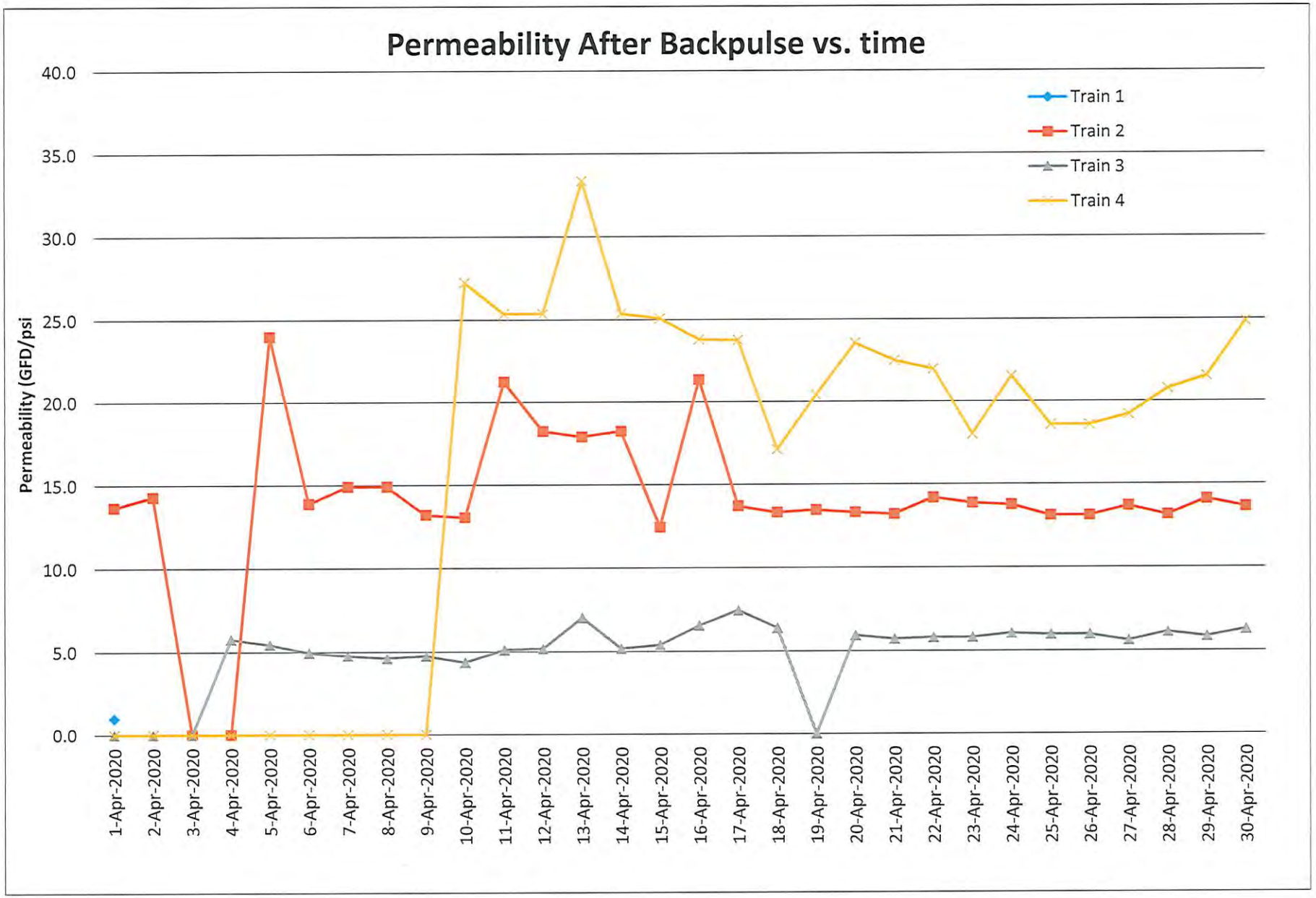
5/11/2020

Lewes WWTP

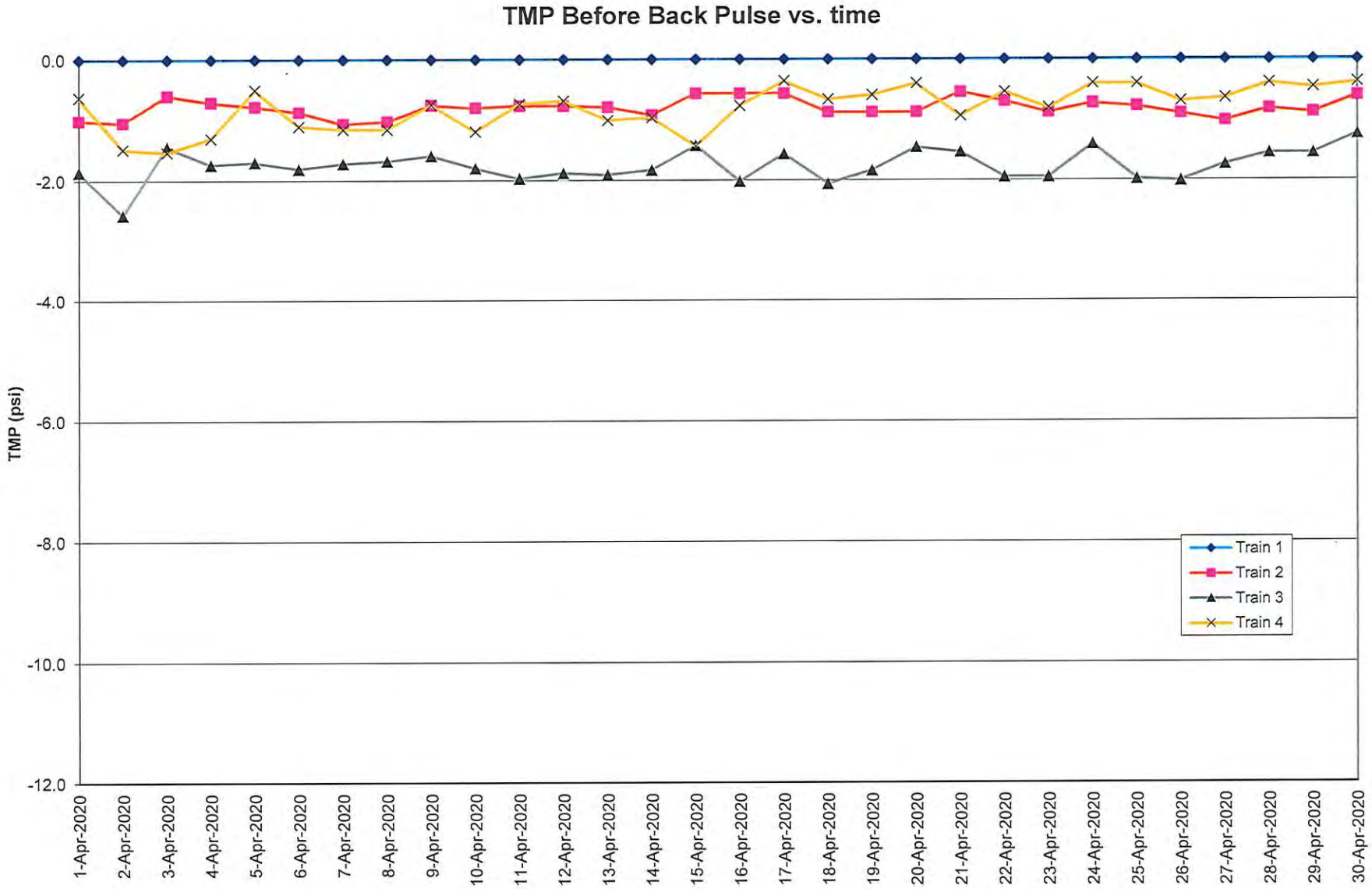
Permeability During Backpulse vs. time



5/11/2020


Permeability After Backpulse vs. time
Permeability (GFD/psi
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Train 1
Train 2
Train 3
Train 4
1-Apr-2020
2-Apr-2020
3-Apr-2020
4-Apr-2020
5-Apr-2020
6-Apr-2020
7-Apr-2020
8-Apr-2020
9-Apr-2020
10-Apr-2020
11-Apr-2020
12-Apr-2020
13-Apr-2020
14-Apr-2020
15-Apr-2020
16-Apr-2020
17-Apr-2020
18-Apr-2020
19-Apr-2020
20-Apr-2020
21-Apr-2020
22-Apr-2020
23-Apr-2020
24-Apr-2020
25-Apr-2020
26-Apr-2020
27-Apr-2020
28-Apr-2020
29-Apr-2020
30-Apr-2020

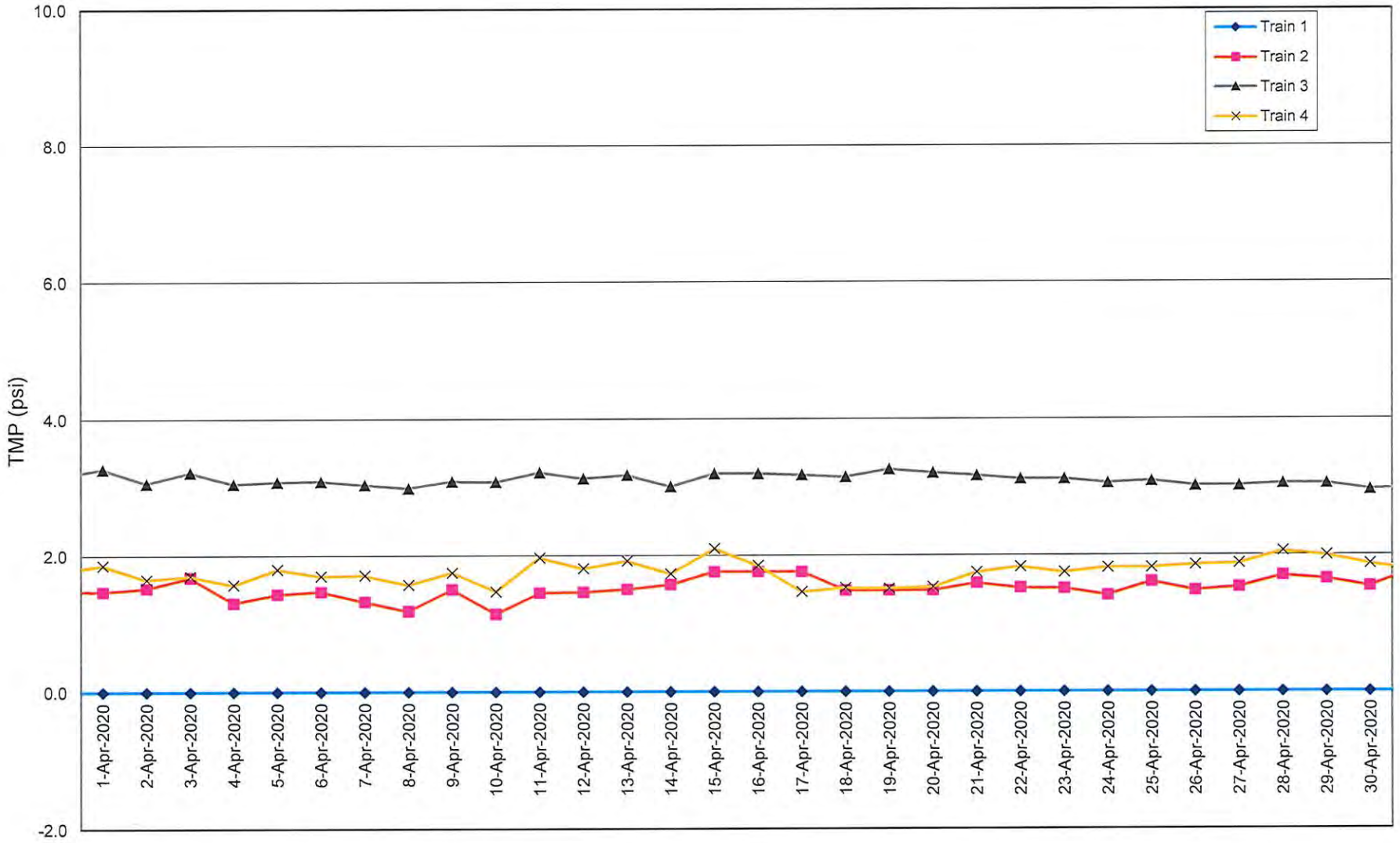
Lewes WWTP



5/11/2020

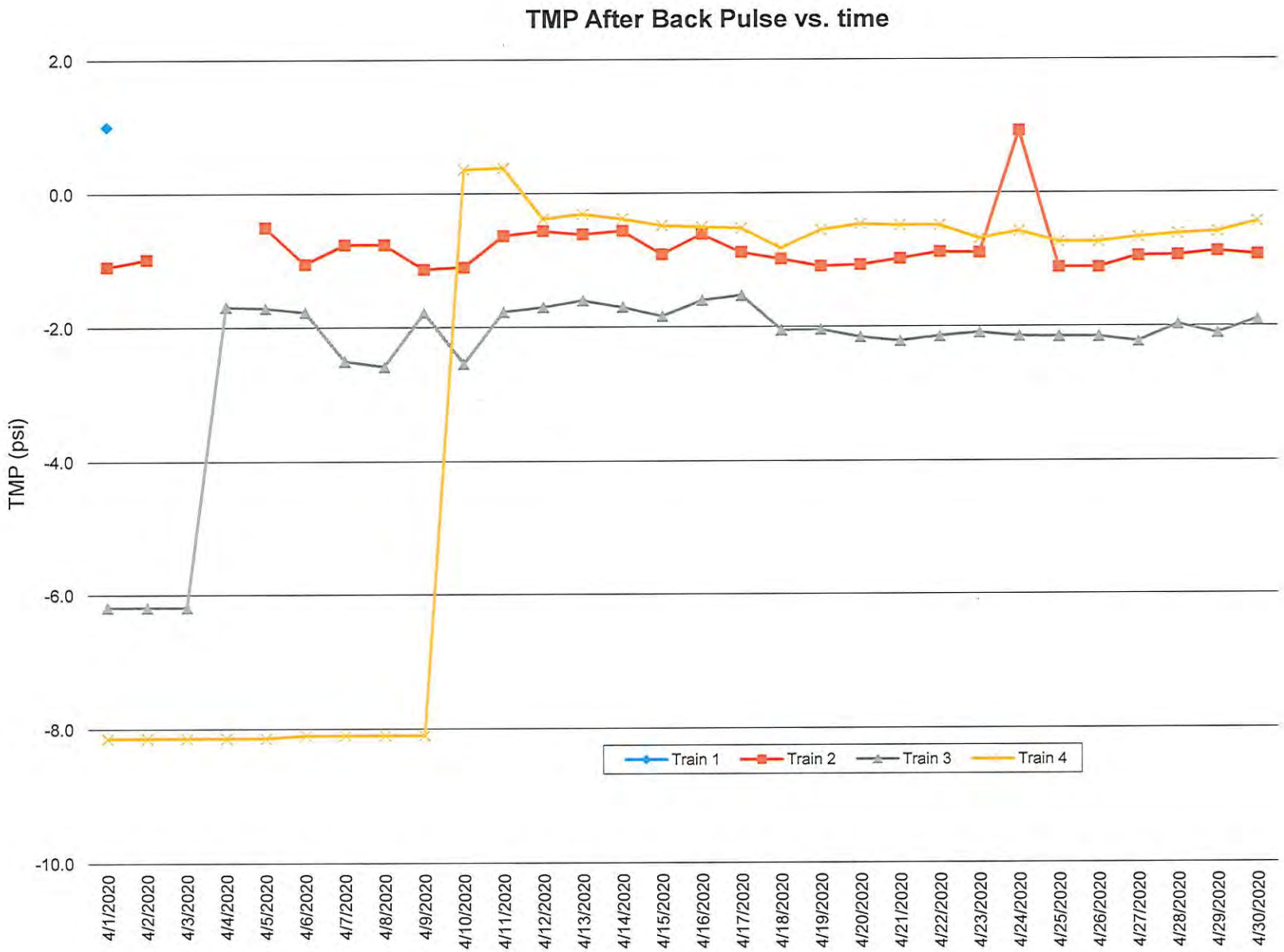
Lewes WWTP

TMP During Back Pulse vs. time



5/11/2020

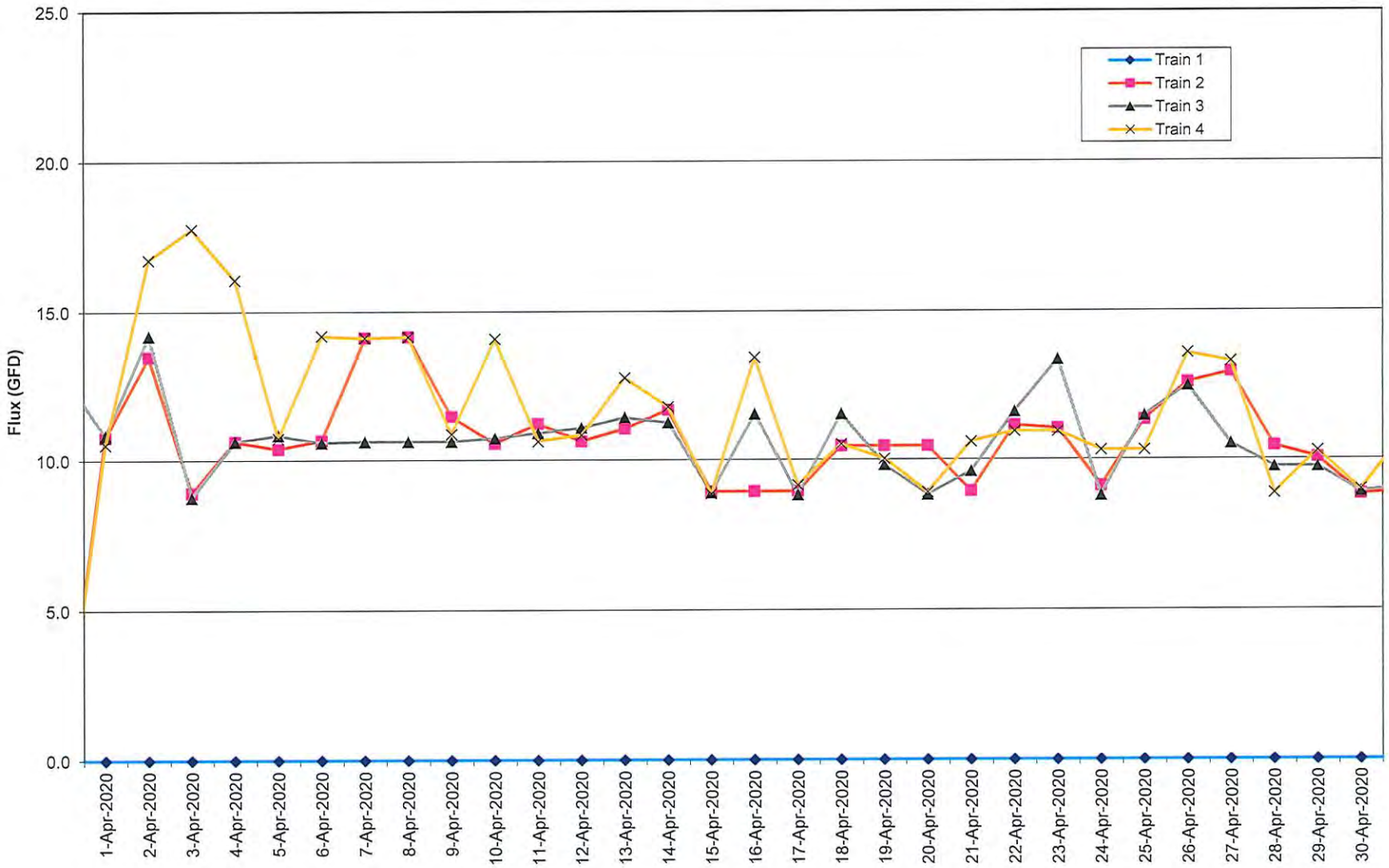
Lewes WWTP



5/11/2020

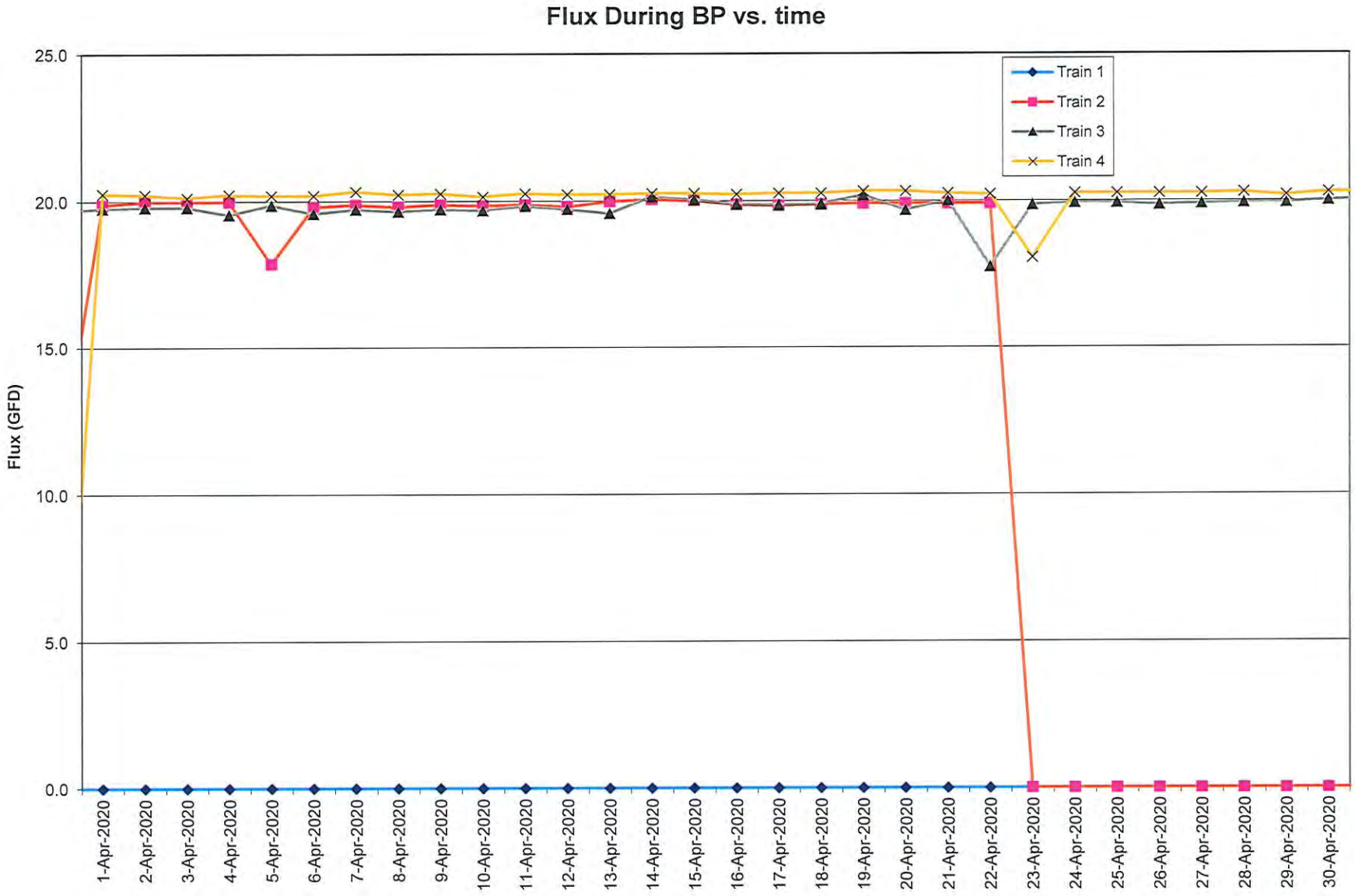
Lewes WWTP

Flux Before BP vs. time



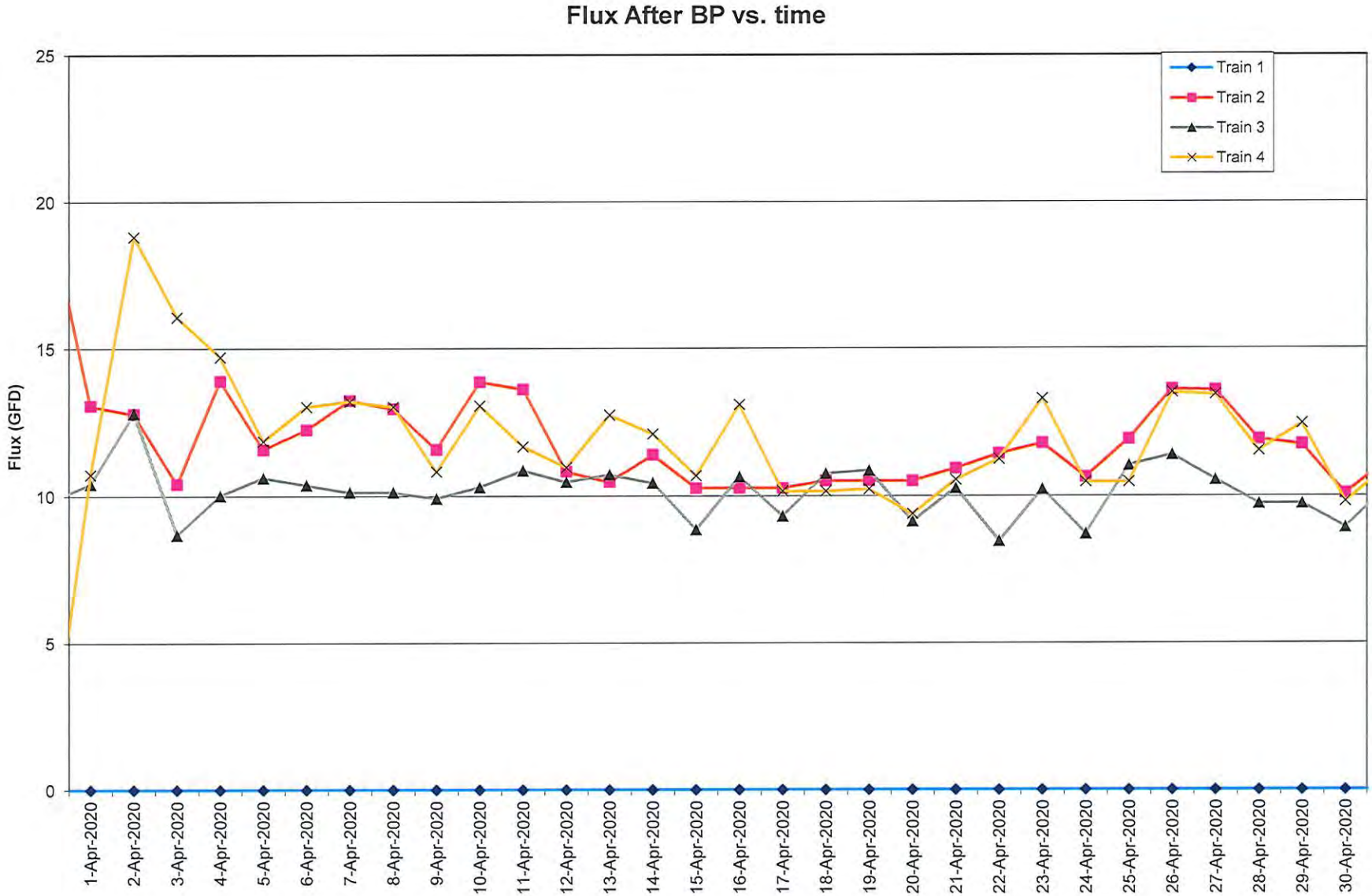
5/11/2020

Lewes WWTP

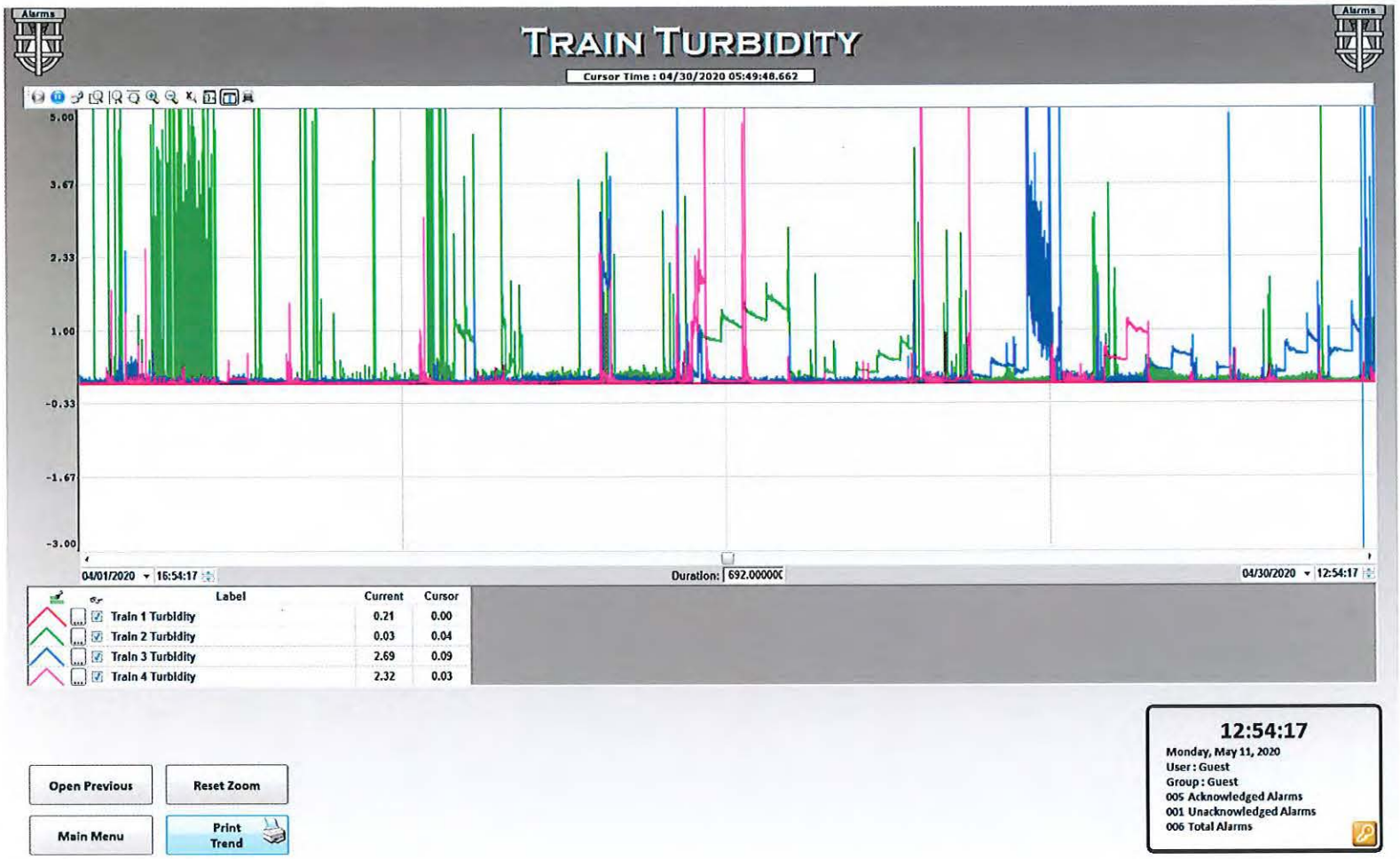


5/11/2020

Lewes WWTP



5/11/2020



* Train turbidity spikes in APRIL are due to the following:

1. Air leaks in trains # 2, 3, 4. Leaks are being Addressed during Rehab project.
2. On going work on each train during the draining and Cleaning process.
   - Piping Connected to the Sludge pumps in All 4 trains was inspected for leaks and Repaired.

PUMP STATION 196

Apr-20		PS 196		
		METER READING	24 HOUR FLOW	
WED	1	37940290	0.207620	Flow to WN
THUR	2	38147910	0.108650	
FRI	3	38256560	0.111800	
SAT	4	38368360	0.163080	
SUN	5	38531440	0.294420	
MON	6	38825860	0.292240	
TUE	7	39118100	0.290880	
WED	8	39408980	0.291600	
THUR	9	39700580	0.294440	
FRI	10	39995020	0.119060	
SAT	11	40114080	0.257390	
SUN	12	40371470	0.285590	
MON	13	40657060	0.181560	Flow to WN
TUE	14	40838620	0.111880	
WED	15	40950500	0.113920	
THUR	16	41064420	0.107980	
FRI	17	41172400	0.109540	
SAT	18	41281940	0.114570	
SUN	19	41396510	0.117250	
MON	20	41513760	0.112270	Flow to Lewes
TUE	21	41626030	0.106470	
WED	22	41732500	0.110250	
THUR	23	41842750	0.116130	
FRI	24	41958880	0.120200	
SAT	25	42079080	0.116780	
SUN	26	42195860	0.117130	
MON	27	42312990	0.112700	
TUE	28	42425690	0.110670	
WED	29	42536360	0.113400	
THUR	30	42649760	0.112380	
		42762140		
TOTAL			4.821850	
COUNT			30	
AVERAGE			0.160728	
MINIMUM			0.106470	
MAXIMUM			0.294440	

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

DISCHARGE MONITORING REPORT (DMR)

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

DE0021512 — PERMIT NUMBER

001 — DISCHARGE NUMBER

MONITORING PERIOD FROM 2020 04 01 TO 2020 04 30

REPORT DESIGNATOR	A
DATA ENTRY COMPLETE	5/8/2020
REPORT SUBMITTED BY	daveweed69
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		**0.6604**	**0.8478**	**Mil Gal/Day**				**--**	**0**	**99/99**	**RCOTOT**
	Gross Effluent (50050)	PERMIT REQUIREMENT	-	No Limit | Monitoring Reqd	No Limit | Monitoring Reqd	Mil Gal/Day	No Monitoring Required	No Monitoring Required	No Monitoring Required	--	--	99/99	RCOTOT
1/2	Dissolved oxygen (DO)	SAMPLE MEASUREMENT				--	**2.89**		**6.74**	**mg/l**	**0**	**99/99**	**Imersion**
	Gross Effluent (00300)	PERMIT REQUIREMENT	-	No Monitoring Required	No Monitoring Required	--	No Limit | Monitoring Reqd	No Monitoring Required	No Limit | Monitoring Reqd	mg/l	--	99/99	Imersion
1/3	pH	SAMPLE MEASUREMENT				--	**7.5**		**7.7**	**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		**<13.91**	**<16.97**	**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				--		**86.73**	**113**	**mg/l**	**0**	**01/07**	**Composite 24**
	Raw Sewage (00310)	PERMIT REQUIREMENT	-	No Monitoring Required	No Monitoring Required	--	No Monitoring Required	No Limit | Monitoring Reqd	No Limit | Monitoring Reqd	mg/l	--	01/30	Composite 24
1/7	TSS	SAMPLE MEASUREMENT		**<4.21**	**<6.22**	**lbs/Day**		**<0.7**	**<1**	**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

TYPED OR PRINTED

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]

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

TELEPHONE

DATE (YEAR / MO / DAY)

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)

DISCHARGE MONITORING REPORT (DMR)

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

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MONITORING PERIOD FROM 2020 04 01 TO 2020 04 30

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DATA ENTRY COMPLETE	5/8/2020
REPORT SUBMITTED BY	daveweed69
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			
2/1	TSS	SAMPLE MEASUREMENT				--		72	140	mg/l	0	01/07	Composite 24
	Raw Sewage (00530)	PERMIT REQUIREMENT	-	No Monitoring Required	No Monitoring Required	--	No Monitoring Required	No Limit | Monitoring Reqd	No Limit | Monitoring Reqd	mg/l	--	01/30	Composite 24
2/2	Total Nitrogen	SAMPLE MEASUREMENT		5.6	5.6	lbs/Day		0.9	0.9	mg/l	0	01/30	Composite 24
	Gross Effluent (00600)	PERMIT REQUIREMENT	-	100	No Limit | Monitoring Reqd	lbs/Day	No Monitoring Required	8	No Limit | Monitoring Reqd	mg/l	--	01/30	Composite 24
2/3	Phosphorus, Total	SAMPLE MEASUREMENT		3.17	3.17	lbs/Day		0.51	0.51	mg/l	0	01/30	Composite 24
	Gross Effluent (00665)	PERMIT REQUIREMENT	-	25	No Limit | Monitoring Reqd	lbs/Day	No Monitoring Required	2	No Limit | Monitoring Reqd	mg/l	--	01/30	Composite 24

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

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[ATTACH DIGITAL SIGNATURE RECEIPT FROM CROMERR]

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

TELEPHONE

DATE YEAR MO DAY

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)

Submission Receipt

Copy of Record: 53205 Confirmation ID: d20205853205

Site: Howard Seymour Water Reclamation Plant Site ID: DE0021512

Submission: Discharge Monitoring Report for DE0021512 Howard Seymour Water Reclamation Plant Outfall: 001, April, 2020

File Name: 20204-2347-60749445 File Type: .pdf

Report: DMR Status: Signed

Hash of Data Document:
2b4a4e63e75666288ab9160087e80c0609f9c74cffe99a10dbd4cb3abd36a04d

Data Entry Completed: 5/8/2020 8:54 AM By: David Weed (daveweed69)

EMail of Submittor: dweed@tuiwater.com From: 208.87.236.201

Signed: 5/8/2020 8:58 AM By: David Weed (daveweed69)

EMail of Signator: dweed@tuiwater.com From: 208.87.236.201

Token Used When Signed: YzX4qMoLnCmwZMb30wjwMDH1tQ2WASkdCJxxO5eY17g=

SUSPENDED SOLIDS BENCH SHEET

Date	4/2/2020	Analyst	DBW	Sample Time	11:15
Oven, °C	103	Time In	11:40	Time Out	12:40
Furnace, °C	550	Time In		Time Out	

Sample ID	Blank	Digester 1	Dig. Dup	D.O. 1B	D.O. 2B
Pan No.	0	2 1	3 2	4 3	5 4
Volume, mL	100	10	10	10	10
Dry Wt, g	0.	0. 6162	0. 6160	0. 5452	0. 5438
Initial Wt, g	0.	0. 0.4005	0. 0.4008	0. 0.4023	0. 0.4039
Net Wt, g	0.	0. 2157	0. 2152	0. 1429	0. 1399
TSS, mg/L		21570	21520	14290	13990
Dry Wt, g	0.	0.	0.	0.	0.
Ash Wt, g	0.	0.	0.	0.	0.
Net Wt, g	0.	0.	0.	0.	0.
3/25 VSS, mg/L	0.	0. 21750	0. 21740	0. 14430	0. 13850
Volatile, %					

TSS, mg/L Avg.				
VSS, mg/L Avg.				
Volatile, % Avg.				

Running?Y__N__ Running?Y__N__ Running?Y__N__ Running?Y__N__

Sample ID	Zeeweed 1	Zeeweed 2	Zeeweed 3	Zeeweed 4	Membrane permeate
Pan No.	1	2 8	3 6	4 7	5
Volume, mL	10	10	10	10	10
Dry Wt, g	0.	0. 5614	0. 5633	0. 5645	0.
Initial Wt, g	0.	0. 0.4020	0. 0.3998	0. 0.3935	0.
Net Wt, g	0.	0. 1594	0. 1635	0. 1710	0.
TSS, mg/L		15940	16350	17100	
Dry Wt, g	0.	0.	0.	0.	0.
Ash Wt, g	0.	0.	0.	0.	0.
Net Wt, g	0.	0.	0.	0.	0.
3/25 VSS, mg/L	0.	0. 13890	0. 15400	0. 16450	0.
Volatile, %					

TSS, mg/L Avg.				
VSS, mg/L Avg.				
Volatile, % Avg.				

HAHD

SUSPENDED SOLIDS BENCH SHEET

HELD

Date	4/8/2020	Analyst	DSW	Sample Time	14:20
Oven, °C	103	Time In		Time Out	
Furnace, °C	550	Time In		Time Out	

Sample ID	Blank	Digester 1	Dig. Dup	D.O. 1B	D.O. 2B
Pan No.	1	2	3	4	5
Volume, mL	100	10	10	10	10
Dry Wt, g	0.	0.	0.	0.	0.
Initial Wt, g	0.	0.	0.	0.	0.
Net Wt, g	0.	0. 16,210	0. 16,180	0. 12,990	0. 12,970
TSS, mg/L					
2/13 HH Dry Wt, g	0.	0. 16207	0. 16151	0. 11761	0. 11615
Ash Wt, g	0.	0.	0.	0.	0.
4/2 Net Wt, g	0.	0. 21570	0. 21520	0. 14290	0. 13990
VSS, mg/L	0.	0.	0.	0.	0.
Volatile, %					

TSS, mg/L Avg.				
VSS, mg/L Avg.				
Volatile, % Avg.				

Running?Y__N__ Running?Y__N__ Running?Y__N__ Running?Y__N__

Sample ID	Zeeweed 1	Zeeweed 2	Zeeweed 3	Zeeweed 4	Membrane permeate
Pan No.	1	2	3	4	5
Volume, mL	10	10	10	10	10
Dry Wt, g	0.	0.	0.	0.	0.
Initial Wt, g	0.	0.	0.	0.	0.
Net Wt, g	0.	0. 13,500	0. 13,530	0. 14,655	0. N/A
1/17 TSS, mg/L					
2/13 Dry Wt, g	0.	0. 12333	0. 12149	0. 11642	0.
Ash Wt, g	0.	0.	0.	0.	0.
4/2 Net Wt, g	0.	0. 15940	0. 16350	0. 17100	0.
VSS, mg/L	0.	0.	0.	0.	0.
Volatile, %					

TSS, mg/L Avg.				
VSS, mg/L Avg.				
Volatile, % Avg.				

SUSPENDED SOLIDS BENCH SHEET

Date 4/15/2020		Analyst	DMW	Sample Time	0945
Oven, °C	103	Time In	0820	Time Out	0920
Furnace, °C	550	Time In		Time Out	

Sample ID	Blank	Digester 1	Dig. Dup	D.O. 1B	D.O. 2B
Pan No.	1	2	3	4	5
Volume, mL	100	10	10	10	10
Dry Wt, g	0.	0. 6528	0. 6575	0. 5543	0. 5385
Initial Wt, g	0.	0. 3979	0. 3998	0. 3972	0. 3955
Net Wt, g	0.	0. 2549	0. 2577	0. 1571	0. 1430
TSS, mg/L		25490	25770	15710	14300
Dry Wt, g	0.	0.	0.	0.	0.
Ash Wt, g	0.	0.	0.	0.	0.
Net Wt, g	0.	0.	0.	0.	0.
4/8 VSS, mg/L	0. HH	0. 16210	0. 16180	0. 12990	0. 12970
Volatile, %					

TSS, mg/L Avg.				
VSS, mg/L Avg.				
Volatile, % Avg.				

Running?Y__N__ Running?Y__N__ Running?Y__N__ Running?Y__N__

Sample ID	Zeeweed 1	Zeeweed 2	Zeeweed 3	Zeeweed 4	Membrane permeate
Pan No.	1	2	3	4	5
Volume, mL	10	10	10	10	10
Dry Wt, g	0.	0.	0. 5600	0. 5583	0. 3961
Initial Wt, g	0. 0	0. 0	0. 3979	0. 3944	0. 3958
Net Wt, g	0.	0.	0. 1621	0. 1639	0. 3
TSS, mg/L	F	F	16210	16390	30
Dry Wt, g	0.	0.	0.	0.	0.
Ash Wt, g	0.	0.	0.	0.	0.
Net Wt, g	0. F	0. F	0.	0.	0.
4/8 VSS, mg/L	0. HH	0.	0. 13530	0. 14655	0. N/A
Volatile, %					

TSS, mg/L Avg.				
VSS, mg/L Avg.				
Volatile, % Avg.				

SUSPENDED SOLIDS BENCH SHEET

Date	4/23/2020	Analyst	DBW	Sample Time	12:15
Oven, °C	103	Time In	1230	Time Out	1335
Furnace, °C	550	Time In		Time Out	

Sample ID	Blank	Digester 1	Dig. Dup	D.O. 1B	D.O. 2B
Pan No.	1	2	3	4	5
Volume, mL	100	10	10	10	10
Dry Wt, g	0.	0. 6970	0. 6812	0. 5198	0. 5197
Initial Wt, g	0.	0. 3910	0. 3905	0. 3915	0. 3875
Net Wt, g	0.	0. 3060	0. 2907	0. 1283	0. 1322
TSS, mg/L		30600	29070	12830	13220
Dry Wt, g	0.	0.	0.	0.	0.
Ash Wt, g	0.	0.	0.	0.	0.
Net Wt, g	0.	0.	0.	0.	0.
VSS, mg/L	0.	0.	0.	0.	0.
Volatile, %					

TSS, mg/L Avg.				
VSS, mg/L Avg.				
Volatile, % Avg.				

Sample ID	Running?Y__N__ Zeeweed 1	Running?Y__N__ Zeeweed 2	Running?Y__N__ Zeeweed 3	Running?Y__N__ Zeeweed 4	Membrane permeate
Pan No.	1	2	3	4	5
Volume, mL	10	10	10	10	10
Dry Wt, g	0.	0. 5359	0. 5259	0. 5563	0. 3941
Initial Wt, g	0.	0. 3892	0. 3901	0. 3909	0. 3938
Net Wt, g	0.	0. 1467	0. 1358	0. 1654	0. 3
TSS, mg/L		14670	13580	16540	30
Dry Wt, g	0.	0.	0.	0.	0.
Ash Wt, g	0.	0.	0.	0.	0.
Net Wt, g	0.	0.	0.	0.	0.
VSS, mg/L	0.	0.	0.	0.	0.
Volatile, %					

TSS, mg/L Avg.				
VSS, mg/L Avg.				
Volatile, % Avg.				

SUSPENDED SOLIDS BENCH SHEET

Date	4/29/2020	Analyst	DBW	Sample Time	8:00
Oven, °C	103	Time In	0844	Time Out	9:45
Furnace, °C	550	Time In		Time Out	

Sample ID	Blank	Digester 1	Dig. Dup	D.O. 1B	D.O. 2B
Pan No.	1	2	3	4	5
Volume, mL	100	10	10	10	10
Dry Wt, g	0.	0. 6832	0. 6838	0. 5205	0. 5227
Initial Wt, g	0.	0. 3913	0. 3955	0. 3946	0. 3948
Net Wt, g	0.	0. 2919	0. 2883	0. 1259	0. 1279
TSS, mg/L		29,190	28830	12590	12790
Dry Wt, g	0.	0.	0.	0.	0.
Ash Wt, g	0.	0.	0.	0.	0.
Net Wt, g	0.	0.	0.	0.	0.
4/23 VSS, mg/L	0.	0. 30600	0. 29070	0. 12830	0. 13220
Volatile, %					

TSS, mg/L Avg.				
VSS, mg/L Avg.				
Volatile, % Avg.				

Running?Y__N__ Running?Y__N__ Running?Y__N__ Running?Y__N__

Sample ID	Zeeweed 2	Zeeweed 3	Zeeweed 4	Zeeweed 4	Membrane permeate
Pan No.	2	3	4	4	5
Volume, mL	10	10	10	10	10
Dry Wt, g	0. 5419	0. 5339	0. 5479	0.	0. 3958
Initial Wt, g	0. 3975	0. 3963	0. 3949	0.	0. 3958
Net Wt, g	0. 1444	0. 1376	0. 1530	0.	0.
TSS, mg/L	14440	13760	15300		0
Dry Wt, g	0.	0.	0.	0.	0.
Ash Wt, g	0.	0.	0.	0.	0.
Net Wt, g	0.	0.	0.	0.	0.
4/23 VSS, mg/L	0. 14670	0. 13580	0. 16540	0.	0. 30
Volatile, %					

TSS, mg/L Avg.				
VSS, mg/L Avg.				
Volatile, % Avg.				

MONTHLY OPERATIONS REPORT

Tidewater Utilities

SITE: LEWES WWTF **APRIL** **0:00**

GENERAL INFORMATION					FINAL EFFLUENT OUTFALL OO1 Dup Samples 1 per week							
		AIR	Prec		EFF FLOW	pH	p.H	D.O.,	TEMP.	SAMPLE		TEST
DATE	DAY	deg F	in,	WEATHER	MGD	S.U.	DUP	mg/l	deg C	TIME	INITIALS	TIME
1	w	43	0.20	rain	0.8179	7.73		4.89	15.9	7:50	JT	8:00
2	t	43	t	clear	0.6946	7.65		4.38	16.8	8:40	JT	8:47
3	f	50	0.00	clear	0.5929	7.57		5.14	17.1	7:20	DBW	7:31
4	s	41	t	cloudy	0.4446	7.65		5.32	17.4	7:55	DBW	8:04
5	s	58	0.00	clear	0.6302	7.55		5.28	18.8	12:04	DBW	12:14
6	m	52	0.00	cloudy	0.8082	7.60	7.6	4.13	19.2	8:55	JT	9:05
7	t	51	0.00	cloudy	0.8478	7.51		3.88	17.7	7:42	DBW	7:51
8	w	0	0.32	rain	0.7994	7.58		3.51	18.3	8:15	DBW	8:29
9	t	55	0.15	cloudy	0.7138	7.63		3.40	18.4	7:30	JT	7:38
10	f	40	0.00	clear	0.7218	7.53		2.89	18.0	10:05	DBW	10:16
11	s	46	0.00	clear	0.6200	7.51		4.27	16.9	9:53	GL	10:04
12	s	51	0.00	clear	0.7344	7.48		4.38	18.2	10:52	GL	11:05
13	m	61	?	rain	0.7636	7.47	7.47	3.18	18.3	7:40	JT	7:46
14	t	48	1.53	clear	0.7455	7.55		3.94	18.3	8:05	DBW	8:12
15	w	38	0.22	rain	0.4082	7.47		3.58	17.9	8:06	DBW	8:17
16	t	43	0.00	clear	0.6096	7.57		3.43	17.5	8:05	JT	8:15
17	f	30	0.00	clear	0.6076	7.65		3.80	17.0	8:15	JT	8:25
18	s	49	0.00	cloudy	0.5684	7.61		4.74	17.6	15:40	RLG	15:45
19	s	47	0.00	clear	0.5507	7.67		5.19	17.0	10:45	DBW	10:47
20	m	52	0.05	cloudy	0.5522	7.63	7.64	5.40	18.2	8:10	JT	8:15
21	t	48	0.05	clear	0.5387	7.62		6.02	18.1	8:00	JT	8:06
22	w	39	0.12	clear	0.5889	7.62		6.00	17.3	8:35	JT	8:44
23	t	48	0.00	clear	0.6510	7.70		5.69	17.9	8:58	DBW	9:13
24	f	54	0.00	rain	0.6382	7.61		5.87	18.7	8:15	JT	8:25
25	s	48	1.22	clear	0.7028	7.63		5.18	18.4	8:10	DBW	8:17
26	s	54	0.26	rain	0.7192	7.51		5.72	17.0	10:25	JGL	10:38
27	m	46	0.09	rain	0.7197	7.62	7.6	5.83	16.6	7:45	JT	7:51
28	t	46	0.00	clear	0.6475	7.61		6.74	17.7	7:40	JT	7:47
29	w	55	0.00	clear	0.6893	7.64		6.39	18.8	7:45	JT	7:50
30	t	68	t	cloudy	0.6838	7.62		6.36	19.0	8:35	DBW	8:41
31												
TOTAL			**4.21**		**19.8105**							
AVERAGE		**47**	**0.16**		**0.6604**	*	*	**4.82**	**17.8**			
MAXIMUM		**68**	**1.53**		**0.8478**	**7.7**	*	**6.74**	**19.2**			
MINIMUM		**0**	**0.00**		**0.4082**	**7.5**	*	**2.89**	**15.90**			

MONTHLY OPERATIONS REPORT

Tidewater Utilities

SITE: LEWES WWTF **APRIL 2020**

		FINAL EFFLUENT OUTFALL OO1																					
		BOD5			TSS			ENTEROC.		TOTAL P		TOTAL N		AMMONIA AS N		NITRATE+NITRITE AS N		TKN	
DATE	DAY	mg/l		lbs/day	mg/l		lbs/day	Col/100 ml	Logarithm	mg/l	lbs/day	mg/l	lbs/day	mg/l		lbs/day	mg/l	lbs/day	mg/l	lbs/day
	w							< 1													
	t																				
	f																				
	s																				
	s																				
	m																				
	t	< 2.40		16.97	0.80		5.66														
	w							< 1													
	t																				
	f																				
	s																				
	s																				
	m																				
	t	< 2.40	<	14.92	< 1.00	<	6.22			0.51	3.17	0.90	5.60	0.10		0.62	0.31	1.93	0.59	3.67	
	w																				
	t							2.0													
	f																				
	s																				
	s																				
	m																				
	t	< 2.40	<	10.78	< 0.50	<	2.24														
	w							< 1													
	t																				
	f																				
	s																				
	s																				
	m																				
	t	< 2.40	<	12.96	< 0.50	<	2.70														
	w							< 1													
	t																				
TOTAL																					
AVERAGE		< 2.40	<	13.91	< 0.70	<	4.21	< 1.2		0.51		0.90		0.10		0.62	0.31	1.93	0.59	3.67	
MAXIMUM		< 2.40	<	16.97	< 1.00	<	6.22	< 2.0		0.51	3.17	0.90	5.60	0.10		0.62	0.31	1.93	0.59	3.67	
MINIMUM		< 2.40	<	10.78	< 0.50	<	2.24	< 1.0		0.51	3.17	0.90	5.60	0.10		0.62	0.31	1.93	0.59	3.67	

MONTHLY OPERATIONS REPORT

Tidewater Utilities

SITE: LEWES WWTF **APRIL**

		INFLUENT							
DATE	DAY	INFLUENT	BOD5				TSS		
		MGD	mg/l		lbs/day		mg/l		lbs/day
	w	0.7307							
	t	0.5640							
	f	0.5483							
	s	0.6413							
	s	0.8193							
	m	0.8147							
	t	0.7975	<100		<665.1		40.00		266.05
	w	0.7997							
	t	0.7960							
	f	0.5093							
	s	0.7016							
	s	0.7493							
	m	0.7525							
	t	0.5459	113.00		514.50		140.00		637.39
	w	0.5509							
	t	0.5396							
	f	0.5196							
	s	0.4985							
	s	0.4931							
	m	0.4881							
	t	0.5884	46.20		226.72		28.00		137.40
	w	0.5806							
	t	0.5976							
	f	0.7257							
	s	0.6473							
	s	0.6689							
	m	0.6407							
	t	0.6434	101.00		541.96		80.00		429.28
	w	0.6692							
	t	0.6687							
TOTAL		**19.2904**							
AVERAGE			**86.73**		**427.73**		**72.00**		**367.53**
MAXIMUM			**113.00**		**541.96**		**140.00**		**637.39**
MINIMUM			**46.20**		**226.72**		**28.00**		**137.40**

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			0.00	0.00		-	3,171,966.70		0.00	0.00
June	30			0.00	0.00		-	3,171,966.70		0.00	0.00
July	31			0.00	0.00		-	3,171,966.70		0.00	0.00
August	31			0.00	0.00		-	3,171,966.70		0.00	0.00
September	30			0.00	0.00		-	3,171,966.70		0.00	0.00
October	31			0.00	0.00		-	3,171,966.70		0.00	0.00
November	30			0.00	0.00		-	3,171,966.70		0.00	0.00
December	31			0.00	0.00		-	3,171,966.70		0.00	0.00
Year Balance								3,171,966.70			

Comments:

Authorized Signatory

4/5/2020
DATE

MIDDLESEX WATER COMPANY
LEWES BPW, WWTP, LEWES, DE

LOSS CONTROL REPORT

To: Janine Bauer, Risk Services Manager

Date: March 5, 2020

Date of Survey: February 24, 2020

PURPOSE AND SCOPE

This report confirms the loss control survey conducted on February 24, 2020. On that day I visited the Lewes sewerage treatment plant in Lewes, DE. The purpose of the visit was to identify potential safety concerns at the plant. I was accompanied by Rich Thieling, Middlesex Water, who provided access to the site.

We were assisted by Paul Peris, Director of Production and Maintenance and Neil Girardi, Maintenance Supervisor.

All observations made were communicated with site employees at the time of the visit. A Recommendations Tracking page has been attached to this document which includes photos of the identified conditions which are referenced throughout this report.

The plant is owned by the City of Lewes and operated by White Marsh Environmental Systems. There are two employees assigned to work at this location but additional workers are brought in as needed. All structures on site were accessed during the visit and the observations are listed below.

Kenneth M. Bogdan, CSP
Vice President / Director
Risk Control Services
TRIAD 1828 Center
2 Cooper Street
Camden NJ 08102
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Telephone: 732.660.5040
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OBSERVATIONS

Laboratory/Office

The Laboratory is located in a small building that also houses several offices, restrooms and an employee locker room (Photo MWC-022420-01).

Several binders containing Safety Data Sheets (SDS) are maintained in the laboratory. We did not review these to determine the full contents, however we recommend an annual review to ensure that all chemicals used on site are included.

A single eyewash bottle is supplied in the lab (Rec MWC-022420-02). We recommend the installation of a permanent eye wash station that meets ANSI requirements. A unit can be attached to the faucet to accomplish this. A web link has been included in the recommendations page that shows an example of this.

A Halon portable fire extinguisher has been provided in the lab (Rec MWC-022420-03). The use of portable halon fire extinguishers is rare. Check with your supplier to determine if this unit is appropriate for this environment.

Garage

The Garage building is used primarily for storage.

There is a breaker panel on the wall with tape covering one of the closed breakers (Rec MWC-022420-04). The reason for this should be determined and the tape should be removed. If necessary, appropriate lockout/tagout procedures will need to be implemented. In addition, there were no arc flash warnings on the cover of the pane which is a requirement of NFPA 70E. This was the case with other electrical equipment located in the plant. Consult with a licensed electrician or electrical engineer to determine the specific signage needs.

There is gasoline can with the word “diesel” written on it (Rec MWC-022420-05). All flammable/combustible fuels must be stored in the specific containers. This container must be removed from service.

There is a clothes dryer in the Garage with the vent laying on the floor and not vented outdoors (Rec MWC-022420-06). It was stated that this dryer is not used. If so, it should be removed from the Garage.

There are many buckets and containers containing oil and other substances stored in the Garage (Rec MWC-022420-07). These chemicals need to be stored in a more orderly fashion.

Head Works Building

The Head Works Building is an industrial structure that houses equipment and processes (Photo MWC-022420-08).

A pit outside the entrance was open an unattended (Rec MWC-022420-09). Ensure that A guard rail system or other means of fall protection are provided around open pits with fall potential of 4 feet or greater. In addition, this and all other permit required confined spaces need to be labeled in accordance with OSHA requirements (Reference 29 CFR 1910.146(c)(2)).

On the second floor, we observed a confined space retrieval device that has been installed for work performed in this area (Rec MWC-022420-10). Again, ensure that all confined spaces are properly labeled. We recommend an evaluation of all confined space entry procedures for this plant.

It was noted a throw ring was missing on the walkways over oxidation tanks (Rec MWC-022420-11). Otherwise, the grating and rails over the walkways throughout the site are in good condition.

Process Building

It was stated that a contractor has been hired to work in this building to continue work with the screens inside the pits. At the time of our visit, this contractor was not on site.

Fasteners have been installed on the grates here to prevent movement (Photo MWC-022420-13).

A horizontal lifeline system has been installed by contractor who is performing work over the grates (Rec MWC-022420-13 & 14). We recommend that you request engineering documents from the contractor that include details about this system and ensure that it is installed properly.

Housekeeping in this building is very poor and trip hazards are abundant due to poor material storage practices (Rec MWC-022420-15). It was stated that most of the equipment we observed belonged to the contractor that has been hired.

We observed on extension cord that been repaired in house (Rec MWC-022420-16). This practice is not advised because the cord will not meet the manufacturers specifications. Defective cords need to be removed from service and replaced.

Access to a fire extinguisher was obstructed by a power washer (Rec MWC-022420-17). Access to fire extinguishers must remain unobstructed. This power washer had a full gasoline tank and needs to be stored outside the building. Perhaps in the garage or equipment storage building.

A dirty pair of goggles was hanging on a piece of equipment (Rec MWC-022420-18). PPE needs to be stored properly and maintained in good condition. Signage is posted in several areas of the plant requiring PPE use (Rec MWC-022420-19). However, it is not clear if these procedures are enforced. We recommend an evaluation of PPE use for all task needs to be evaluated.

On the Mezzanine it was noted that toe boards are missing (Rec MWC-022420-20). Install toe boards to prevent objects from falling to a lower level.

Chemical Room

The lights in this room are not working and need to be repaired. Also, the sign outside the building states that goggles are required but it is not clear how/if this is enforced (Rec MWC-022420-21).

Skid Steer & Forklifts

There is a skid steer on site that is used by company employees (Rec MWC-022420-22). Ensure that employees have been trained to operate this equipment and repair the backup alarm.

There are two forklifts on site: An articulating lift that has been rented (Rec MWC-022420-23) and a smaller unit that is owned (Rec MWC-022420-24). Ensure that workers are properly trained to operate forklifts and are performing the required daily inspections (Reference 29 CRR 1910.178(l)(3) and (q)(7)). It was also noted that the propane tank on the smaller unit is rusty. We recommend replacing it.

Equipment Storage Building

Wood products haphazardly stored in this building (Rec MWC-022420-25). Housekeeping and material storage methods in this area need improvement.

Various types of chemicals are stored haphazardly here (Rec MWC-022420-26). Oxidizers and gasoline were observed to be by stored side by side. Some, but not all, drums are stored on secondary containment (spill decks). This is an OSHA requirement and considered best practice. All flammable liquids need to be stored in flammable liquid storage bins. Consider replacing all gasoline cans with metal, self-closing units.

Digester Building

Some type of testing equipment was set up in front of an open breaker panel (Rec MWC-022420-27). 36” of clearance must be maintained around electrical equipment at all times. It is unclear what this equipment is being used for but it should be evaluated.

A drum labeled “P847E” is stored here with the bung hole open (Rec MWC-022420-28). It is believed to be a chemical used to treat sewerage. None of the drums in this room are

stored on secondary containment (spill decks). Chemical use and storage in this facility needs to be evaluated.

The tread depth on the stairs leading to the lower level of this building is less than 8 inches (MWC-022420-29). OSHA requires tread depth to be not less than 9.5 inches (Reference 1910.25(c)(3)). There are exceptions where the depth may be as little as 8" (but not less), depending on the angle of the stairs (Reference 29 CFR 1910.25(c)(5)). Additional research into this is warranted at this time. In the interim, care should be taken when ascending these stairs.

The labels on a step ladder that is stored here are worn and unreadable (MWC-022420-30). As such, it should be considered defective. Also, it seems that the ladder has been modified by red bracing (see the arrow in the photo). Field modifications to a ladder are not permitted.

The grating on the stair landing was not secured with fasteners (MWC-022420-31). These need to be installed.

Storage Building

This building is used for storage of old files and other materials/equipment. We also noted several 5 gallon cans are stored here (Rec MWC-022420-32). It should be determined if these chemicals are needed and are being stored properly.

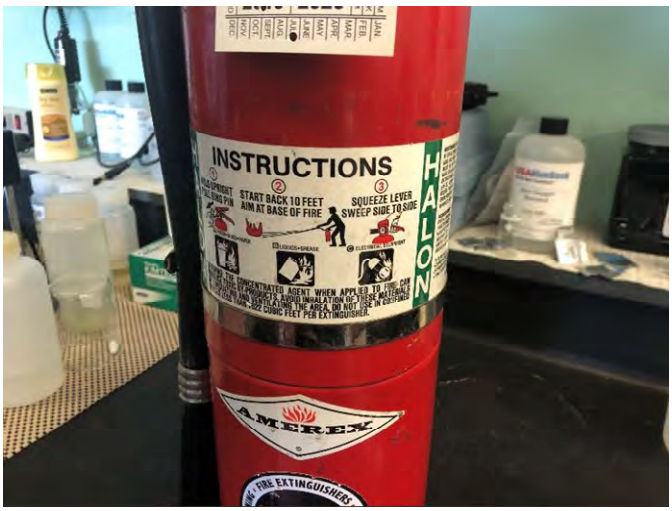
Thank you for the opportunity to provide you service. Please do not hesitate to contact me if you have any questions regarding this report.

REPORT SUBMITTED BY:

Kenneth Bogdan, CSP
Vice President/Director
Risk Control Services

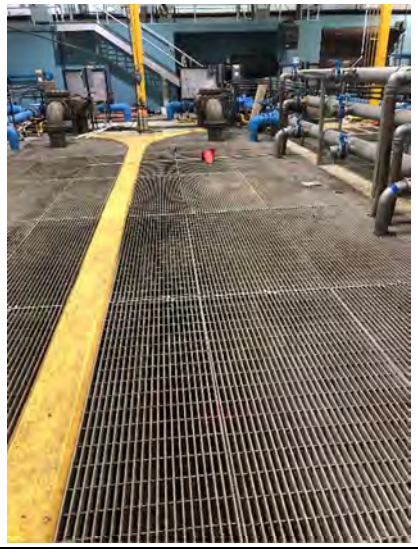
cc: Kathy Wyatt, Conner Strong & Buckelew
Fawna Shultie, Conner Strong & Buckelew
Chris Stone, Conner Strong & Buckelew
Travis Shaffer, Conner Strong & Buckelew

RECOMMENDATIONS TRACKING – MIDDLESEX WATER

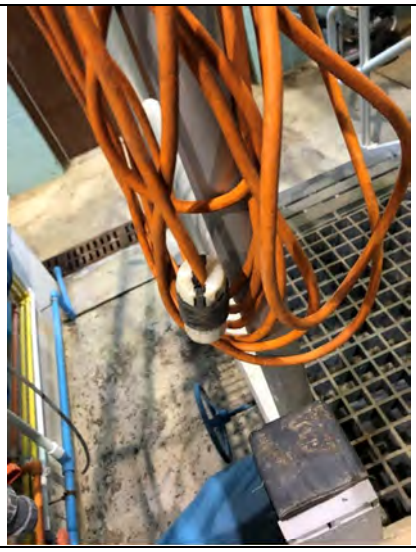
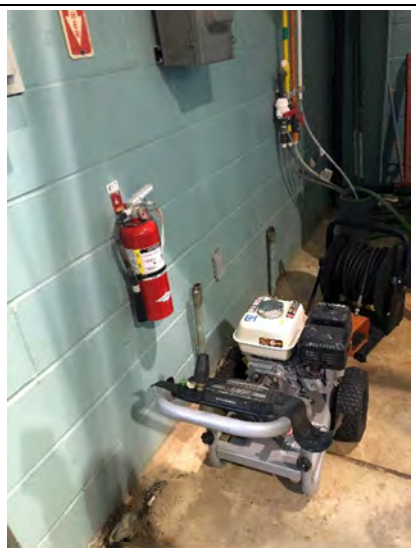
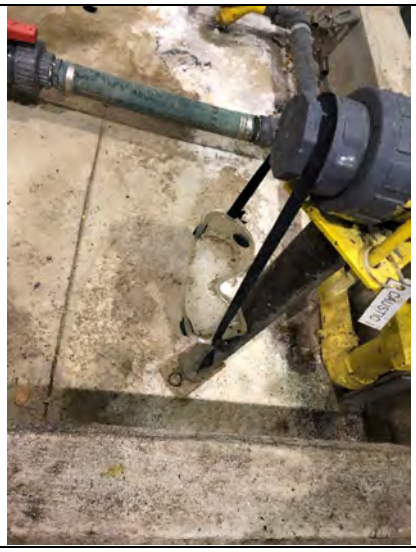
Rec. #		
MWC-022420-01	Laboratory Information only – No recommendation	
Notes:		
STATUS: Corrected [ ]	Estimated Completion Date [ ]	
MWC-022420-02	Laboratory – A single eyewash bottle is supplied here. We recommend the installation of a permanent eye wash station that meets ANSI requirements. A unit can be attached to the faucet to accomplish this. See the link below for an example:	
Notes: New eyewash is ordered.		
STATUS: Corrected [ ]	Estimated Completion Date [5/31/20]	
MWC-022420-03	Laboratory – A Halon portable fire extinguisher has been provided in the lab. Check with your supplier to determine if this unit is appropriate for this environment.	
Notes: Fire extinguisher has been verified by Delaware Fire Safety		
STATUS: Corrected [4/30/20]	Estimated Completion Date [ ]	

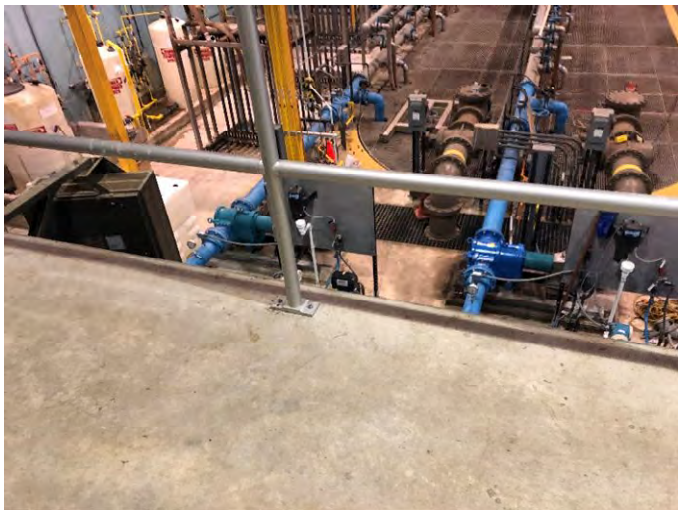
Rec. #		
MWC-022420-04	Garage – There is a breaker panel with tape cover one of the closed breaker. The reason for this should be determined. There were not arc flash warnings on the cover of the pane which is a requirement of NFPA 70E.	
Notes: Issue has been corrected.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		
MWC-022420-05	Garage – There is gasoline can with the word “diesel” written on it. This needs to be removed.	
Notes: Can has been removed and discarded.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		
MWC-022420-06	Garage – There is a clothes dryer here with the vent laying on the floor. It was stated that this dryer is not used. If so, it should be removed from the Garage.	
Notes: Dryer belongs to BPW. Request for permission to remove is included in the April 2020 monthly report.		
STATUS: **Corrected** **Estimated Completion Date** 5/31/20		

Rec. #		
MWC-022420-07	Garage – There are many buckets and containers containing oil and other substances. These chemicals need to be stored in a more orderly fashion.	
Notes: Buckets and containers removed and contents properly disposed.		
STATUS: Corrected 4/30/20 Estimated Completion Date		
MWC-022420-08	Head Works Building Information purposes only – no recommendation.	
Notes:		
STATUS: Corrected Estimated Completion Date		
MWC-022420-09	Head Works Building – Pit outside the entrance was open an unattended. Ensure that means of fall protection are provided around open pits with fall potential of 4 feet or greater. All confined spaces need to be labeled.	
Notes: 29 CFR 1910.146(c)(2) If the workplace contains permit spaces, the employer shall inform exposed employees, by posting danger signs or by any other equally effective means, of the existence and location of and the danger posed by the permit spaces.		
STATUS: Corrected 4/31/20 Estimated Completion Date		

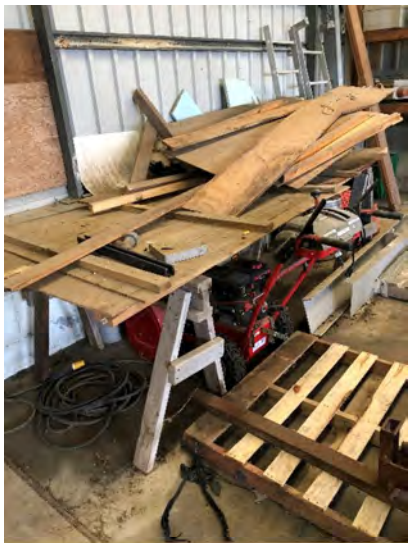
Rec. #		
MWC-022420-10	Head Works Building – 2nd floor – A confined space retrieval device has been installed for work performed in this area. Again, ensure that all confined spaces are properly labeled. We recommend an evaluation of all confined space entry procedures for this plant.	
Notes: Retrieval device removed and stored.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		
MWC-022420-11	Walkway over oxidation tanks – Grating and rails are in good condition but there was no throw ring.	
Notes: New rings were purchased and installed		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		
MWC-022420-12	Process Building – Fasteners have been installed on the grates here to prevent movement.	
Notes: Grates were fastened in January of 2020		
STATUS: **Corrected** 1/2020 **Estimated Completion Date**		

Rec. #		
MWC-022420-13	Process Building – A horizontal lifeline system has been installed by contractor who is performing work over the grates. Request engineering documents from the contractor that include details about this system and ensure that it is installed properly.	
Notes: Permanent lifeline was purchased. Will be installed following completion of membrane upgrades.		
STATUS: Corrected [ ] Estimated Completion Date [5/31/20]		
MWC-022420-14	Process Building - A horizontal lifeline system has been installed by contractor who is performing work over the grates. Request engineering documents from the contractor that include details about this system and ensure that it is installed properly.	
Notes: See Above		
STATUS: Corrected [ ] Estimated Completion Date [5/31/20]		
MWC-022420-15	Process Building – Housekeeping in this building is very poor. Trip hazards are abundant due to poor material storage practices.	
Notes: Hazards were removed.		
STATUS: Corrected [4/30/20] Estimated Completion Date [ ]		

Rec. #		
MWC-022420-16	Process Building – This extension cord has been repaired in house. This practice is not advised because the cord will not meet the manufacturers specifications. Defective cords need to be removed from service and replaced.	
Notes: Cord was removed and replaced.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		
MWC-022420-17	Process Building – Access to a fire extinguisher was obstructed by a power washer. Access to fire extinguishers must remain unobstructed. This power washer had a full gasoline tank and needs to be stored outside the building. Perhaps in the garage or equipment storage building.	
Notes: Obstruction removed.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		
MWC-022420-18	Process Building – A dirty pair of goggles was hanging on a piece of equipment. PPE needs to be stored properly and maintained in good condition. PPE use for all task needs to be evaluated.	
Notes: Goggles removed. PPE properly stored in maintenance building. Subpart I and Z were reviewed for proper PPE usage. Staff received Subpart I training in April 2020.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		

Rec. #		
MWC-022420-19	Process Building – Signage is posted in several areas of the plant requiring PPE use. However it is not clear if these procedures are enforced.	
Notes: See above.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		
MWC-022420-20	Process Building – Mezzanine – Install toe boards to prevent objects from falling to a lower level.	
Notes: Toe boards have been ordered according to OSHA standards.		
STATUS: **Corrected** **Estimated Completion Date** 5/31/20		
MWC-022420-21	Chemical Room – The lights in this room are not working and need to be repaired. Also, the sign outside the building states that goggles are required but it is not clear how/if this is enforced.	
Notes: Lights have been replaced. Staff received Subpart I training in April on PPE.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		

Rec. #		
MWC-022420-22	Skid Steer – Ensure that employees have been trained to operate this equipment. It was noted that the backup alarm on this unit was not functioning.	
Notes: Employees have received training on operation of the skid steer. Back up alarm was replaced and unit serviced.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		
MWC-022420-23	Forklifts – This articulating forklift has been rented and is used by site workers. There is also a smaller forklift on site. Ensure that workers are properly trained to operate forklifts and are performing the required daily inspections.	
Notes: 29 CRR 1910.178(l)(3) and (q)(7) Employees have received fork lift training and unit was serviced by Eastern Lift.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		
MWC-022420-24	Forklifts – The propane tank on this forklift is showing severe signs of aging/rust. We recommend replacing it.	
Notes: Tank was not needed. It was removed and properly disposed.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		

Rec. #		
MWC-022420-25	Equipment Storage Building – Wood products haphazardly stored. Housekeeping and material storage methods in this area need improvement.	
Notes: Material was organized and old materials were disposed.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		
MWC-022420-26	Equipment Storage Building – Various types of chemicals are stored haphazardly here. Oxidizers and gasoline were observed by stored side by side. Some, but not all, drums are stored on secondary containment (spill decks). This is an OSHA requirement and considered best practice.	
Notes: All flammable liquids need to be stored in flammable liquid storage bins. Consider replacing all gasoline cans with metal, self-closing units. Materials are separated as required. Disposal of old liquids is proceeding.		
STATUS: **Corrected** **Estimated Completion Date** 5/31/20		
MWC-022420-27	Digester Building – This equipment was set up in front of an open breaker panel. 36” of clearance must be maintained around electrical equipment. It is unclear what this mechanism is se being used for but it should be evaluated.	
Notes: Equipment was removed to allow for the 36" clearance.		
STATUS: **Corrected** 4/30/20 **Estimated Completion Date**		

Rec. #		
MWC-022420-28	Digester Building – A drum labeled "P847E" is stored here with the bung hole open. None of the drums in this room are stored on secondary containment (spill decks). Chemical use and storage in this facility needs to be evaluated.	
Notes: Drum was removed and disposed. Additional containment has been ordered.		
STATUS: Corrected [ ] Estimated Completion Date [5/31/20]		
MWC-022420-29	Digester Building – The tread depth on the stairs leading to the lower level of this building is less than 8 inches. OSAH requires tread depth to be not less than 9.5 inches (1910.25(c)(3). There are exceptions where the depth may be 8", depending on the angle. Reference 29 CFR 1910.25(c)(5).	
Notes: Additional research into this condition is warranted. Stairs require engineer to validate need for replacement. Request included in BPW April monthly report. This is not an immediate safety issue.		
STATUS: Corrected [ ] Estimated Completion Date [5/31/20]		
MWC-022420-30	Digester Building – The labels on the step ladder are worn and unreadable. As such, it should be considered defective. Also, it seems that the ladder has been modified by red bracing (see arrow). Field modifications to a ladder are not permitted.	
Notes: Ladder has been removed and disposed.		
STATUS: Corrected [4/30/20] Estimated Completion Date [ ]		

Rec. #		
MWC-022420-31	Digester Building – The grating on the stair landing was not secured with fasteners. These need to be installed.	
Notes: Work order for fasteners is in process.		
STATUS: **Corrected** [ ] **Estimated Completion Date** 5/31/20		
MWC-022420-32	Storage Building – Several 5 gallon drums of chemicals are stored here. It should be determined if these chemicals are needed and are being stored properly.	
Notes: Evaluation of storage is ongoing.		
STATUS: **Corrected** [ ] **Estimated Completion Date** 5/31/20		

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

Action Item	Due Date	Action Owner	Status Open/ Complete/ Ongoing	Comments/Notes
1. Replace all four trains of filter membranes	May 2020	BPW	Open	Two trains installed and the remaining two are in process of installation. Retrofit to LEAP and additional membranes for the other 2 trains started on 4/28/20. Parts were partially shipped and have delayed the project by 4 days. Expected completion is 5/15/20.
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 waktrough 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. The next walkthrough has not been scheduled by BPW/GMB with WMES.
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 maintaing the electrnoic verison and a hard copy desk verison 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 accessto 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	5/1/2020	BPW	Open	received by the BPW, it will be installed by the BPW's consultant (Keystone) in consultation with Suez.
7. Perform an engineering analysis of the entire plant to identify ways to improve redundancy andreliability 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.
9. Improve reporting requirements from WMES to BPW for:	5/16/2020	WMES	Complete/Ongoing	Included in April Monthly Report to BPW.
a. Off-normal conditions at the plant	5/16/2020	WMES	Complete/Ongoing	Included in April Monthly Report to BPW.
b. Discharges outside of Permit limits	5/16/2020	WMES	Complete/Ongoing	Included in April Monthly Report to BPW.
c. OHSA accidents	5/16/2020	WMES	Complete/Ongoing	Included in April Monthly Report to BPW.
d. Details included in monthly reports (to include trending of performance data, trendingof equipment failures, preventative maintenance required, suggested capital improvements and other concerns)	5/16/2020	WMES	Complete/Ongoing	Included in April Monthly Report to BPW.
e. WMES to present their report at the monthly BPW meeting	5/16/2020	WMES	Complete/Ongoing	Included 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	Open	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	Open	BPW indicates that its staff will commence this as part of the April monthly report process.

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

Action Item	Due Date	Action Owner	Status Open/ Complete/ Ongoing	Comments/Notes
c. Annual review of WMES Policies and Procedures	5/16/2020	BPW	Open	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	Open	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	Open	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 b. Perform audit by a sub-group of the Board of the BPW operation and management 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.
12. WMES to develop plans for operating plant in off-normal conditions. BPW provided WMES witha 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.
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	5/16/2020	WMES	Open	Information included in April Monthly Report to BPW.
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 berequired. 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	April 2020	BPW	Unlnown	To be completed prior to work starting in April 2020 when new filters are installed.

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

Action Item	Due Date	Action Owner	Status Open/ Complete/ Ongoing	Comments/Notes
b. Confined entry permit	April 2020	BPW	Unlnown	To be completed prior to work starting in April 2020 when new filters are installed.
c. Personal Protective Equipment	April 2020	BPW	Unlnown	To be completed prior to work starting in April 2020 when new filters are installed.
d. General Housekeeping	April 2020	BPW	Unlnown	To be completed prior to work starting in April 2020 when new filters are installed.
e. Chemical control and handling	April 2020	BPW	Unlnown	To be completed prior to work starting in April 2020 when new filters are installed.
18. WMES to provide a monthly update on its Corrective Actions to BPW	4/16/2020	WMES	Ongoing	Initially due 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.

White Marsh Environmental Systems, Inc.
Lewes Board of Public Works – Root Cause Report
Corrective Action Responses – April 2020

Set forth below are Corrective Action items #8, #9 and #14 contained in the Lewes Board of Public Works' (BPW) Root Cause Report followed by White Marsh Environmental Systems, Inc.'s (WMES's) response to each Corrective Action item.

Corrective Action #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

Status: WMES to provide a schedule in their April 2020 report

WMES Response – WMES proposes to implement an improvement program concentrating on the following 5 areas.

- Enhanced WMES Oversight
    - The WMES Direct Responsible Charge (DRC) operator will prepare and submit weekly status reports on plant operations, maintenance and lab testing results for review by the WMES District Manager and the WMES Director of Production and Maintenance.
    - All off-normal conditions are immediately reported to the WMES District Manager and the WMES Director. The WMES Director or his designee is responsible for immediately contacting the BPW General Manager.
- Enhanced communication to BPW
    - The WMES Director or his designee will maintain weekly communication with the BPW General Manager providing updates for operations and ongoing improvement projects. Communication may be done onsite, phone or email weekly as requested by BPW.
    - All off-normal conditions are immediately reported to the BPW General Manager by the WMES Director or his designee.
- Enhanced Monthly Reports from WMES
    - Monthly Reports will include trending graphs on membrane performance, preventative maintenance, equipment issues, safety concerns, off normal conditions at the plant, discharges outside of permit limits, OSHA accidents, capital improvements open items to/from WMES/BPW and status updates on Corrective Actions.
- Operations and Maintenance
    - WMES operations staff has increased oversight of daily plant operations. A Plant operators walks through the plant five times per day to perform operations checks, lab tests and update the Zenon spreadsheet daily. WMES maintenance staff performs bi-weekly onsite lift station inspections and operational staff performs daily lift station checks using the Point Watch Monitoring System.
    - WMES uses the Oracle Work and Asset Management system (WAM) to create and track

all scheduled and unscheduled work on the BPW plant and lift station assets. These assets were identified and loaded into the WAM system in April 2017. During the identification process, manufacturer recommended service intervals were identified and a preventative maintenance schedule was created. The WAM system creates preventative maintenance work orders at the recommended manufacturer intervals and resets the periodic maintenance (PM) calendar to the next interval when the work order is finished. During the work order finishing process, the WMES reviews the work history of the asset and identify any corrective or preventative action needed to prolong equipment life or prepare documentation for replacement in the BPW capital program.

- WMES maintenance staff has five Delaware licensed electricians; five qualified and trained maintenance technicians, and three maintenance supervisors. The maintenance supervisors combined have over 50 years of project management experience. All preventative, repair and electrical work will be completed by the maintenance staff and managed by a maintenance supervisor under the oversight of the WMES District Manager and WMES Director.

- Safety
  - WMES has an enterprise-wide safety program and has a written program for each relevant subpart, a PowerPoint training module and skills test. Each month all staff members receive training in an OSHA subpart or relevant safety subject. Subpart training documents are maintained electronically and are reviewed annually by the enterprise safety committee. The 2020 training schedule was provided to BPW in the amended March 2020 Monthly Report.

Corrective Action #9 - Improve reporting requirements from WMES to BPW for:

a) Off-normal conditions at the plant

b) Discharges outside of Permit limits

c) OHSA accidents

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)

e) WMES to present their report at the monthly BPW meeting

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. above

Status: To start with April 2020 report

WMES Response – The BPW General Manager Darrin Gordon is notified of any off-normal conditions at the plant, lift stations, any discharge outside of permit limits or an OSHA reportable incident. Those communications are performed by Paul Peris, WMES Director of Production and Maintenance. In the event Mr. Peris is unavailable, then WMES General Manager, Bruce Patrick, will maintain communications with Mr. Gordon or his designee. WMES will attend BPW board meetings as requested and will be prepared to present the current monthly report. The April 2020 monthly report includes the items listed in Corrective Action #9 items a-d above. The Suez Insight system has not been installed so

trending information is limited to single points in time, but is provided with the monthly report. WMES is submitting available trending graphs using the data from the Suez Zenon spreadsheet. The 2020 Annual Report will reflect Corrective Action #9 item f. If the BPW has a question about a previous monthly report or requires additional information, please contact WMES as soon as possible.

Corrective Action #14 - Require all WMES operational staff to have appropriate training by Suez on the proper operation and maintenance of the filters and plant

Status: WMES to provide schedule in their April 2020 report

WMES Response – WMES was scheduled to attend a 2 day training seminar hosted by Suez in Baltimore in April 2020 which was cancelled by Suez due to the Covid 19 pandemic. The seminar is currently rescheduled for October 2020 and WMES intends to participate. The attendees would be the DRC operator, WMES District Manager with select operators, and the WMES Director of Production and Maintenance. WMES operational staff is participating in the retrofit of the Zeeweed membranes to the LEAP system with the Suez factory support team providing on-site guidance and training to WMES personnel. WMES will also investigate additional training opportunities provided by Suez when the Delaware State of Emergency quarantine guidelines permit.