PUMP STATION 196

Dec-21		PS 196		
		METER READING	24 HOUR FLOW	Wolfe Neck in yellow
WED	1	86814940	0.165292	W
THU	2	86980232	0.149388	turned flow back
FRI	3	87129620	0.265340	to Lewes
SAT	4	87394960	0.266940	
SUN	5	87661900	0.272740	
MON	6	87934640	0.269950	
TUE	7	88204590	0.253380	
WED	8	88457970	0.251340	
THU	9	88709310	0.252520	
FRI	10	88961830	0.258870	
SAT	11	89220700	0.266220	
SUN	12	89486920	0.258810	
MON	13	89745730	0.253930	
TUE	14	89999660	0.261180	
WED	15	90260840	0.283770	
THU	16	90544610	0.217590	
FRI	17	90762200	0.254560	
SAT	18	91016760	0.266930	
SUN	19	91283690	0.264780	
MON	20	91548470	0.262750	
TUE	21	91811220	0.265070	
WED	22	92076290	0.281910	
THU	23	92358200	0.284330	
FRI	24	92642530	0.301890	
SAT	25	92944420	0.275010	
SUN	26	93219430	0.298690	
MON	27	93518120	0.295530	
TUE	28	93813650	0.290960	
WED	29	94104610	0.292970	
THU	30	94397580	0.297480	
FRI	31	94695060	0.305990	
		95001050		total flow t Wolfeneck
	TOTAL		8.186110	165,292 gallons
	COUNT		31	total flow to Lewes
	AVERAGE		0.264068	8,020,818 gallons
	MINIMUM		0.149388	
	MAXIMUM		0.305990	

LEWES BPW WWTP Biweekly InSight Report

Date: 1/12/2022

From: Erin Horocholyn - Suez Water Technologies & Solutions
To: Austin Calaman BPW, Inframark
cc: Matt Stapleford - Suez Water Technologies & Solutions

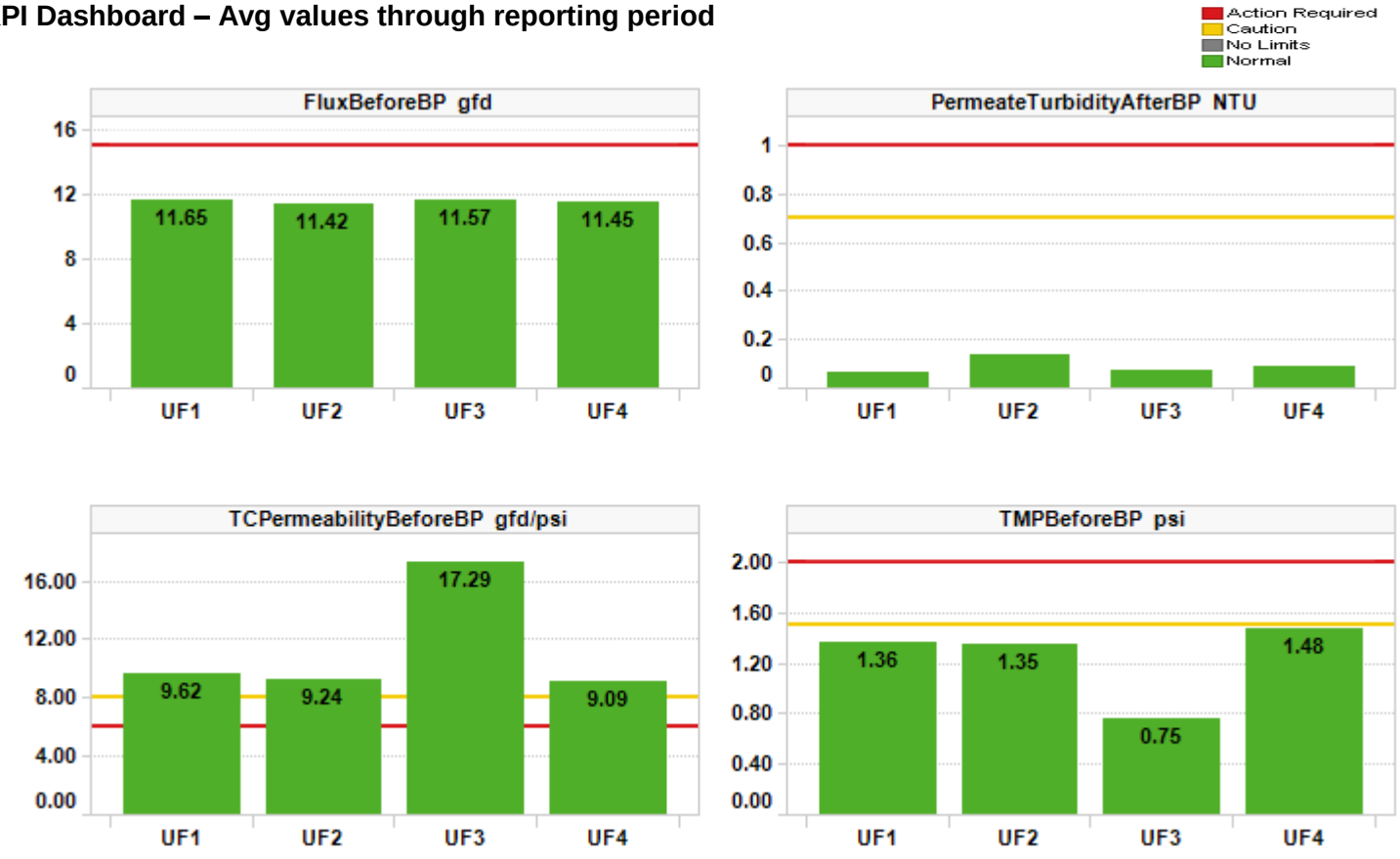
System Equipment

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 trains UF3 and UF4

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

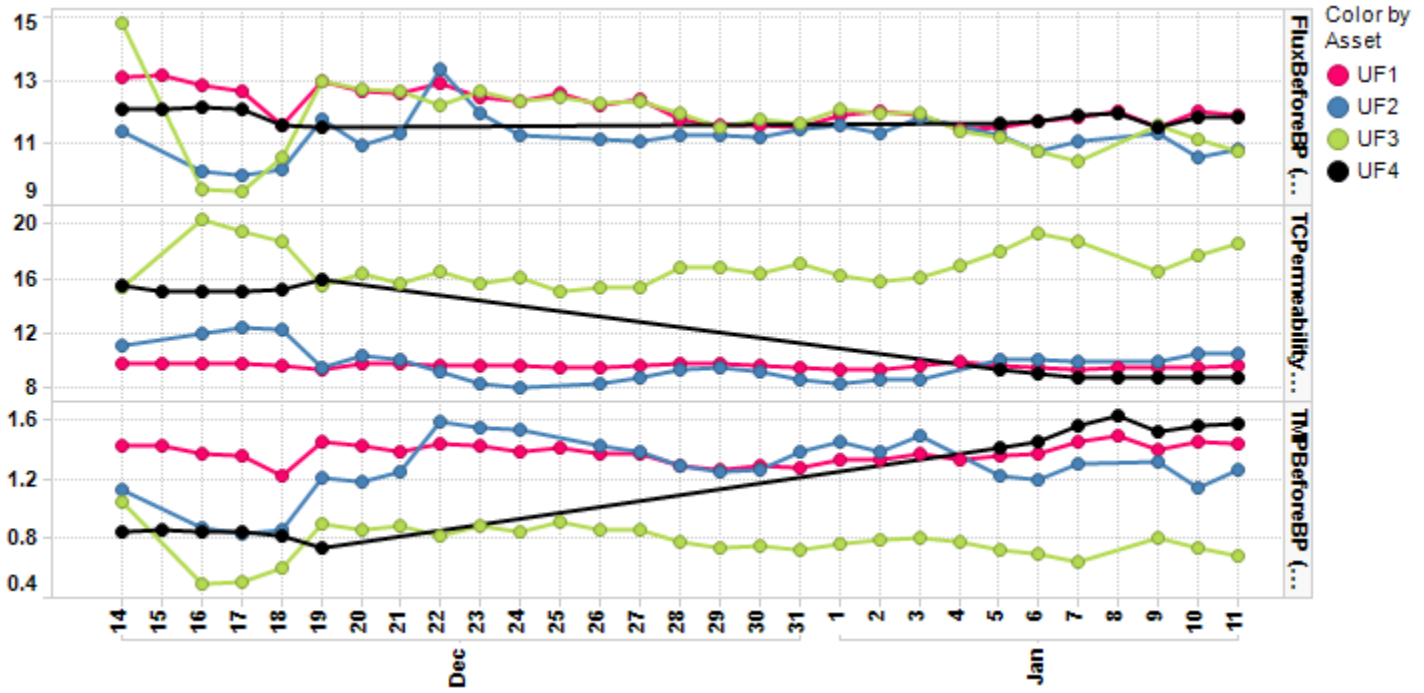
KPI Dashboard – Avg values through reporting period



Plant Summary

Trains UF1,2,3 are operating well overall while UF4 saw a decrease in performance compared to the last report (+0.7 psi to TMP and -7 gfd/psi permeability loss). Permeability was >8.0 gfd/psi on all trains which is good. TMPs were <1 psi on UF3 and 1.4 – 1.5 psi on the other trains.

- Daily permeate production averaged 0.85 MGD with particularly high flow on Jan 1. UF1 and UF3 produced the majority of permeate from Dec 29 – Jan 5, while UF1 and UF4 produced the majority of the permeate from Jan 6 – 11. UF2 produced <15% of daily permeate except on Jan 1. Permeate temperature averaged 59°F (-4°F). All online trains are in Backpulse with constant LEAP Hi aeration
- TMP BBP was good, averaging <1.0 psi on UF3. UF1, UF2, and UF4's TMP averaged 1.4, 1.4, and 1.5 psi respectively. UF4's TMP increased from 0.76 psi last report to the current average of 1.5 psi
- TC permeability BBP averages were excellent and >8 gfd/psi. UF1, UF2, and UF3 averaged 10, 9, and 17 gfd/psi respectively. UF4 averaged 9 gfd/psi (down from 16 gfd/psi last report)
- The change in UF4's performance happened after an offline period from Dec 19 – Jan 5. Flux has not changed and therefore the higher TMPs are not due to high flow rates. UF4 only had 1 hypo and 1 acid MC in 2 weeks and may benefit from 2 hypo MCs/2 weeks while TMPs are higher to try and restore some performance. The plots below display daily median averages. Note the black line for UF4 increasing for TMP and decreasing for permeability while flux remains the same.



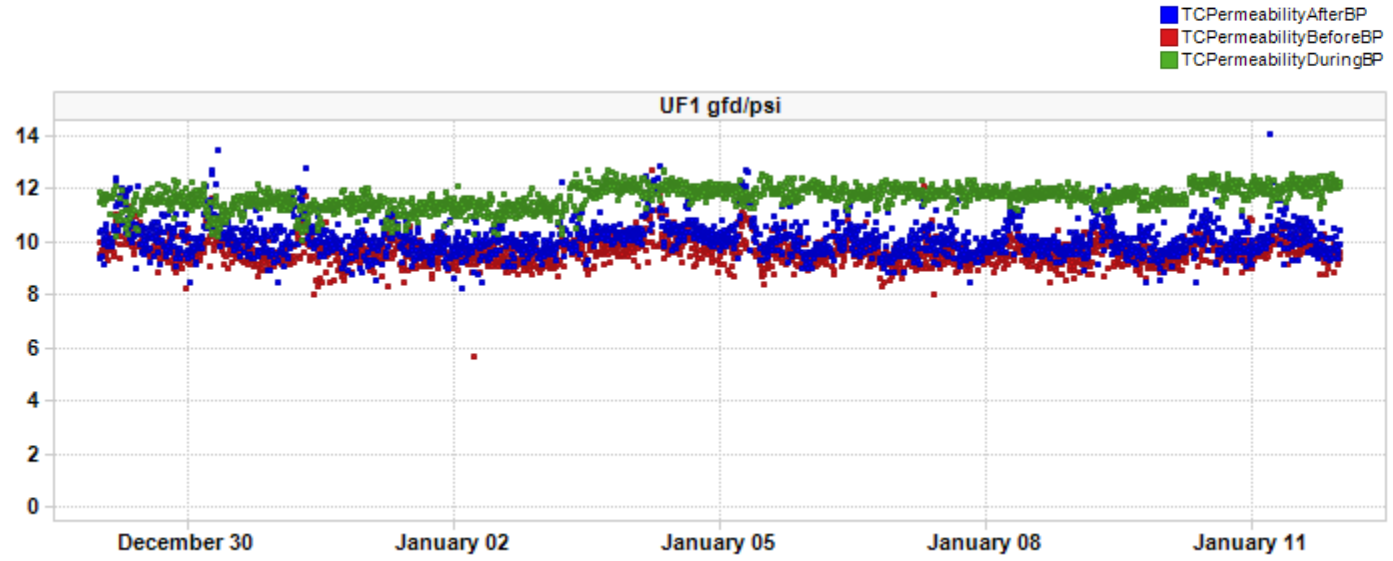
- Permeate turbidity ABP averages ranged from 0.06 – 0.14 NTU with a few spikes peaking at 0.5 NTU

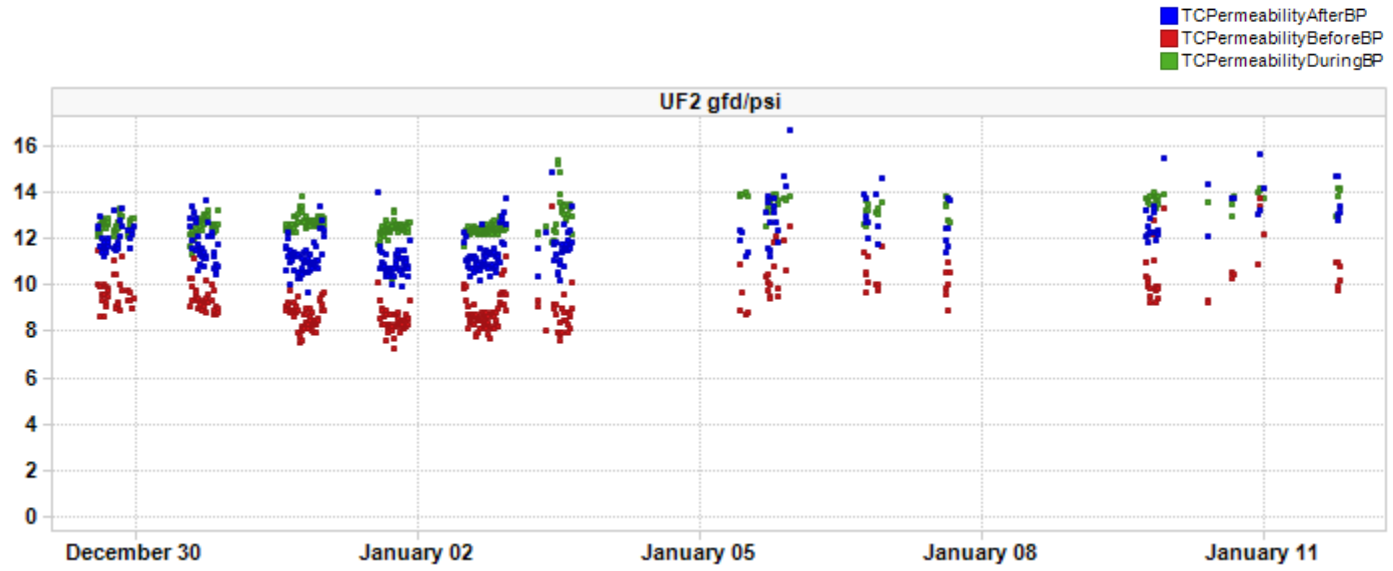
Table 1. Record of maintenance cleans (MCs) run.

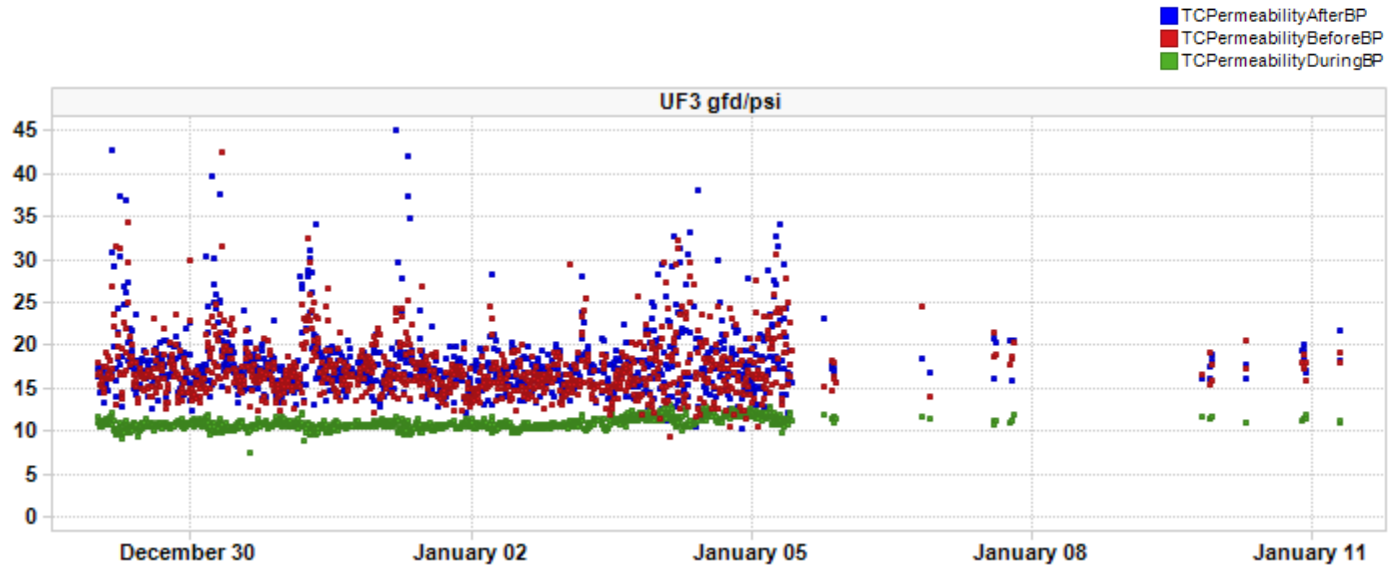
Train	UF1	UF2	UF3	UF4
# of Hypochlorite MCs	2	1	2	1
# of Citric Acid MCs	2	2	2	1

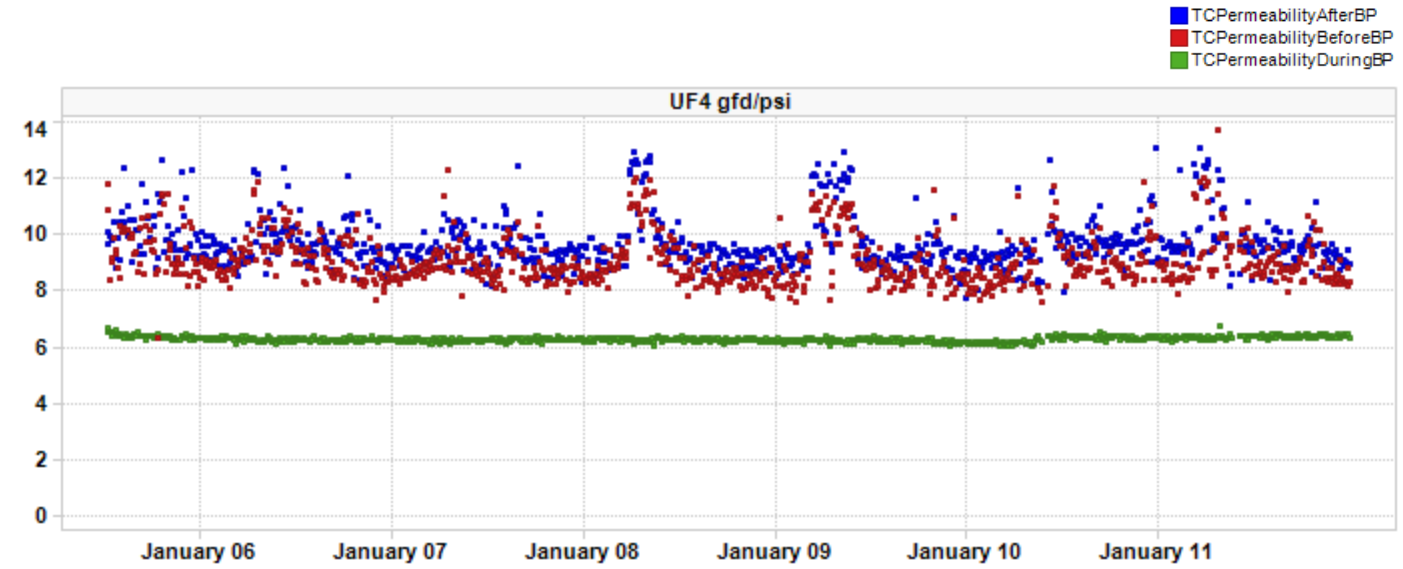
- Aerobic tank 1 dissolved oxygen averaged 0.98 ppm (+0.3 ppm). Tank 2 averaged 1.99 ppm which is a good and economical level. The pre-anoxic zone's DO averages were 0.81 ppm in tank 1, and 1.45 ppm in tank 2 which may be high for nitrification

TC Permeability Trends By Train

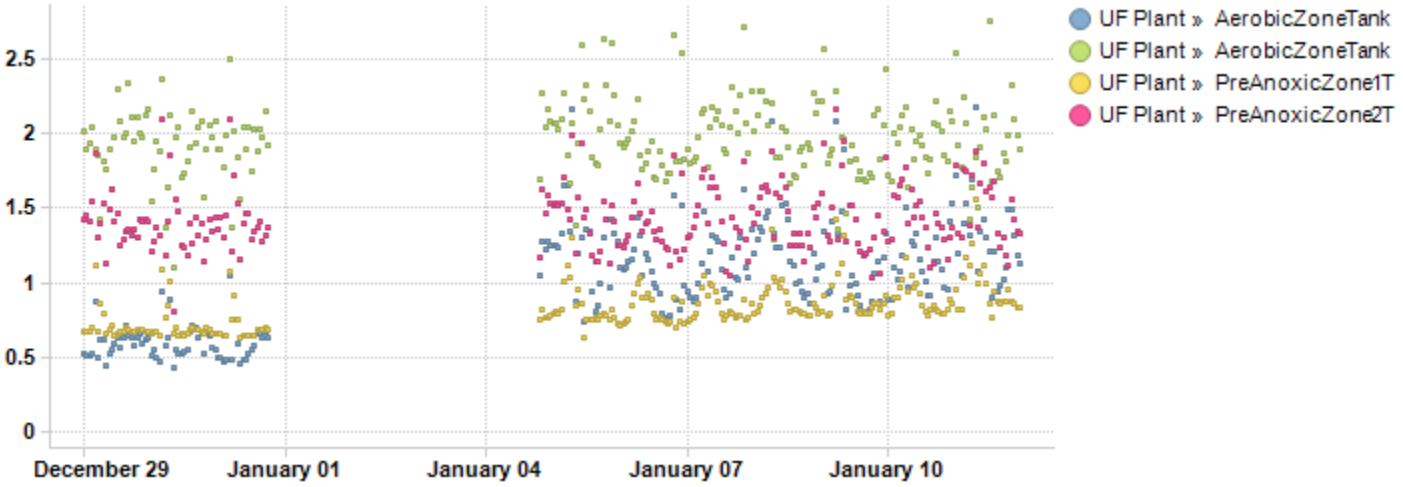




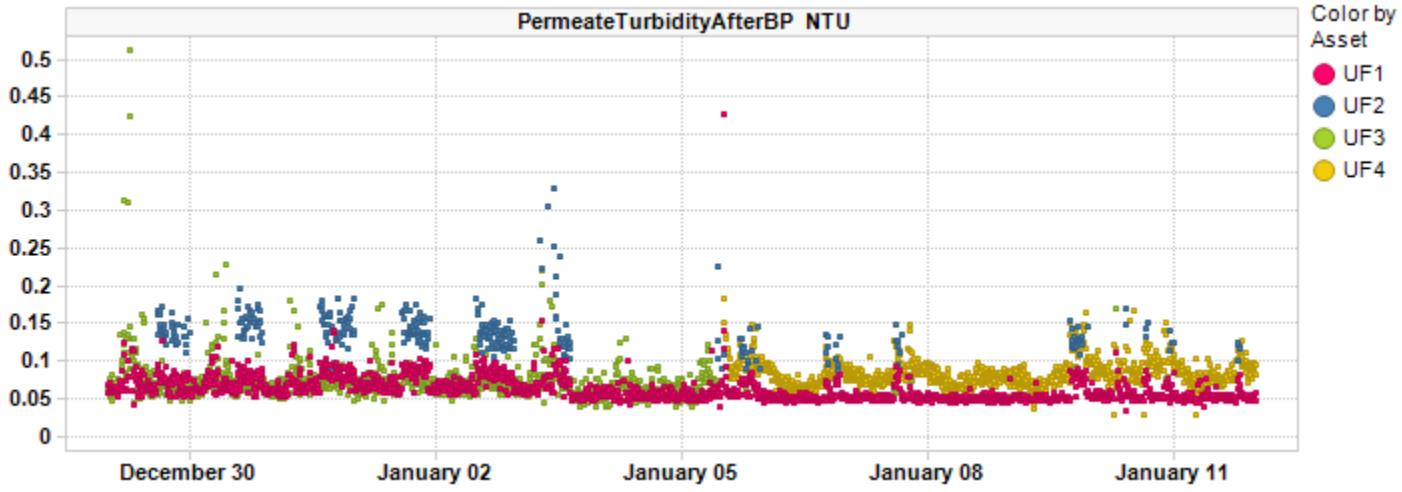




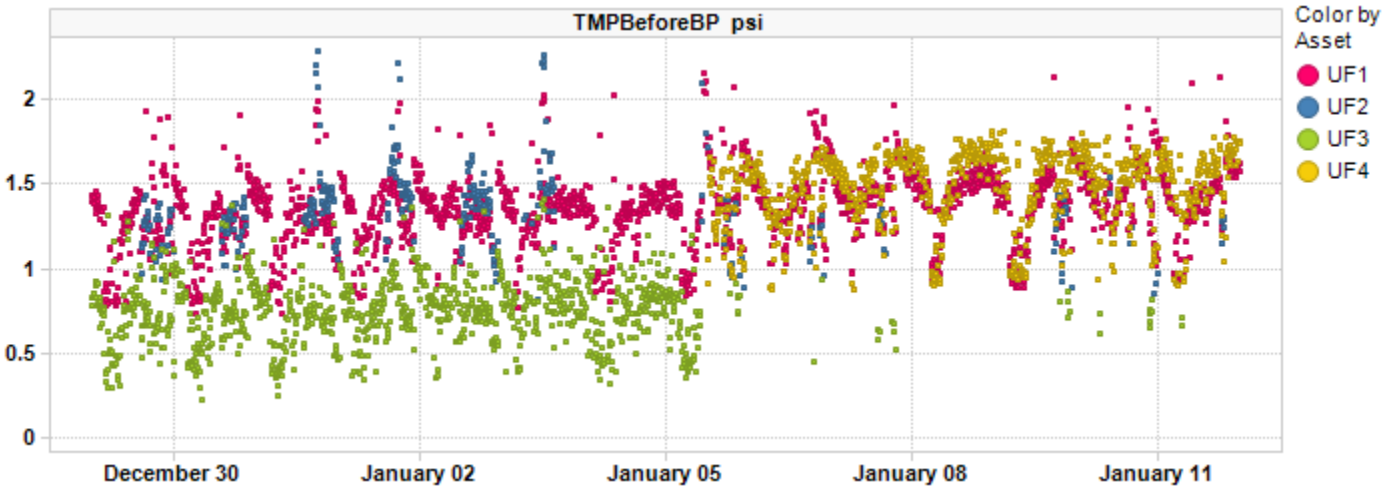
Bioreactor Dissolved Oxygen



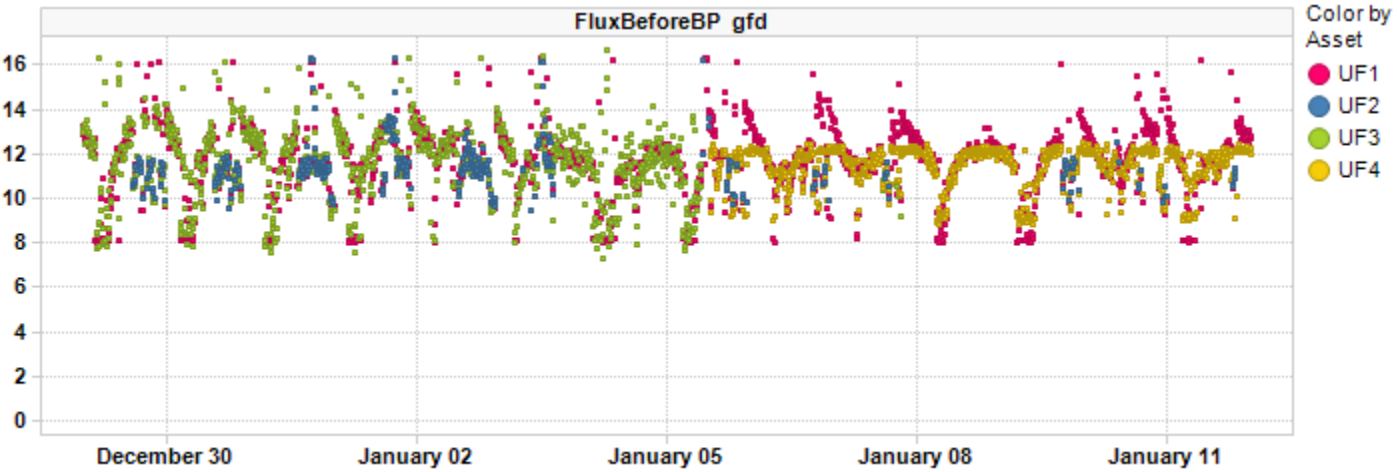
Permeate Turbidity Trend



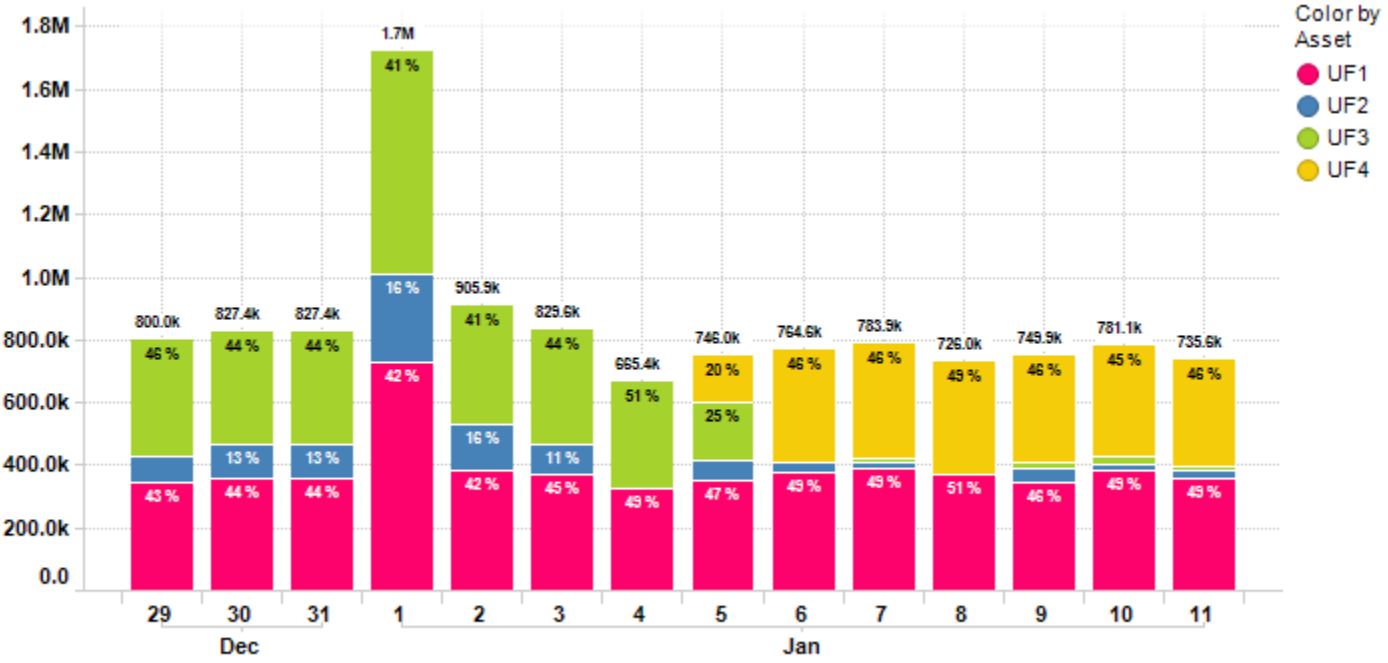
Before BPTMP Trend



Before BP Flux Trend



Daily Permeate Flow



Average Daily permeate flow from 12/29/2021 to 1/11/2022 is 848.8k gal with a maximum daily flow of 1.7M gal.

Asset Summary

KPI Parameters	Value/Change	UF1	UF2	UF3	UF4
FluxBeforeBP gfd	Value	11.65	11.42	11.57	11.45
	Change	-3.44 %	-4.18 %	-3.86 %	1.41 %
FluxDuringBP gfd	Value	18.81	18.58	18.57	18.64
	Change	-0.01 %	0.61 %	-0.08 %	-0.53 %
PermeateTurbidityAfterBP NTU	Value	0.06	0.14	0.07	0.09
	Change	7.61 %	15.69 %	13.32 %	-14.14 %
TCPermeabilityBeforeBP gfd/psi	Value	9.62	9.24	17.29	9.09
	Change	-1.43 %	0.03 %	5.21 %	-76.08 %
TMPBeforeBP psi	Value	1.36	1.35	0.75	1.48
	Change	1.60 %	-6.10 %	-9.39 %	48.50 %
TotalPermeateFlowDaily gal	Value	388.94k	78.47k	224.29k	250.78k
	Change	5.29 %	8.64 %	-10.53 %	60.49 %

Plant Summary

KPI Parameters	Value/Change	UF Plant
PermeateTemperature °F	Value	59.46
	Change	-5.57 %
TotalPermeateFlowDaily gal	Value	927.52k
	Change	9.22 %

Contract Expiry Date : **08/11/2021**

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LEWES BPW WWTP Biweekly InSight Report

Date: 12/29/2021

From: Erin Horocholyn - Suez Water Technologies & Solutions
To: Austin Calaman BPW, Inframark
cc: Matt Stapleford - Suez Water Technologies & Solutions

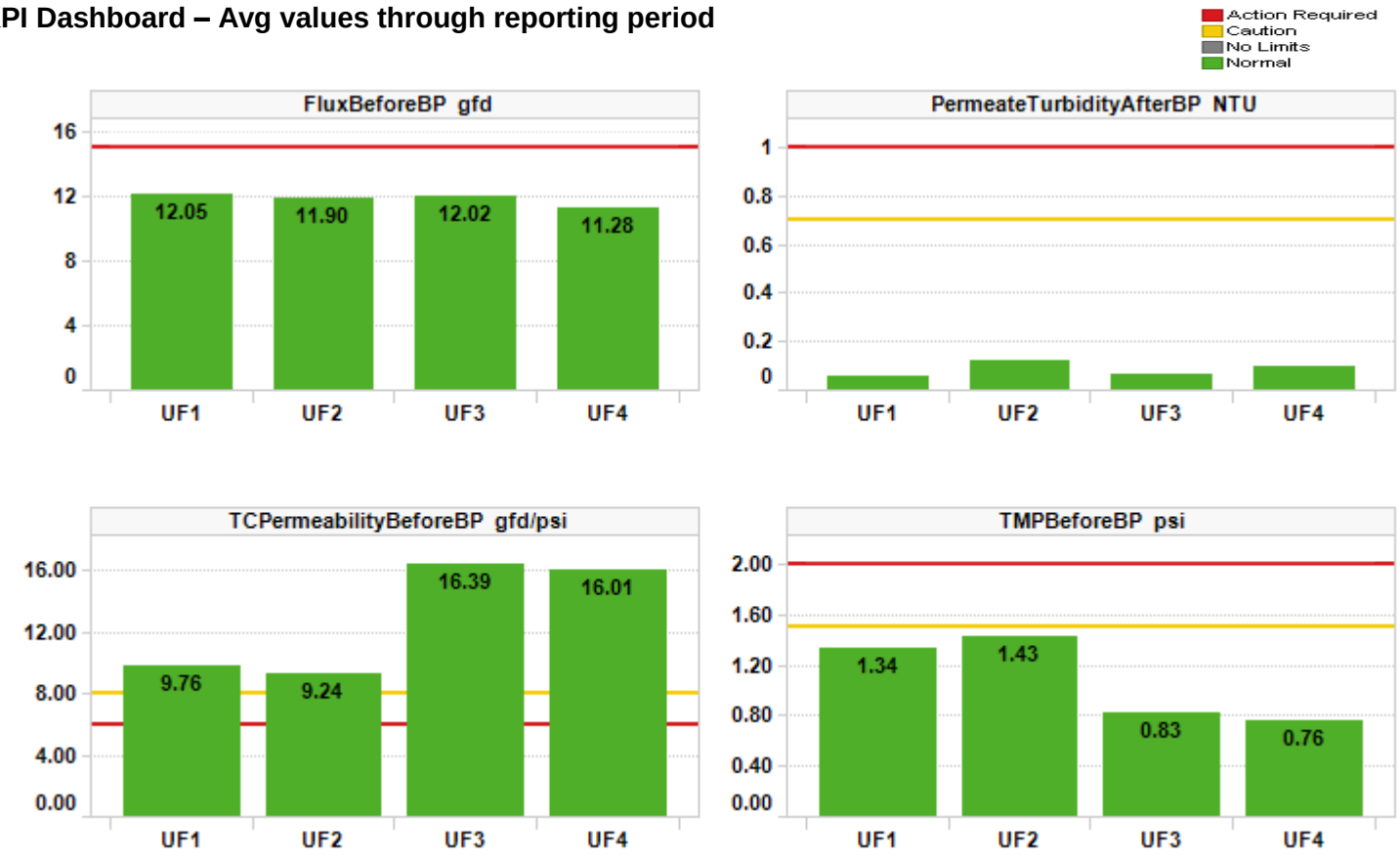
System Equipment

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 trains UF3 and UF4

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



Plant Summary

All trains are operating well overall. Permeability was >8.0 gfd/psi on all trains which is excellent. TMPs were close to or less than 1 psi on all trains. Turbidity was stable and low.

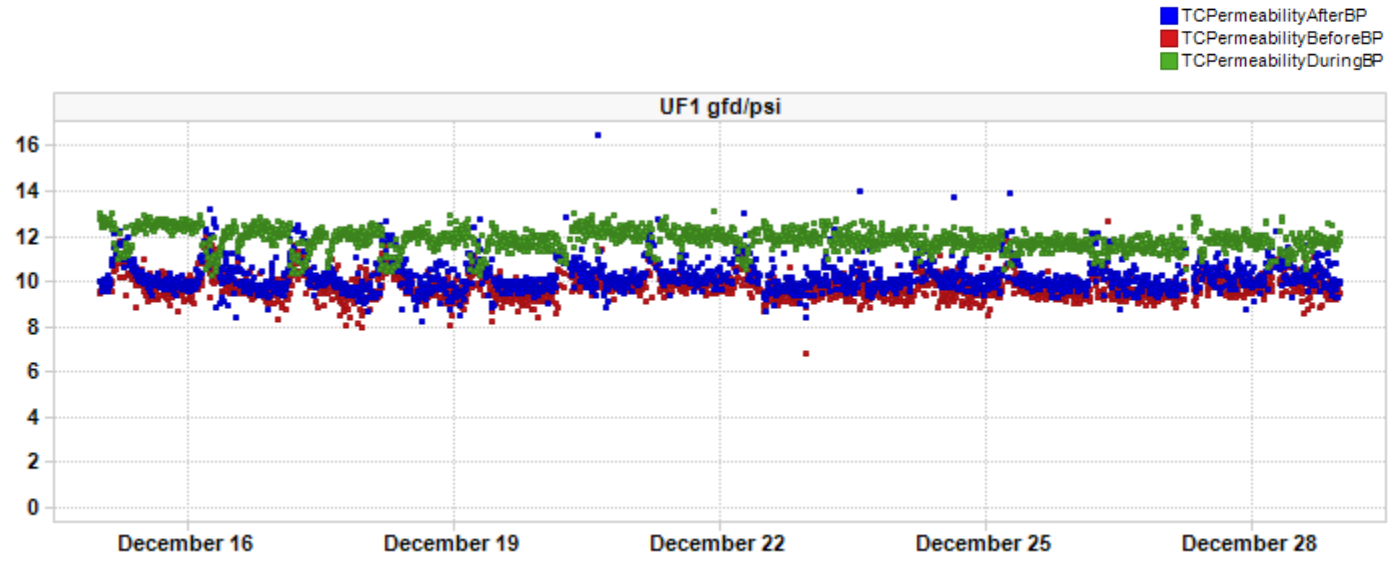
- Daily permeate production averaged 0.77 MGD. UF1 and UF3 or UF4 produced the majority of permeate. UF2 produced <10% of daily permeate except on Dec 22 and 23. UF4's production was shifted to UF3 on Dec 19. Permeate temperature averaged 63°F (-0°F). All online trains are in Backpulse with constant LEAP Hi aeration
- TMP BBP was good, averaging <1.0 psi on UF3 and UF4. UF1 and UF2's TMP averaged 1.3 and 1.4 psi
- TC permeability BBP averages were excellent and >8 gfd/psi. UF1, UF2, UF3, and UF4 averaged 10, 9, 16, and 16 gfd/psi respectively
- Permeate turbidity ABP averages ranged from 0.06 – 0.12 NTU with stable trends on all online trains

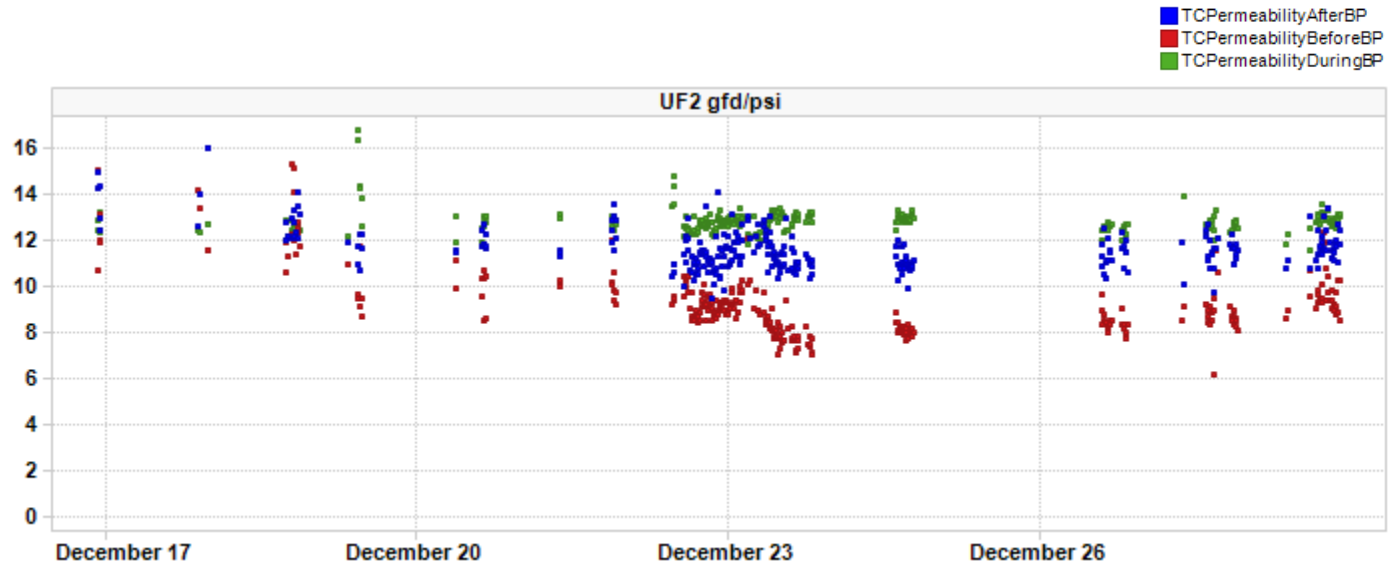
Table 1. Record of maintenance cleans (MCs) run.

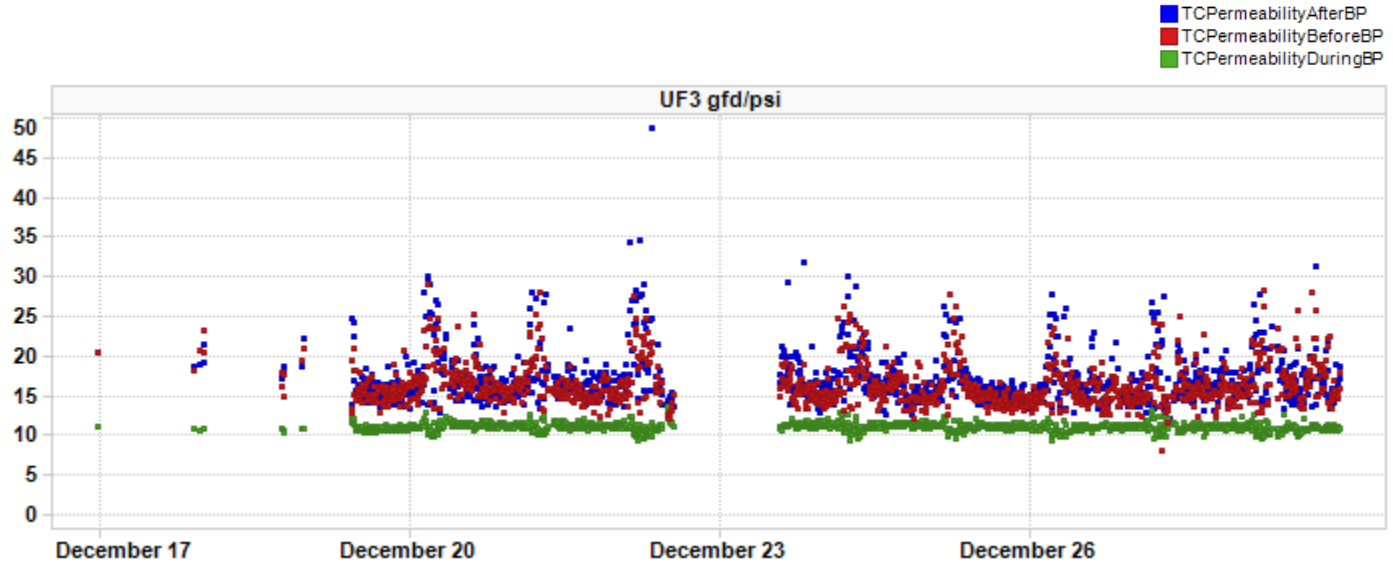
Train	UF1	UF2	UF3	UF4
# of Hypochlorite MCs	2	1	2	0
# of Citric Acid MCs	2	2	2	0

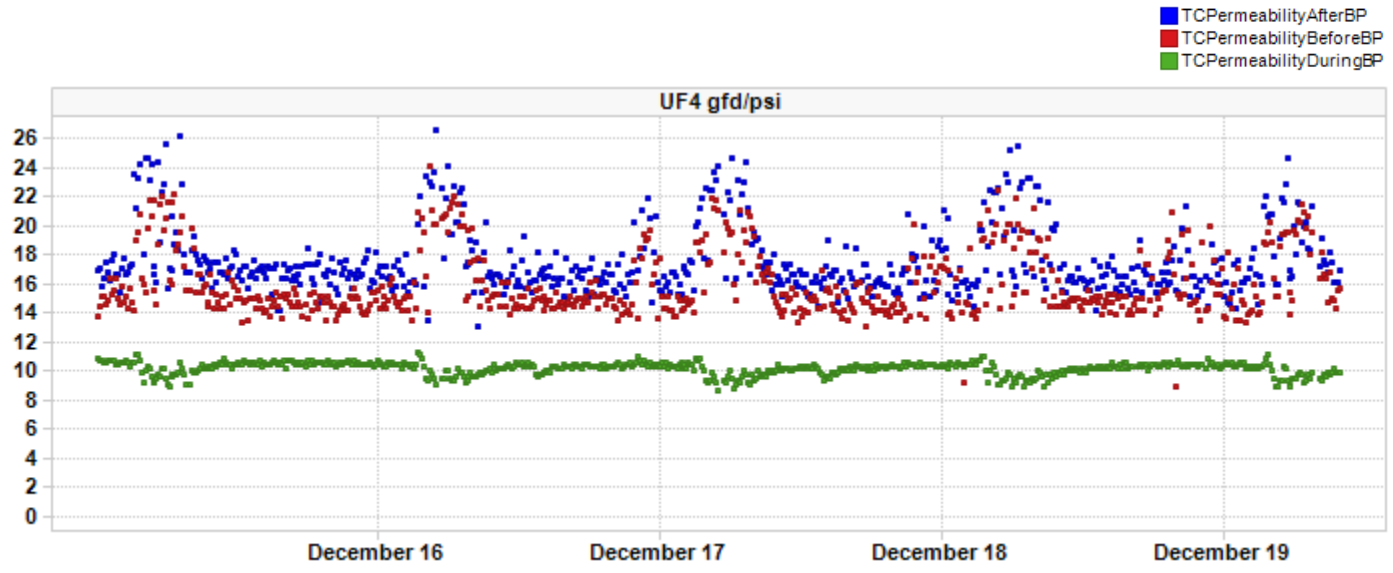
- Aerobic tank 1 dissolved oxygen averaged 0.70 ppm (+0.1 ppm) which may be low for aerobic biology. Tank 2 averaged 1.96 ppm which is a good and economical level. The pre-anoxic zone's DO averages were 0.79 ppm in tank 1, and 1.42 ppm in tank 2 which may be high for nitrification

TC Permeability Trends By Train

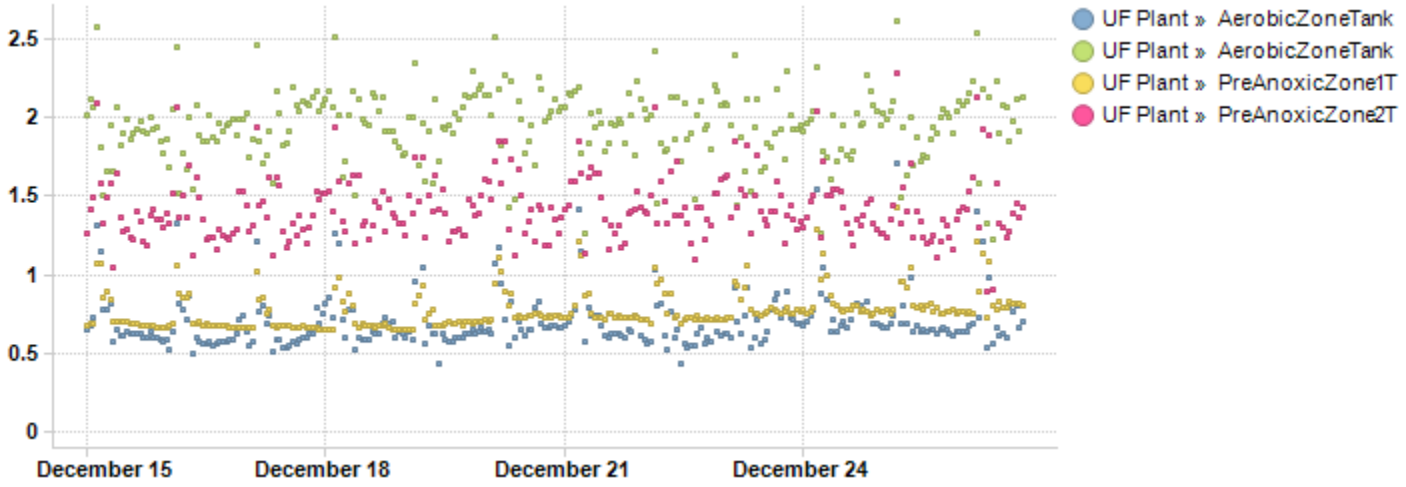



TCPermeabilityAfterBP
TCPermeabilityBeforeBP
TCPermeabilityDuringBP
UF2 gfd/psi
16
14
12
10
8
6
4
2
0
December 17
December 20
December 23
December 26

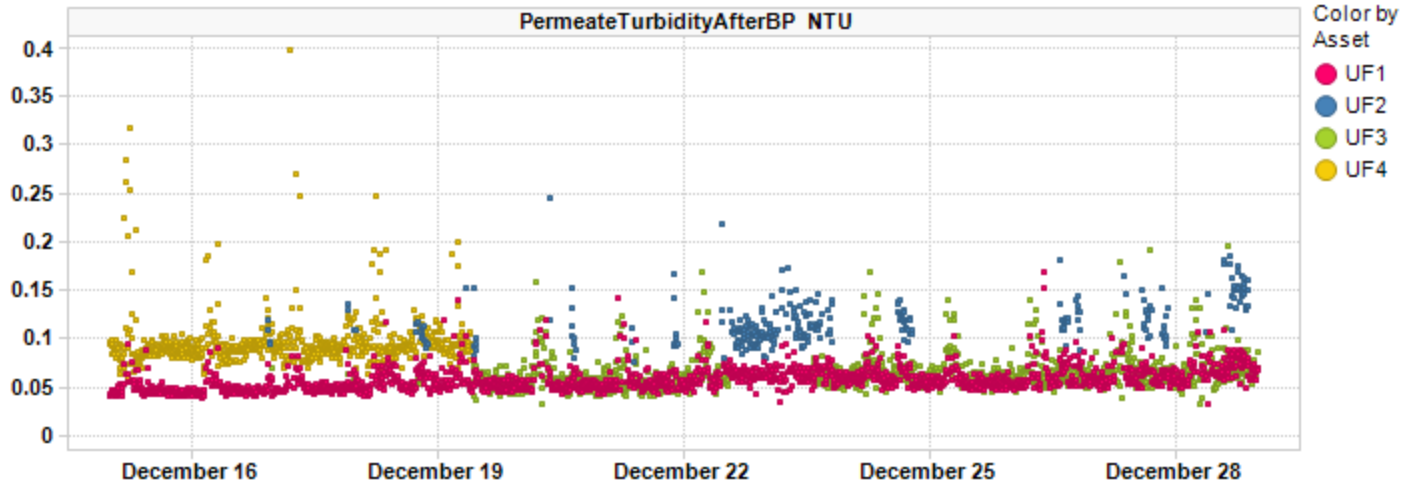

TCPermeabilityAfterBP
TCPermeabilityBeforeBP
TCPermeabilityDuringBP
UF3 gfd/psi
50
45
40
35
30
25
20
15
10
5
0
December 17
December 20
December 23
December 26


TCPermeabilityAfterBP
TCPermeabilityBeforeBP
TCPermeabilityDuringBP
UF4 gfd/psi
26
24
22
20
18
16
14
12
10
8
6
4
2
0
December 16
December 17
December 18
December 19

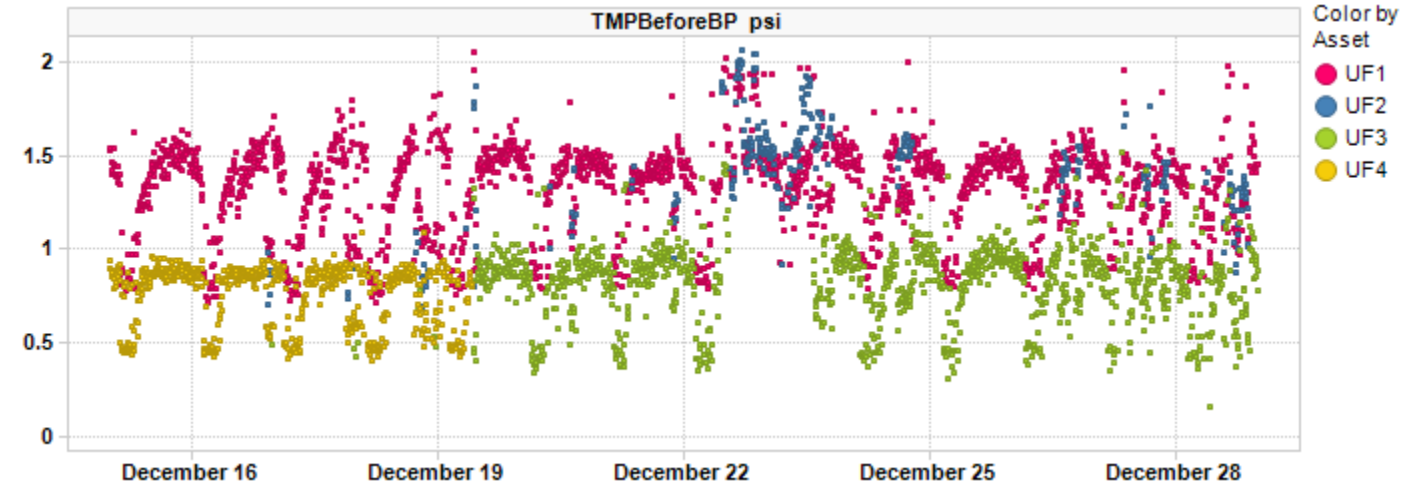
Bioreactor Dissolved Oxygen



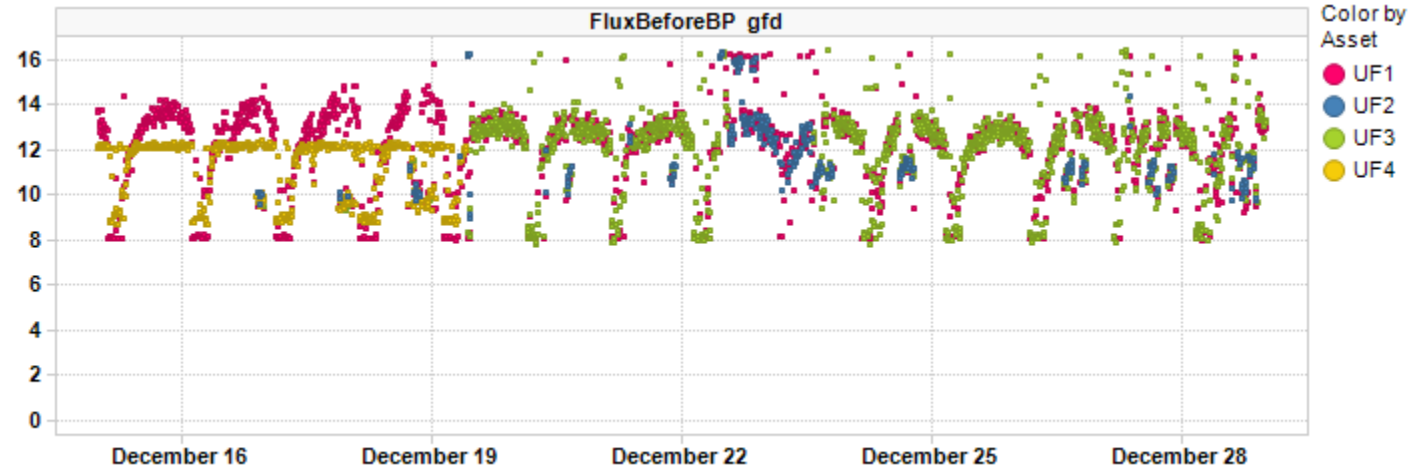
Permeate Turbidity Trend



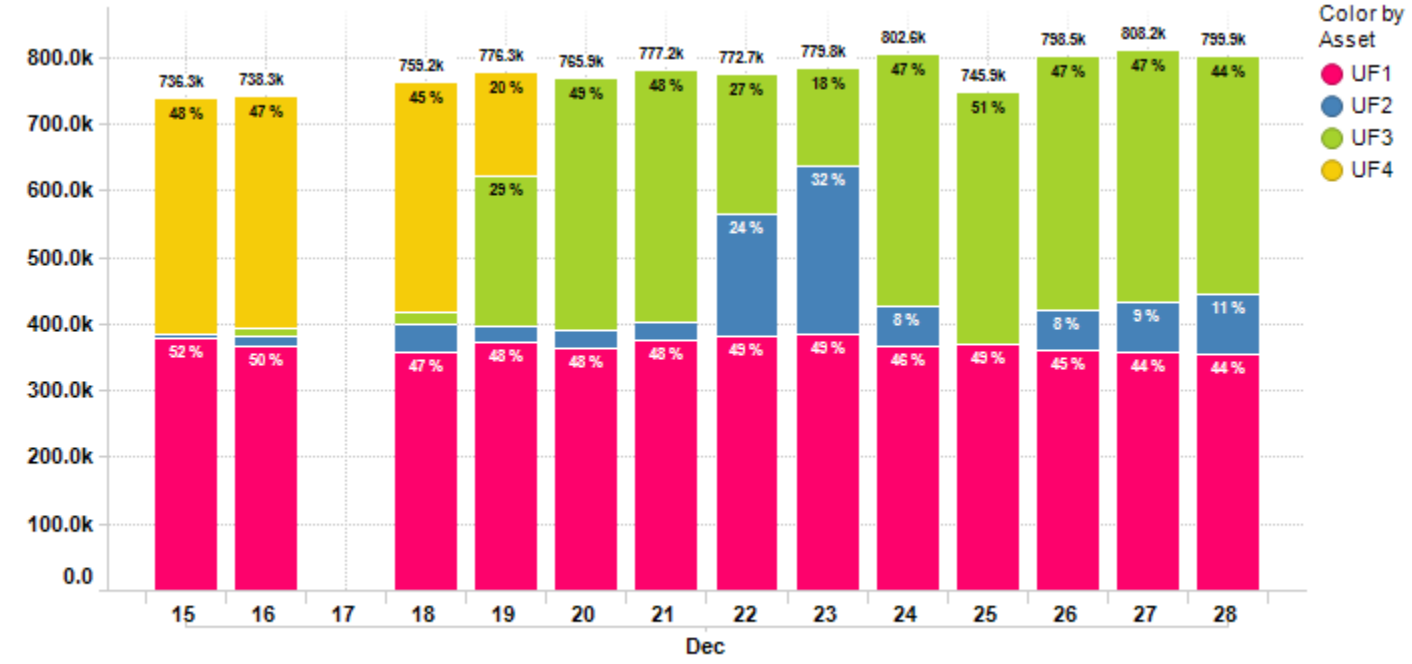
Before BPTMP Trend



Before BP Flux Trend



Daily Permeate Flow



Average Daily permeate flow from 12/15/2021 to 12/28/2021 is 773.9k gal with a maximum daily flow of 808.2k gal.

Asset Summary

KPI Parameters	Value/Change	UF1	UF2	UF3	UF4
FluxBeforeBP gfd	Value	12.05	11.90	12.02	11.28
	Change	5.32 %	10.15 %	19.04 %	3.31 %
FluxDuringBP gfd	Value	18.81	18.47	18.58	18.74
	Change	0.02 %	0.11 %	0.07 %	-0.05 %
PermeateTurbidityAfterBP NTU	Value	0.06	0.12	0.06	0.10
	Change	-4.78 %	4.45 %	-13.95 %	-10.78 %
TCPermeabilityBeforeBP gfd/psi	Value	9.76	9.24	16.39	16.01
	Change	-3.40 %	-19.47 %	-28.77 %	-5.80 %
TMPBeforeBP psi	Value	1.34	1.43	0.83	0.76
	Change	9.02 %	26.94 %	38.04 %	7.20 %
TotalPermeateFlowDaily gal	Value	368.38k	71.69k	247.90k	99.07k
	Change	14.23 %	29.85 %	69.16 %	-200.28 %

Plant Summary

KPI Parameters	Value/Change	UF Plant
PermeateTemperature °F	Value	62.80
	Change	-1.01 %
TotalPermeateFlowDaily gal	Value	841.97k
	Change	2.41 %

Contract Expiry Date : **08/11/2021**

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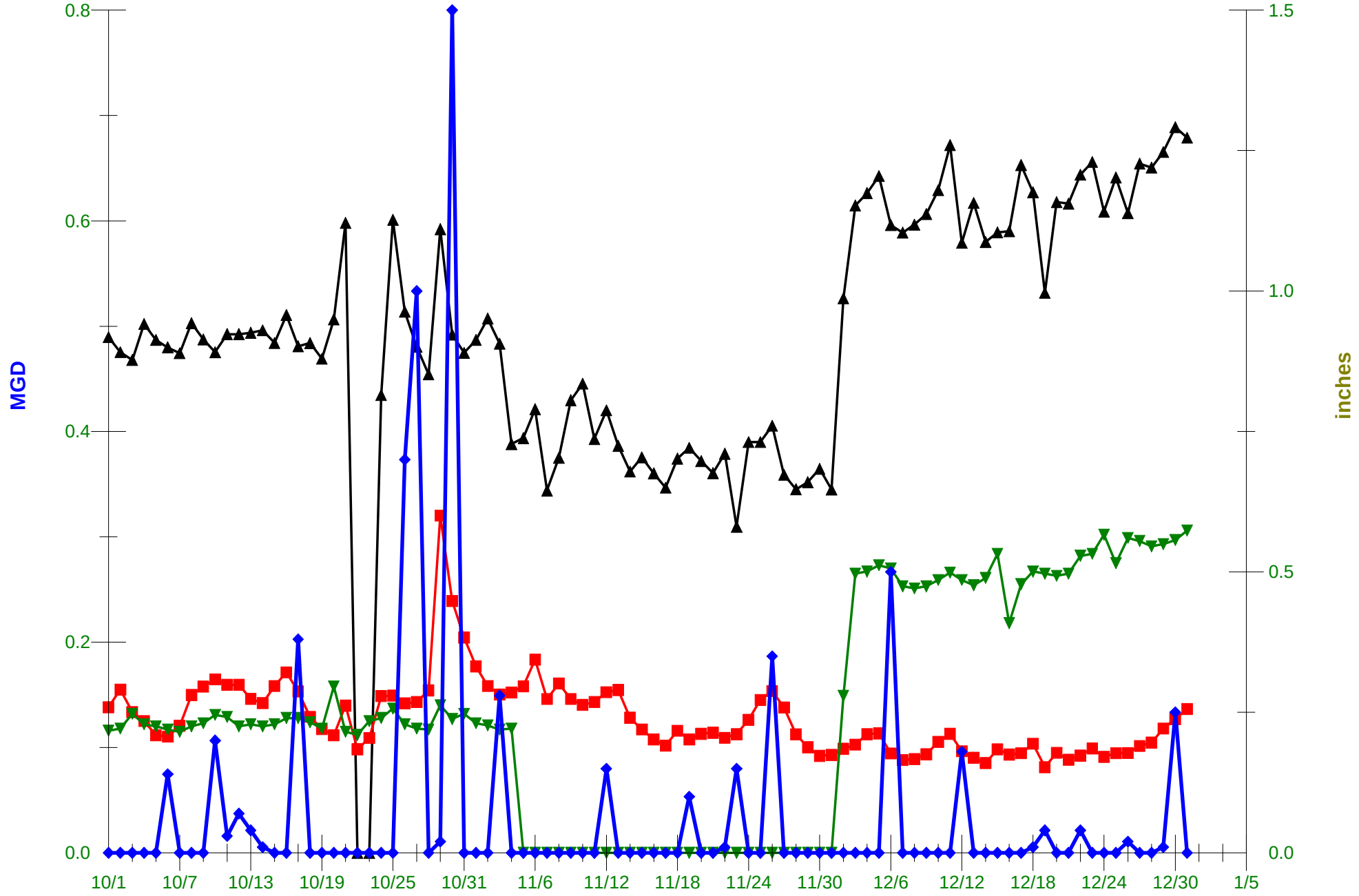
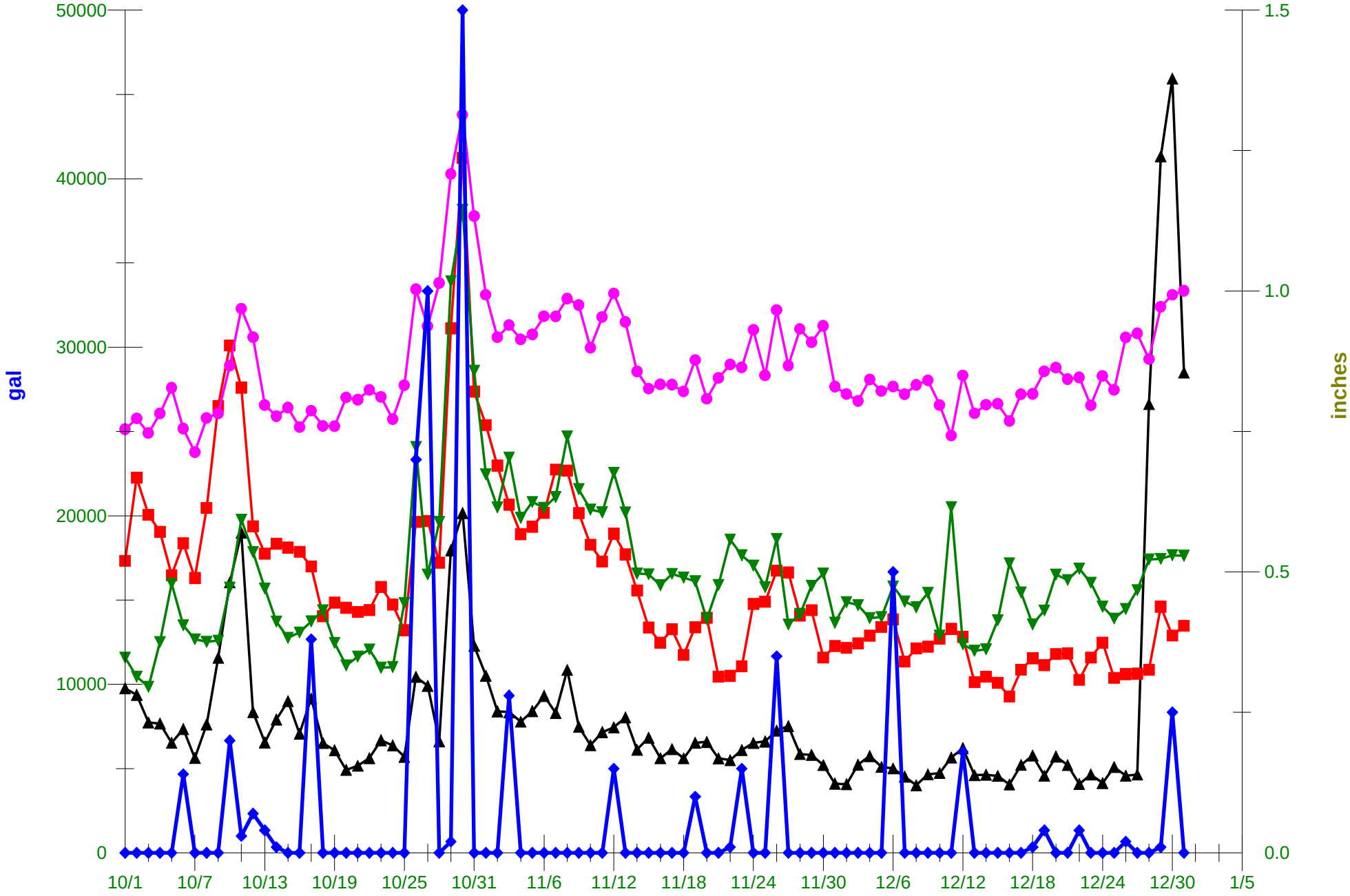
Data Over Time



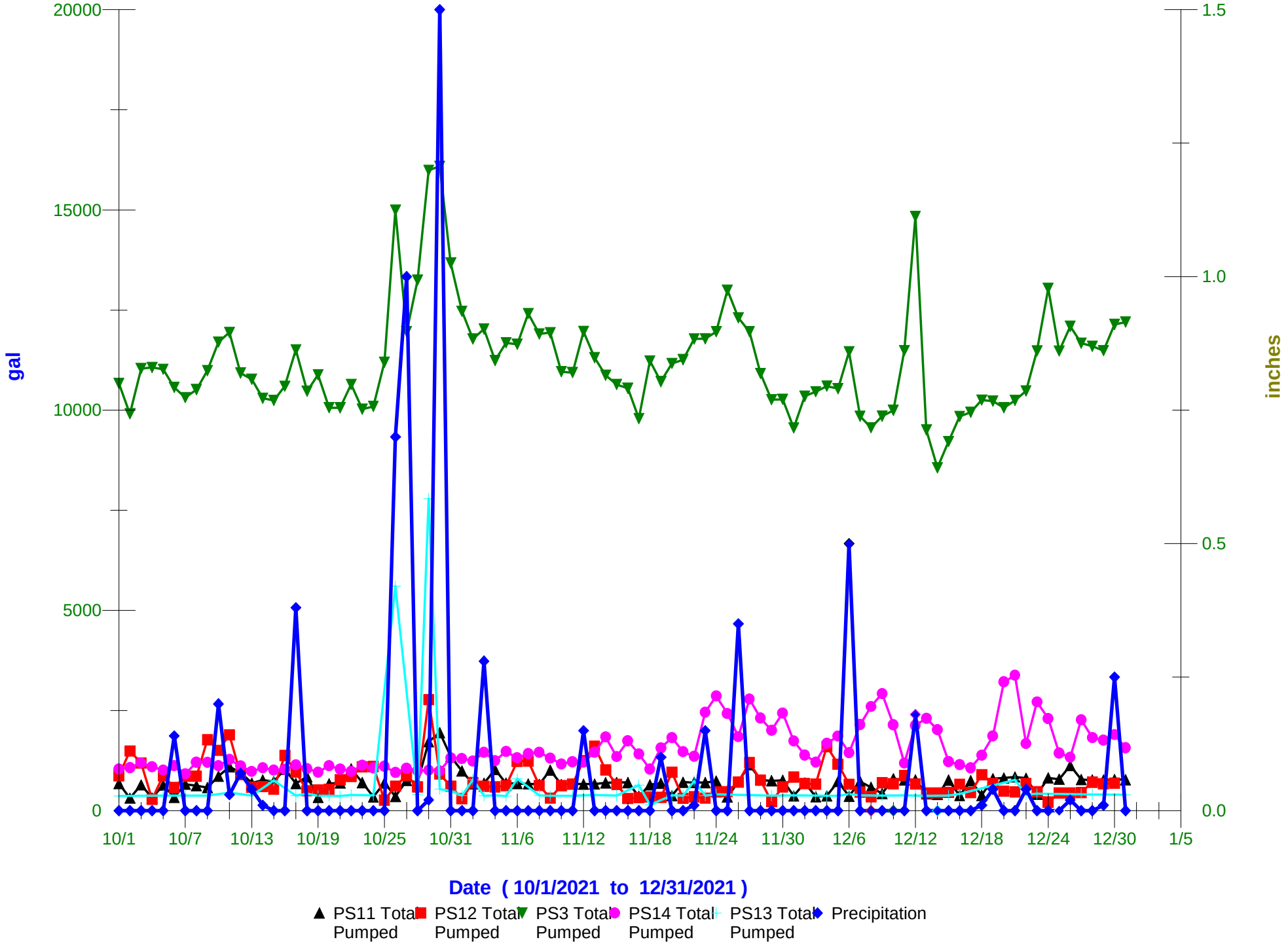
PS4,8 +County

Data Over Time



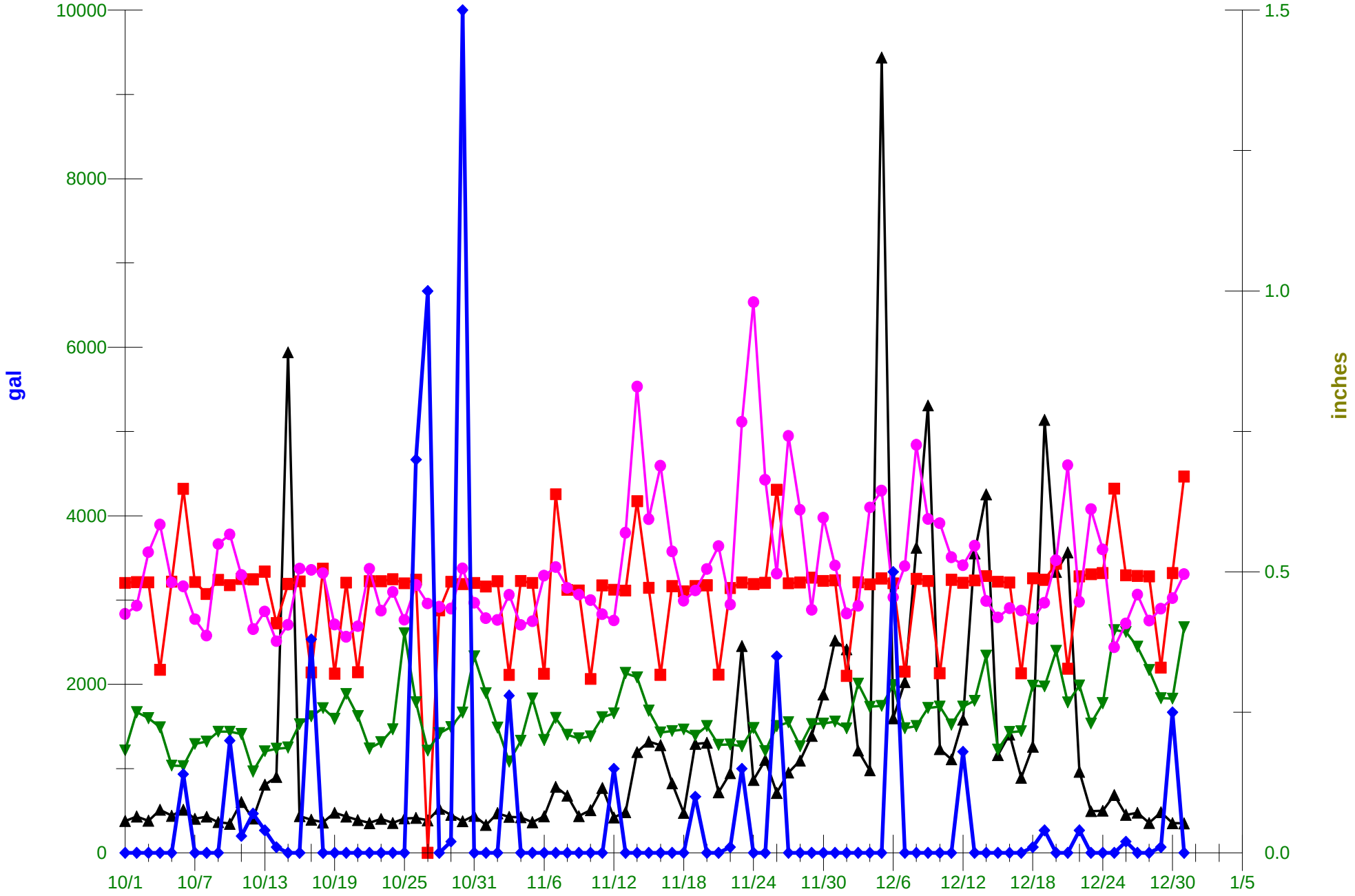
PS1,2,5,6

Data Over Time



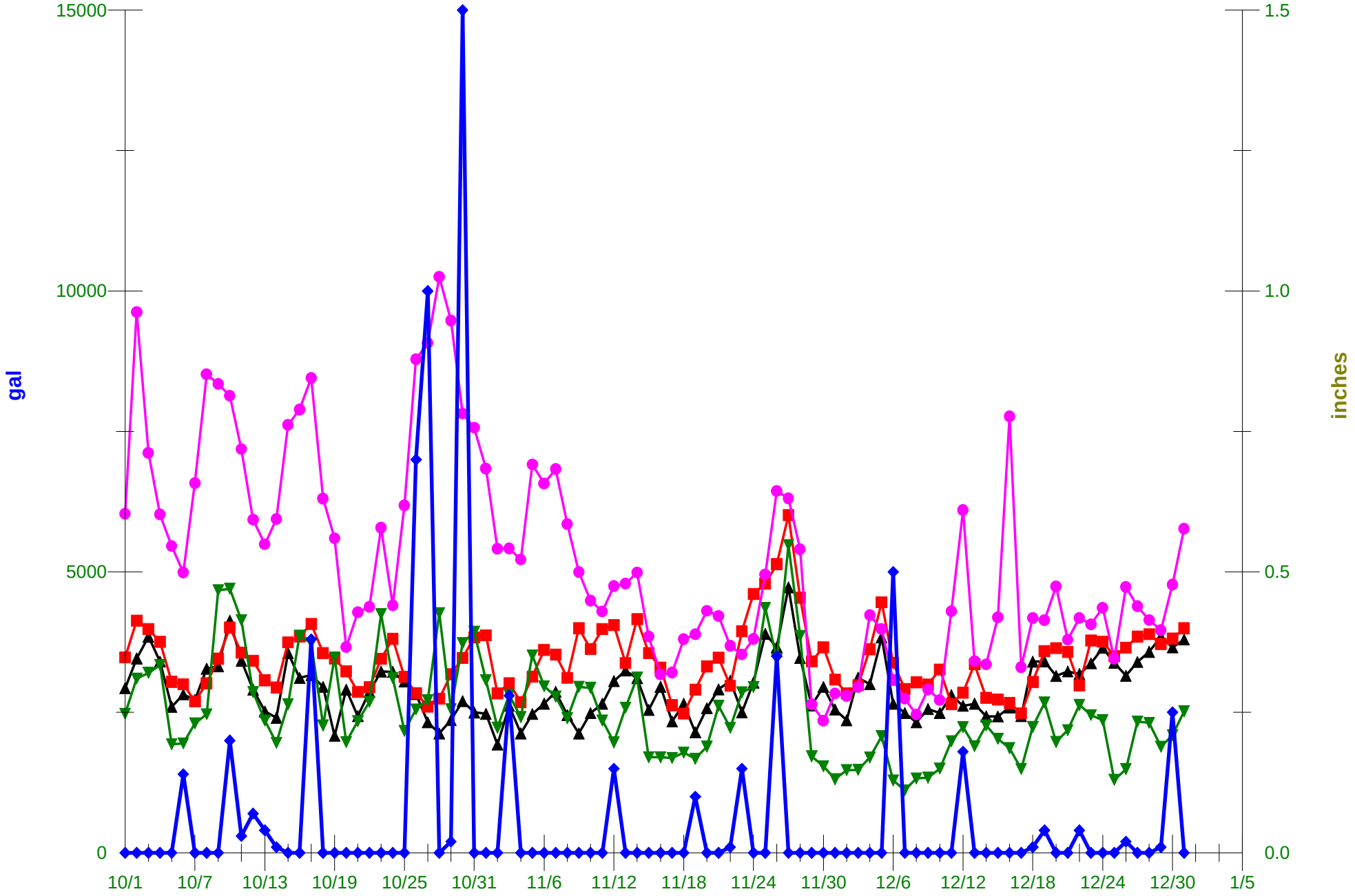
PS3,11,12,13,14

Data Over Time



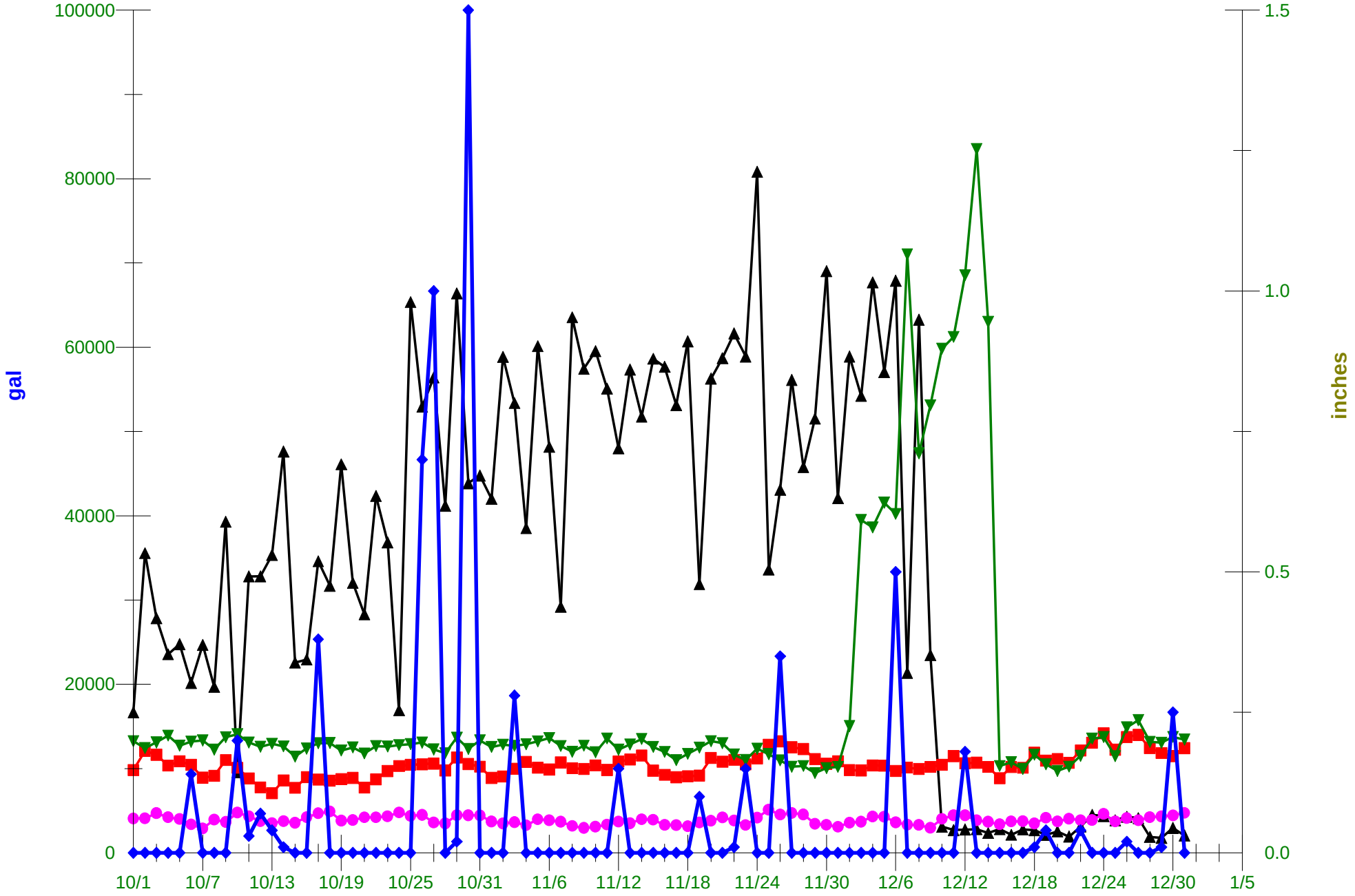
PS16,17,17b,18

Data Over Time



PS7.15,83,74

Data Over Time



PS9,10,19,32