PARSONS

ENGINEERING REPORT
OLD OUTFALL 002 GAC PILOT STUDY RESULTS ADDENDUM
CHEMOURS FAYETTEVILLE PLANT
FAYETTEVILLE, NORTH CAROLINA

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APPENDICES

ACRONYMS

Acronym	Definition / Description
Chemours	The Chemours Company FC, LLC
CO	Consent Order
DWR	(NCDEQ) Division of Water Resources
EPA	Environmental Protection Agency
F400	(Calgon) Filtrasorb 400
GAC	Granular activated carbon
g/L	Gram(s) per liter
gpm	Gallon(s) per minute
HFPO-DA	Hexafluoropropylene oxide dimer acid
L/min	Liter(s) per minute
µg/L	Microgram(s) per liter
mg/L	Milligram(s) per liter
NCDEQ	North Carolina Department of Environmental Quality
NPDES	National Pollutant Discharge Elimination System
OOF2	Old Outfall 002
PFAS	Perfluoroalkyl and polyfluoroalkyl substances
PFMOAA	Perfluoro-2-methoxyacetic acid
PMPA	Perfluoromethoxypropionic acid

1.0 INTRODUCTION

Parsons performed a pilot study to demonstrate the effectiveness of using GAC adsorption for removal of indicator PFAS compounds in Old Outfall 002 (OOF2) as required by paragraph 12.e of the February 25, 2019 Consent Order (CO) entered by The Chemours Company FC, LLC (Chemours) with the State of North Carolina and Cape Fear River Watch. The pilot study was conducted over a 3-month period from June through September 2019. Parsons prepared the Engineering Report - Old Outfall 002 GAC Pilot Study Results (September 2019) presenting and summarizing analytical data available at the time the study was completed. Parsons has prepared this addendum to present and summarize the remaining analytical data which has become available since issuance of the September 2019 Engineering Report.

2.0 BACKGROUND

The September 2019 Engineering Report provides the background, technical approach, and results available at the time of report issuance for the OOF2 pilot study required under Paragraph 12.e of the CO. The results available at the time the Engineering Report was issued included data collected from June 14 through August 27, 2019. This addendum supplements the September 2019 Engineering Report with remaining analytical data from August 27 through September 14, 2019, which covers the balance of samples collected during the 2nd test phase (Test #2) which compared Calgon Filtrasorb 400 (F400) GAC (Test 2A) and DSR-A (Test 2B), a regenerated GAC product also from Calgon. The remaining results for Test #2 are summarized below and presented in the following appendices:

- Appendix A – Conventional parameter figures.
- Appendix B – Comprehensive PFAS treatment results tables.
- Appendix C – Breakthrough curves for PFMOAA, HFPO-DA, and select additional parameters demonstrating progression of treatment through the GAC columns.

The figures in Appendix A and Appendix C are shown for the entirety of Test #2 but delineated to indicate additional data available since issuance of the September 2019 Engineering Report.

2.1 Sample Points

The sample points were identified as follows:

Sample Point #	Sample Point ID	Description
SP-1	INF	Untreated Stored Influent
SP-2	PRE-A	Pretreated/Filtered Batch ('A' Train)
SP-3	GAC 1A	Column 1 Effluent ('A' Train)
SP-4	GAC 2A	Column 2 Effluent ('A' Train)
SP-5	GAC 3A	Column 3 Effluent ('A' Train)
SP-6	GAC 4A	Column 4 Effluent ('A' Train)
SP-7	GAC B	Pretreated/Filtered Batch ('B' Train)
SP-8	GAC 1B	Column 1 Effluent ('B' Train)
SP-9	GAC 2B	Column 2 Effluent ('B' Train)
SP-10	GAC 3B	Column 3 Effluent ('B' Train)
SP-11	GAC 4B	Column 4 Effluent ('B' Train)

2.2 Conventional Parameters

The figures in Appendix A show the removal of Total Organic Carbon (TOC), Total Suspended Solids (TSS), total iron, and soluble iron during pretreatment/filtration and GAC adsorption.

2.3 PFMOAA

Pretreatment. Influent concentrations in Test #2 as analyzed by Chemours' on-site analytical laboratory were measured at an average of around 27 micrograms per liter (µg/L); pretreated and filtered flow concentrations were measured at an average of around 22 – 23 µg/L.

GAC Treatment and Breakthrough

Test 2A (F400 GAC). PFMOAA demonstrated generally similar breakthrough milestones in Test 2A as in Test #1 which also utilized F400 GAC. PFMOAA started to break through F400 in the 1st column (GAC 1A) at around 8,000 liters treated and the carbon appears to have approached saturation at approximately 18,500 L; PFMOAA did not break through Column #2 within this period, a result consistent with Test #1. As such, Test #2 demonstrated repeatability of testing procedures and performance.

Test 2B (DSR-A GAC). PFMOAA broke through DSR-A more rapidly than through F400; breakthrough was observed in all four columns, with effluent concentrations approaching influent levels observed in GAC 1B and GAC 2B even before any breakthrough was detected in the corresponding F400 GAC columns along the 'A' train.

As already discussed in the September 30, 2019 report, the results provided by Chemours' on-site analytical laboratory continued to reflect a low bias. The level of bias compared to analyses performed on field-duplicates by Chemours' contract independent analytical laboratory was consistent with previously-reported findings. The low bias did not affect breakthrough profiles, but a bias factor was applied to calculate utilization projections based on a comparison with split-sample duplicates analyzed by Chemours' contract independent analytical laboratory as described in the September 2019 Engineering Report. Commercial certified laboratory analyses were used for all GAC utilization projections based on isotherm studies.

Estimated GAC Utilization. The September 2019 Engineering Report presented a calculation of estimated GAC utilization based on Test #1 results. The calculation was based on complete exhaustion of the GAC in the first column (GAC 1A) plus the additional utilization of carbon in the second column (GAC 2A) attributed to the PFMOAA present in the effluent from GAC 1A during the same period.

This calculation has been revised for this Addendum as follows:

- Volume treated until saturation: 22,605 L (6,016 gal)
- Mass of carbon in first column (GAC 1A): 2.48 lb
- Total PFMOAA mass loading onto GAC 1A: 1,833 mg
- PFMOAA mass loading onto second column (GAC 2A): 633 mg (due to PFMOAA in GAC 1A effluent during same period)
- NET mass adsorbed onto first column (GAC 1A): 1,833 – 633 mg = 1,200 mg
- Mass loading ratio (x/m) = 1,200 mg/[(2.48 lb)*(453.6 g/lb)] = 1.07 mg per g GAC
- Design basis influent PFMOAA concentration: 85 µg/L
- GAC Usage Rate = (85 µg/L)*(1 mg/1000 µg)/(1.07 mg/g) = 0.079 g/L
- Carbon Utilization in first column (GAC 1A) @ 500 gpm:

  - (0.079 g/L)*(3.785 L/gal)*(500 gal/min)*(1440*365 min/yr)/(453.6 lb/g) = 173,200 lb/yr

- Carbon utilization in second column (GAC 2A) = (633 mg/1,200 mg)*(173,200 lb/yr) = 91,400 lb/yr
- Total GAC Utilization @ 500 gpm = 173,200 + 91,400 lb/yr = 264,600 lb/yr
- Total GAC Utilization @ 750 gpm = (750/500)*264,600 lb/yr = 396,900 lb/yr
- Total GAC Utilization @ 1,000 gpm = (1,000/500)*264,600 = 529,200 lb/yr

These results compare favorably with results from isotherm testing which projects utilization at 750 gpm of approximately 368,000 lb/year. It should be noted that the pilot system consistently demonstrated treatment of > 99% removal of PFMOAA in treated effluent and that the breakthrough information relates directly to how a GAC system would be operated and when GAC would be replenished.

2.4 HFPO-DA and Other Compounds

HFPO-DA. Appendix B provides updated breakthrough profiles for HFPO-DA as well as PFO2HxA, PFO3OA, PFO4DA, PEPA, and PMPA for Test #2. Breakthrough profiles with F400 GAC (Test 2A) were consistent with the profiles observed in Test #1 which also used F400 GAC, demonstrating test repeatability.

As with PFMOAA, the breakthrough profiles for other compounds demonstrated more rapid breakthrough with DSR-A GAC compared to F400 GAC. Although breakthrough rates were more rapid, the profiles demonstrate differing breakthrough rates between compounds. If the more rapid breakthrough had been due to short-circuiting (i.e., water flowing along unintended pathways such as fissures in the carbon beds or along the column walls due to blockages or insufficient column diameter), then the breakthrough rates would have been similar between compounds. Therefore, Parsons has concluded that the more rapid breakthrough in DSR-A was due primarily to differences in adsorption kinetics and capacity in DSR-A compared to F400 GAC.

Projected GAC utilization from Test #1 for PMPA, as presented in the September 2019 Engineering Report, was re-calculated as follows using the same bias factors as presented in the Engineering Report:

- Volume treated until saturation: 19,802 L (5,232 gal)
- Mass of carbon in first column (GAC 1A): 2.48 lb
- PMPA mass loading onto GAC 1A: 97.4 mg
- PMPA mass loading onto second column (GAC 2A): 32.9 mg (due to PMPA in GAC 1A effluent during same period)
- NET mass adsorbed onto GAC 1A = 97.4 – 32.9 mg = 64.5 mg
- Mass loading ratio (x/m) = 64.5 mg/[(2.48 lb)*(453.6 g/lb)] = 0.057 mg per g GAC
- Design basis influent PMPA concentration: 5.4 µg/L
- GAC Usage Rate = (5.4 µg/L)*(1 mg/1000 µg)/(0.057 mg/g) = 0.095 g/L
- Carbon Utilization in first column (GAC 1A) @ 500 gpm:
  - (0.095 g/L)*(3.785 L/gal)*(500 gal/min)*(1440*365 min/yr)/(453.6 lb/g) = 208,300 lb/yr

- PMPA mass loading onto second column (GAC 2A) = 32.9 mg (due to PMPA in GAC 1A effluent during same period)
- Carbon utilization in second column = (32.9 mg/64.5 mg)*(136,700 lb/yr) = 106,200 lb/yr
- Total GAC Utilization @ 500 gpm = 208,300 + 106,200 lb/yr = **314,500 lb/yr**
- Total GAC Utilization @ 750 gpm = (750/500)*314,500 lb/yr = **471,800 lb/yr**
- Total GAC Utilization @ 1,000 gpm = (1,000/500)*182,950 = **629,000 lb/yr**

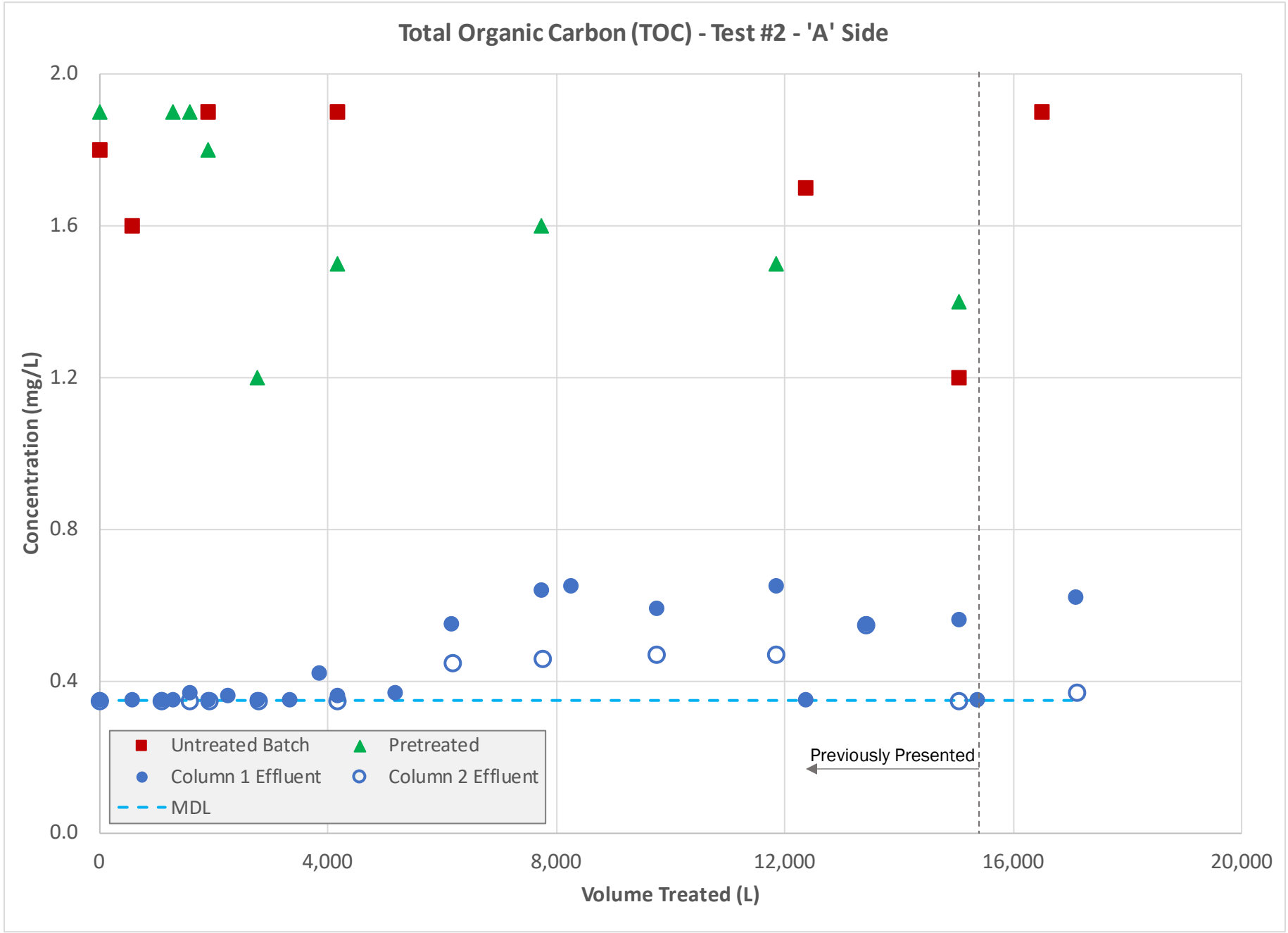
As with PFMOAA, PMPA was consistently removed by > 99% in GAC-treated effluent prior to breakthrough. It should be noted that influent concentrations of PMPA are over an order of magnitude lower than influent rates of PFMOAA.

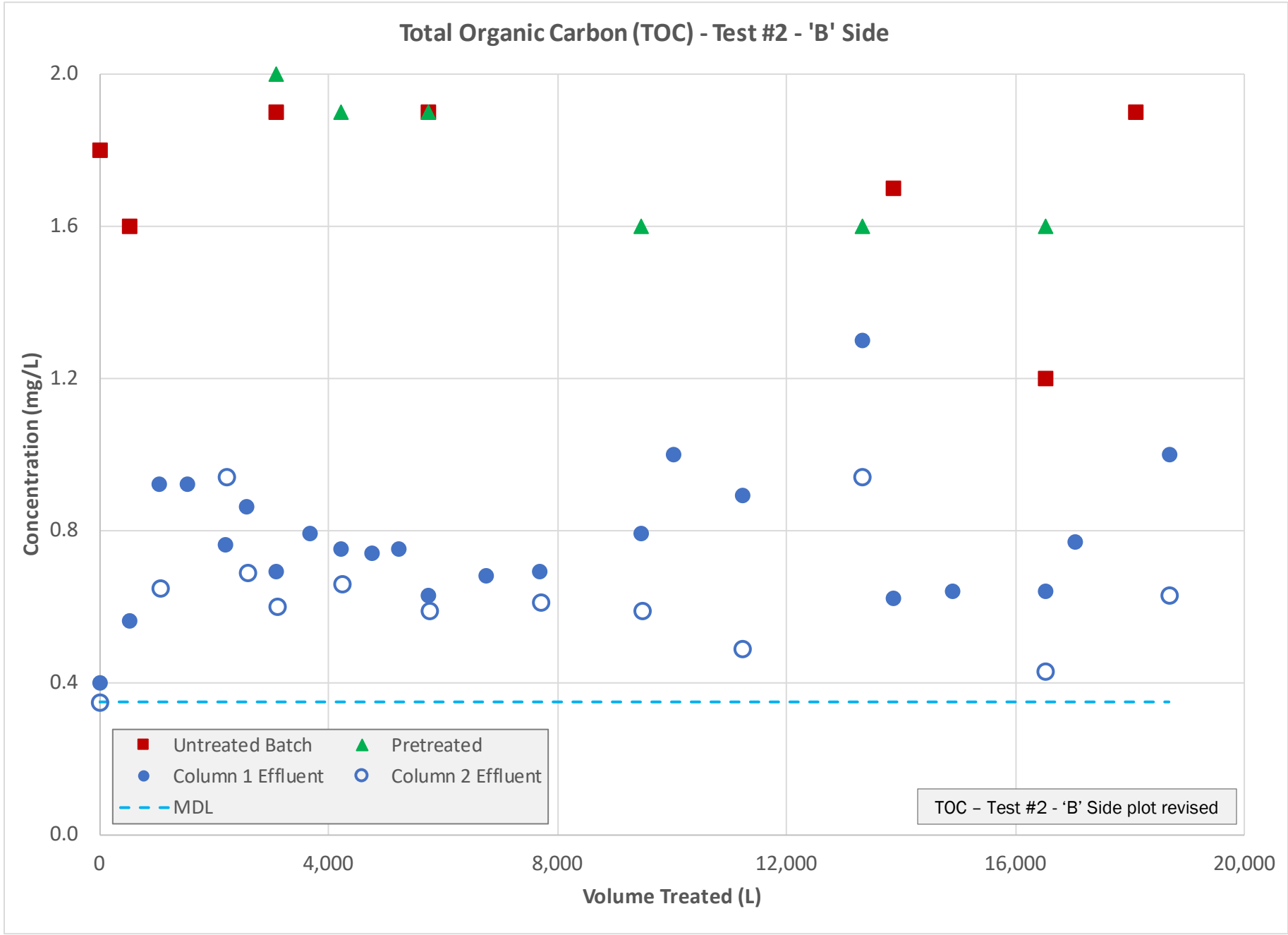
3.0 PILOT TREATMENT TEST CONCLUSIONS

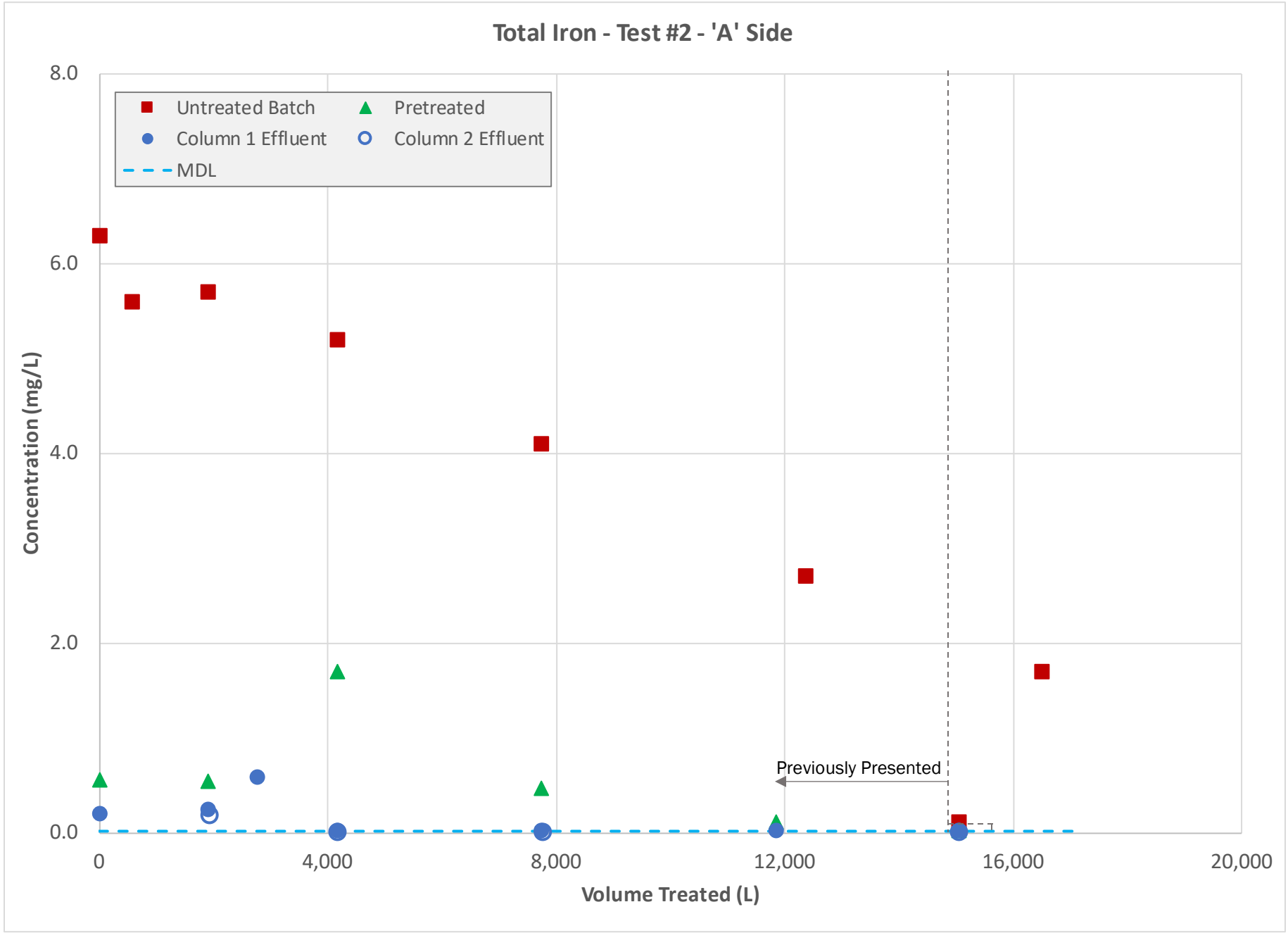
The conclusions presented in the September 2019 Engineering Report did not change except for the following revisions on estimated GAC utilization.

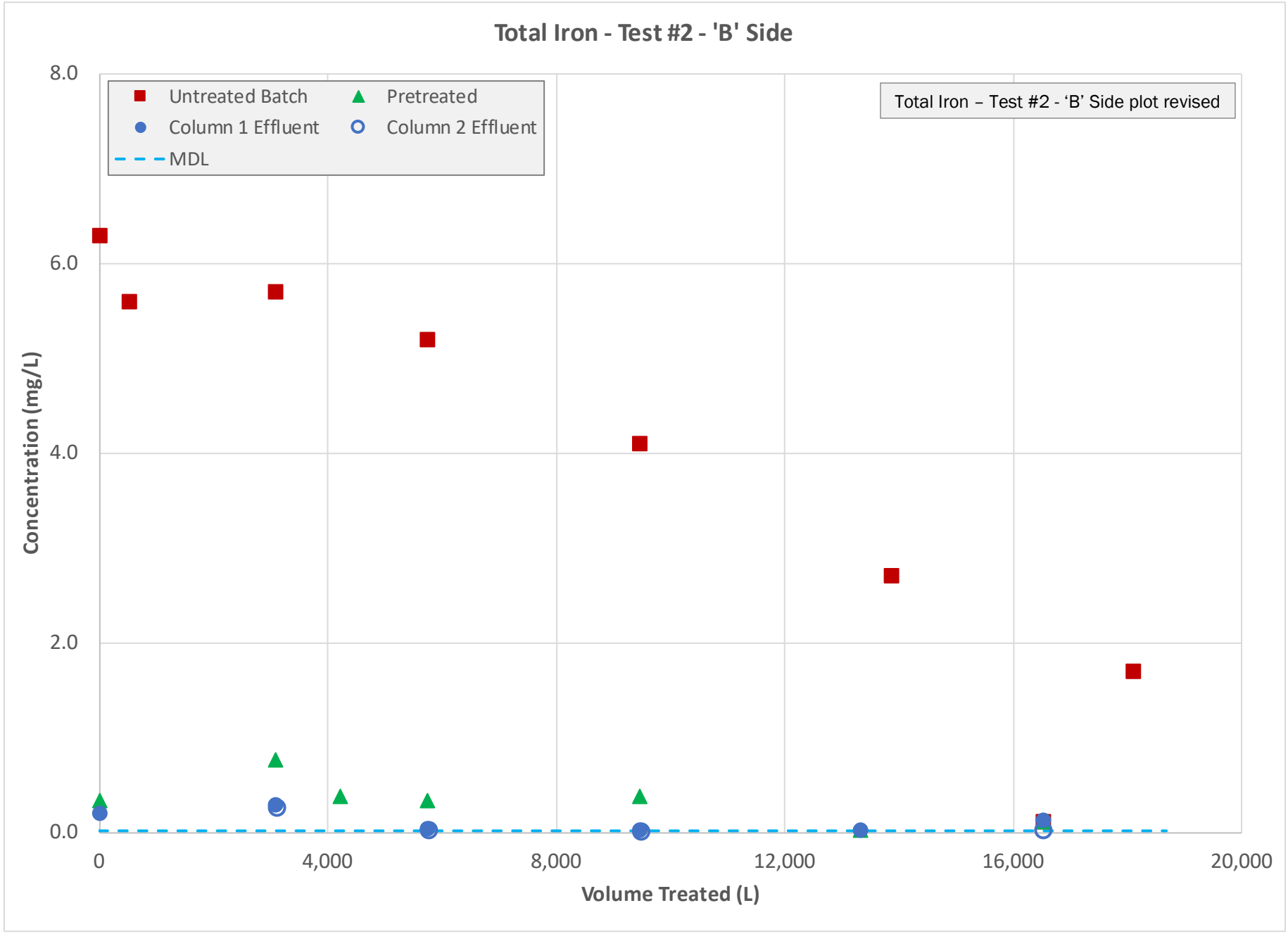
- Estimated F400 GAC utilization based on PFMOAA treatment was 267,000 to 534,000 pounds/year for a flow rate of 500 to 1,000 gpm.
- Estimated F400 GAC utilization based on PMPA treatment was 315,000 to 629,000 pounds/year based on a flow rate of 500 to 1,000 gpm.

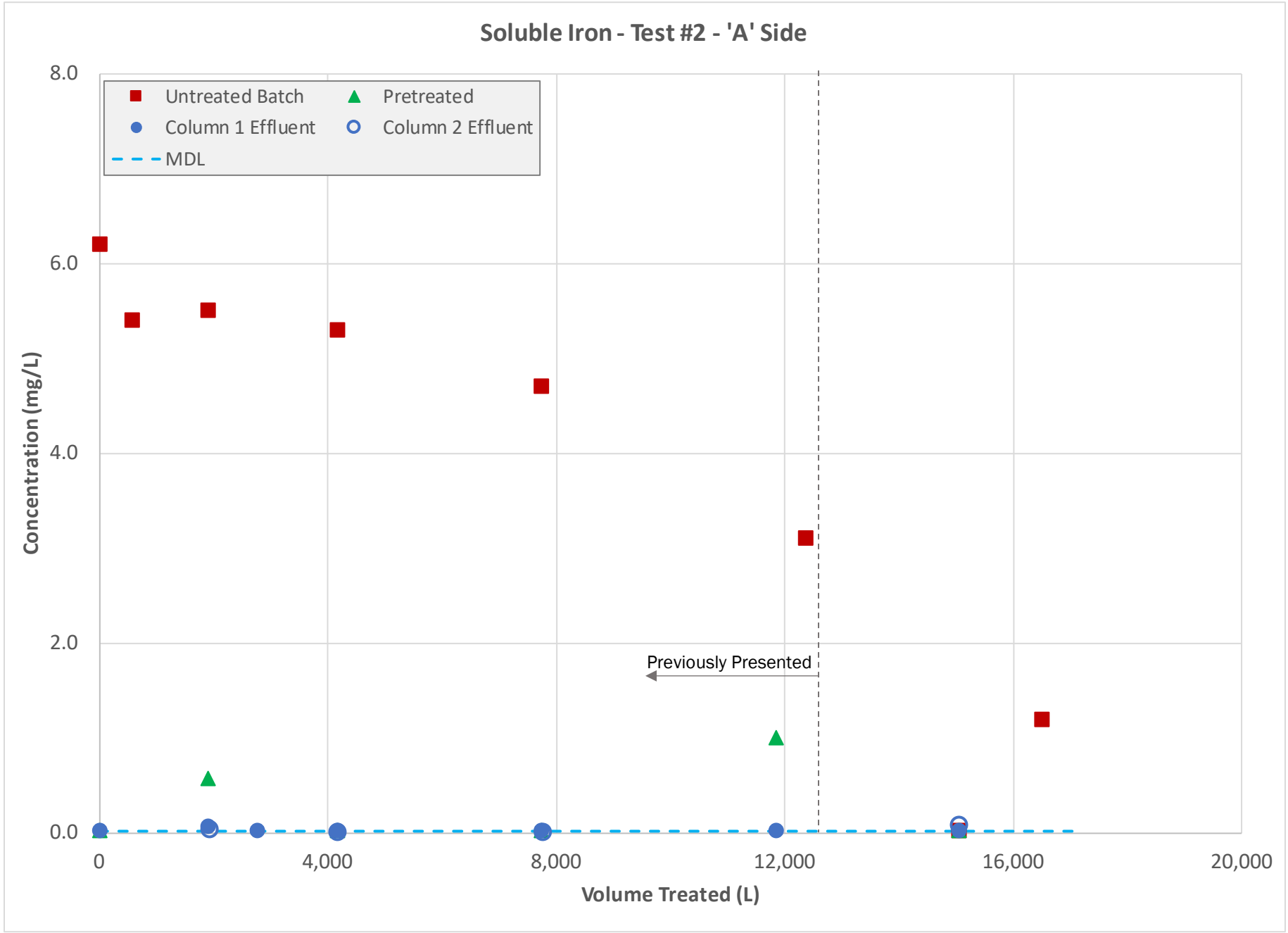
APPENDIX A
CONVENTIONAL PARAMETER FIGURES

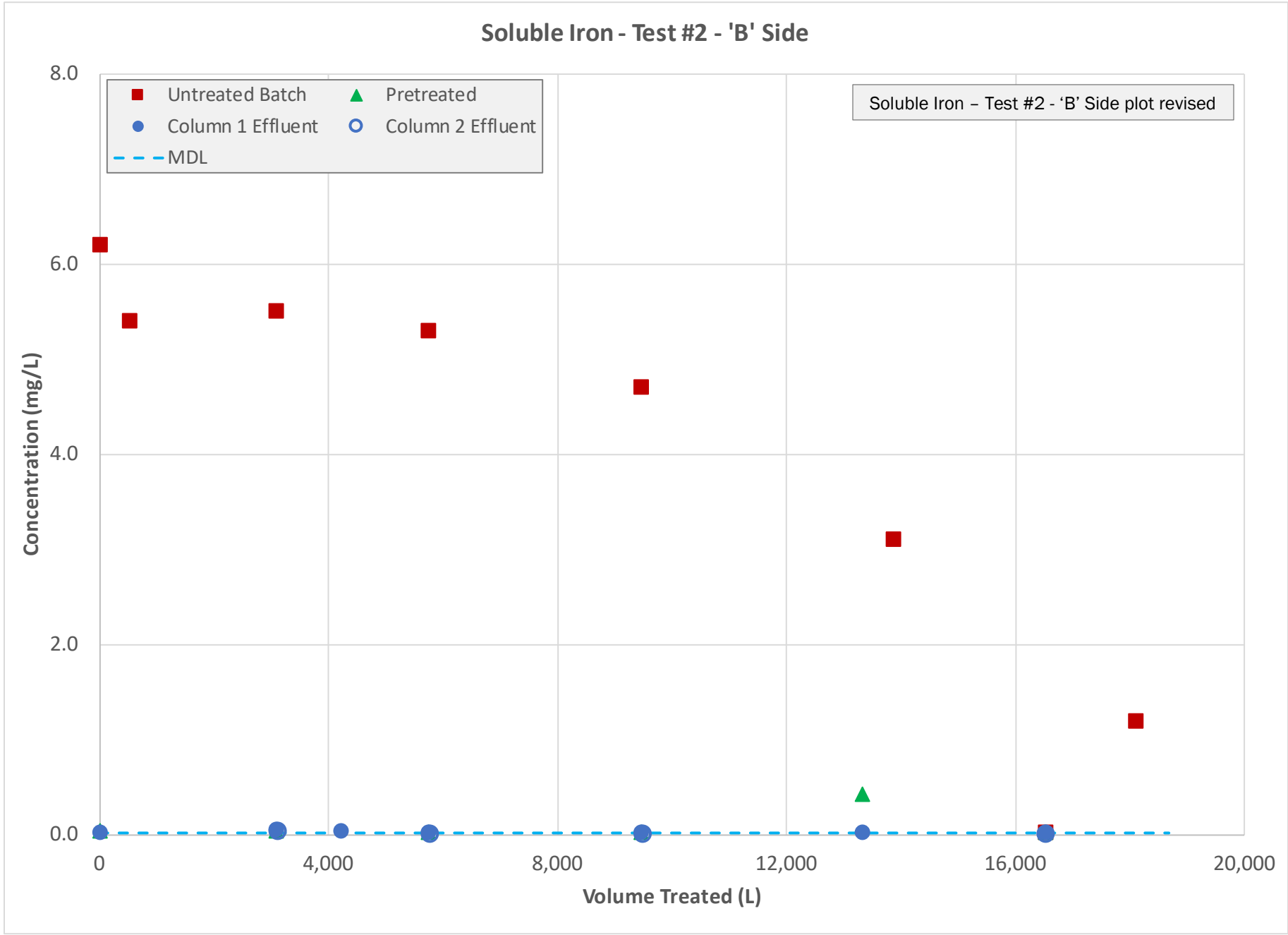

Total Organic Carbon (TOC) - Test #2 - 'A' Side
Concentration (mg/L)
2.0
1.6
1.2
0.8
0.4
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)
Untreated Batch
Pretreated
Column 1 Effluent
Column 2 Effluent
MDL
Previously Presented

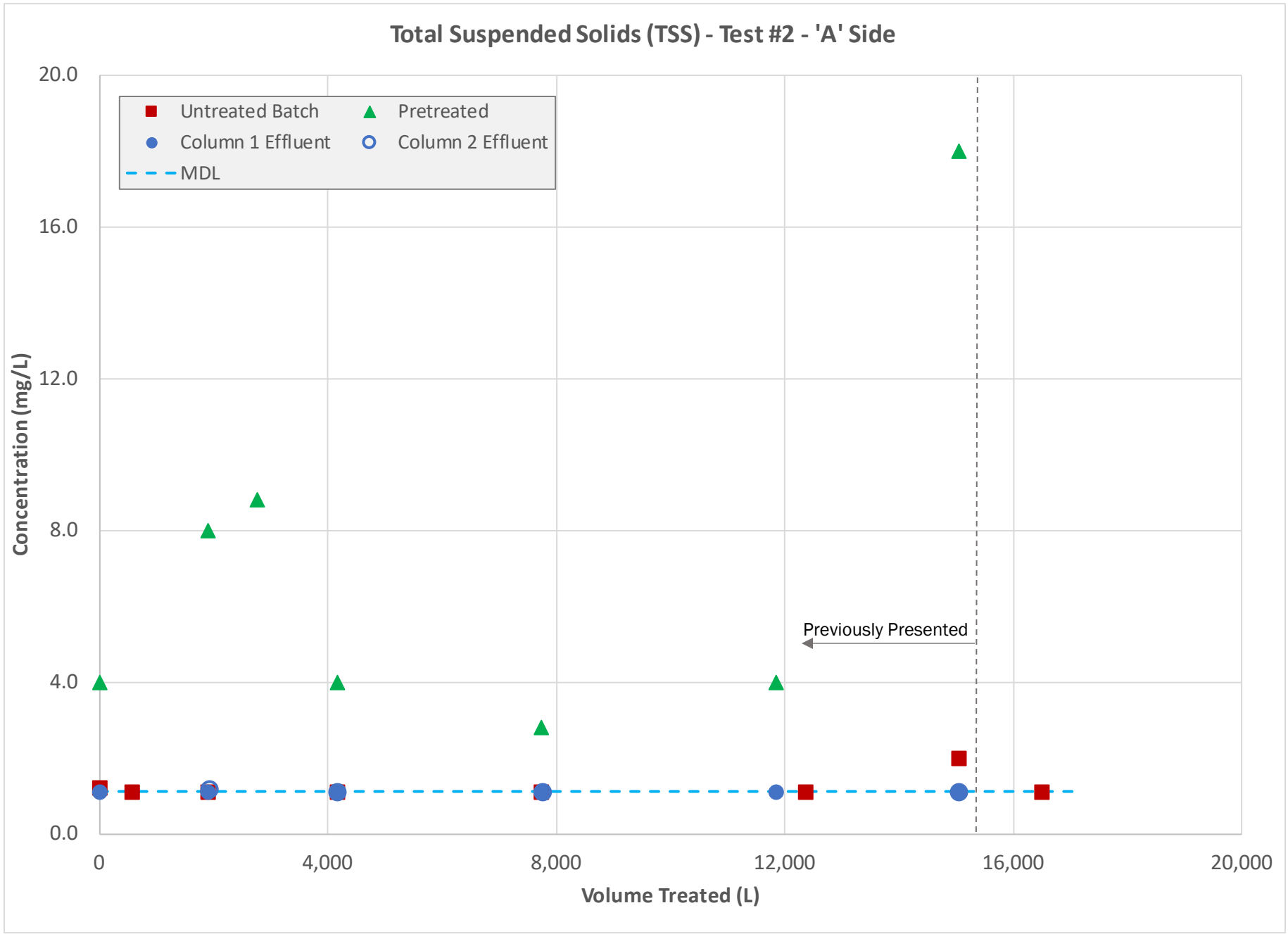

Total Organic Carbon (TOC) - Test #2 - 'B' Side
Concentration (mg/L)
2.0
1.6
1.2
0.8
0.4
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)
Untreated Batch
Pretreated
Column 1 Effluent
Column 2 Effluent
MDL
TOC – Test #2 - 'B' Side plot revised


Total Iron - Test #2 - 'A' Side
Untreated Batch
Pretreated
Column 1 Effluent
Column 2 Effluent
MDL
Concentration (mg/L)
8.0
6.0
4.0
2.0
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)
Previously Presented


Total Iron - Test #2 - 'B' Side
Untreated Batch
Pretreated
Column 1 Effluent
Column 2 Effluent
MDL
Total Iron – Test #2 - 'B' Side plot revised
8.0
6.0
4.0
2.0
0.0
Concentration (mg/L)
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)


Soluble Iron - Test #2 - 'A' Side
Untreated Batch
Pretreated
Column 1 Effluent
Column 2 Effluent
MDL
Previously Presented
Concentration (mg/L)
Volume Treated (L)
8.0
6.0
4.0
2.0
0.0
0
4,000
8,000
12,000
16,000
20,000


Soluble Iron - Test #2 - 'B' Side
Untreated Batch
Pretreated
Column 1 Effluent
Column 2 Effluent
MDL
Soluble Iron – Test #2 - 'B' Side plot revised
Concentration (mg/L)
8.0
6.0
4.0
2.0
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)


Total Suspended Solids (TSS) - Test #2 - 'A' Side
Untreated Batch
Pretreated
Column 1 Effluent
Column 2 Effluent
MDL
Previously Presented
Concentration (mg/L)
Volume Treated (L)
20.0
16.0
12.0
8.0
4.0
0.0
0
4,000
8,000
12,000
16,000
20,000


Total Suspended Solids (TSS) - Test #2 - 'B' Side
Total Suspended Solids – Test #2 - 'B' Side plot revised
Untreated Batch
Pretreated
Column 1 Effluent
Column 2 Effluent
MDL
Concentration (mg/L)
20.0
16.0
12.0
8.0
4.0
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)

APPENDIX B
COMPREHENSIVE PFAS TREATMENT RESULTS

Table 1. Untreated Batch (INF) Table 3+ Results – Test #2

Date	PFMOAA	R-EVE	Byproduct 5	Byproduct 4	PMPA	PFO2HxA	PEPA	NVHOS	PFECA_B	PFO3OA	HFPO-DA	PES	PFECA_G	PFO4DA	EVE Acid	Hydro EVE	Byproduct 6	Byproduct 2	PFO5DA	Byproduct 1
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0106	0.0107	0.0067	0.0073	0.0048	0.0048	0.0235	0.0114	0.0035	0.0092	0.0117	0.0012	0.0062	0.0082	0.0052	0.0020	0.0012	0.0073	0.0070	0.0094
08/06/19	23.9793	0.3591	1.3318	1.4030	4.1844	18.9882	0.7832	0.5864	ND	3.8361	4.9646	0.0024	ND	0.7411	0.1093	0.0091	0.0057	0.0852	0.1190	0.0244
08/08/19	22.0619	0.3594	1.3286	1.3829	4.1335	19.2401	0.7178	0.5618	ND	3.7469	4.8345	0.0024	ND	0.7352	0.1235	0.0105	0.0051	0.0998	0.1112	0.0281
08/14/19	31.4994	0.5673	1.7829	1.8848	3.8219	18.2107	0.7769	0.6857	ND	3.2418	4.5080	0.0014	ND	0.5711	0.1100	0.0090	0.0049	0.0792	0.0794	0.0211
08/19/19	24.3117	0.2550	1.5335	1.4737	3.1543	16.2538	0.6886	0.6481	ND	3.0627	4.0867	ND	ND	0.6555	0.1206	0.0093	0.0054	0.0845	0.0838	0.0182
08/20/19	17.8317	0.0420	1.3200	0.9968	2.9921	15.5132	0.5020	0.6137	ND	2.9120	3.9551	ND	ND	0.5117	0.0952	0.0072	0.0049	0.0683	0.0550	0.0172
08/26/19	31.7920	0.2160	1.0480	0.8000	3.4640	15.0820	0.9180	0.6100	ND	3.4660	5.2100	0.0100	ND	0.7880	0.1500	0.0080	0.0220	0.1460	0.1600	0.0140
9/04/19	38.7130	0.1340	0.6330	0.4300	2.8080	10.9120	1.0090	0.4990	0.0150	2.6510	4.0500	0.0020	ND	0.5150	0.0670	0.0960	0.0240	0.0800	0.0920	ND
AVERAGE[(1)]	27.2	0.28	1.28	1.20	3.51	16.3	0.77	0.60	< 0.0051	3.27	4.52	0.0029	< 0.0062	0.65	0.11	0.021	0.010	0.092	0.100	0.019

[(1)] Concentrations below reporting limit taken as equal to the reporting limit for calculating averages.

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 2. Pretreated Batch Table 3+ Results – Test #2

'A' TRAIN (PRE-A)

Date	PFMOAA	R-EVE	Byproduct 5	Byproduct 4	PMPA	PFO2HxA	PEPA	NVHOS	PFECA_B	PFO3OA	HFPO-DA	PES	PFECA_G	PFO4DA	EVE Acid	Hydro EVE	Byproduct 6	Byproduct 2	PFO5DA	Byproduct 1
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0106	0.0107	0.0067	0.0073	0.0048	0.0048	0.0235	0.0114	0.0035	0.0092	0.0117	0.0012	0.0062	0.0082	0.0052	0.0020	0.0012	0.0073	0.0070	0.0094
8/07/19	31.2152	0.3762	1.4163	1.4841	4.4976	19.1399	0.0671	0.2555	ND	3.9174	4.6800	0.0022	ND	0.8101	0.1246	0.0108	0.0054	0.1166	0.1529	0.0330
8/10/19	31.5423	0.3704	1.3908	1.4670	4.3923	19.0032	0.1283	0.2746	ND	3.6562	4.4886	0.0025	ND	0.7009	0.1243	0.0092	0.0052	0.1183	0.1273	0.0249
8/13/19	28.9500	0.1920	1.2246	0.7994	3.8180	17.9371	0.9801	0.7073	ND	3.5509	4.9872	0.0013	ND	0.6507	0.1197	0.0099	0.0064	0.1094	0.1350	0.0254
8/14/19	12.8493	0.0147	0.2206	0.1646	2.7950	17.1373	0.6963	0.6857	ND	3.3076	4.4864	0.0014	ND	0.6338	0.1176	0.0091	0.0055	0.1069	0.1162	0.0270
8/16/19	19.3977	ND	0.3179	0.1502	3.1276	15.0761	0.4979	0.6352	ND	3.1701	4.3206	ND	ND	0.6215	0.1118	0.0090	0.0056	0.1084	0.0942	0.0290
8/19/19	9.0655	ND	0.1681	0.1373	1.7708	14.9769	0.6455	0.6509	ND	3.1367	4.0831	ND	ND	0.6268	0.1175	0.0090	0.0058	0.1033	0.1142	0.0307
8/23/19	19.1480	ND	0.1460	0.0280	2.8880	14.2320	1.2440	0.7100	0.0140	3.5040	4.9680	0.0100	0.0080	0.6900	0.1340	0.0080	0.0220	0.1280	0.1460	0.0260
8/26/19	16.7820	ND	0.1820	0.0380	3.2720	14.6580	0.8040	0.6360	0.0140	3.5240	5.0020	0.0100	ND	0.7280	0.1280	0.0100	0.0220	0.1240	0.1280	0.0240
8/30/19	18.8620	0.0470	0.3770	0.0530	3.3420	15.2310	1.5060	0.7940	0.0090	3.5790	5.3850	0.0060	ND	0.7220	ND	0.1290	0.0230	0.1100	0.1280	0.0100
9/03/19	27.9560	ND	0.1870	0.0270	3.8630	14.5860	1.3540	0.7270	0.0150	3.5590	4.9400	0.0070	0.0070	0.6890	0.0120	0.1230	0.0230	0.1120	0.1320	0.0090
AVERAGE[1]	21.6	0.11	0.56	0.43	3.38	16.2	0.79	0.61	0.0073	3.49	4.73	0.0043	< 0.0064	0.69	0.10	0.033	0.012	0.11	0.13	0.024

'B' TRAIN (PRE B)

Date	PFMOAA	R-EVE	Byproduct 5	Byproduct 4	PMPA	PFO2HxA	PEPA	NVHOS	PFECA_B	PFO3OA	HFPO-DA	PES	PFECA_G	PFO4DA	EVE Acid	Hydro EVE	Byproduct 6	Byproduct 2	PFO5DA	Byproduct 1
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0106	0.0107	0.0067	0.0073	0.0048	0.0048	0.0235	0.0114	0.0035	0.0092	0.0117	0.0012	0.0062	0.0082	0.0052	0.0020	0.0012	0.0073	0.0070	0.0094
8/07/19	32.4717	0.3310	1.4262	1.5456	4.5041	19.1952	0.1502	0.2411	ND	3.9023	4.6859	0.0022	ND	0.7568	0.1300	0.0109	0.0054	0.1156	0.1521	0.0282
8/10/19	31.8240	0.3693	1.4335	1.4623	4.4465	19.2375	0.2073	0.3312	ND	3.6943	4.6064	0.0020	ND	0.7335	0.1244	0.0100	0.0055	0.1149	0.1372	0.0302
8/13/19	26.5006	0.0220	0.7925	0.2535	3.6938	17.9126	0.8993	0.6987	ND	3.4926	4.9019	ND	ND	0.6309	0.1185	0.0080	0.0056	0.1094	0.1160	0.0301
8/14/19	16.3302	0.0118	0.1989	0.1615	2.5993	16.5955	0.6546	0.6612	ND	3.2898	4.4220	0.0012	ND	0.6210	0.1183	0.0073	0.0053	0.1081	0.0979	0.0264
8/16/19	20.1779	0.0151	0.4190	0.1283	2.9920	14.8633	0.4897	0.6441	ND	3.1700	4.3125	ND	ND	0.6151	0.1114	0.0089	0.0053	0.1050	0.1042	0.0319
8/19/19	13.5195	ND	0.1794	0.1685	1.5051	14.2993	0.6130	0.6418	ND	3.0968	4.0172	ND	ND	0.5999	0.1165	0.0094	0.0055	0.1013	0.1011	0.0278
8/23/19	19.0300	ND	0.1700	0.0340	3.1080	14.0880	1.1760	0.6620	0.0140	3.5040	5.0360	0.0080	ND	0.7020	0.1300	0.0060	0.0220	0.1280	0.1420	0.0300
8/26/19	16.2200	ND	0.1620	0.0320	3.1740	14.3540	0.8160	0.4400	0.0140	3.4320	4.8960	0.0080	0.0080	0.7060	0.1240	0.0060	0.0220	0.1220	0.1320	0.0180
8/30/19	25.5110	ND	0.1300	0.0370	3.6400	14.1260	1.0620	0.6440	0.0100	3.6130	5.3070	0.0060	ND	0.6870	0.4900	0.1210	0.0200	0.1100	0.1080	0.0130
9/03/19	28.0080	ND	0.2390	0.0240	3.7340	14.2100	1.3650	0.6790	0.0150	3.4870	4.8090	0.0060	0.0070	0.7140	0.0140	0.1250	0.0230	0.1070	0.1280	0.0180
9/13/19	27.2790	0.0780	0.1570	0.0330	3.5440	14.0890	0.8680	0.6680	0.0090	3.1760	4.7760	0.0060	ND	0.4700	0.6260	0.0850	0.0210	0.0620	0.0430	ND
AVERAGE[1]	23.4	0.080	0.48	0.35	3.36	15.7	0.75	0.57	0.0075	3.44	4.71	0.0039	< 0.0064	0.66	0.19	0.036	0.013	0.11	0.11	0.024

[1] Concentrations below reporting limit taken as equal to the reporting limit for calculating averages.

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 3. Column 1 Effluent Table 3+ Results – Test #2[1]
'A' TRAIN (GAC 1A)

Date	PFMOAA	R-EVE	Byproduct 5	Byproduct 4	PMPA	PFO2HxA	PEPA	NVHOS	PFECA_B	PFO3OA	HFPO-DA	PES	PFECA_G	PFO4DA	EVE Acid	Hydro EVE	Byproduct 6	Byproduct 2	PFO5DA	Byproduct 1
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0106	0.0107	0.0067	0.0073	0.0048	0.0048	0.0235	0.0114	0.0035	0.0092	0.0117	0.0012	0.0062	0.0082	0.0052	0.0020	0.0012	0.0073	0.0070	0.0094
08/07/19	0.2931	0.0138	ND	0.0113	0.0138	0.0209	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0014	ND	ND	ND
08/08/19	0.2708	0.0119	ND	0.0142	0.0213	0.0264	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0013	ND	ND	ND
08/09/19	0.1972	ND	ND	0.0109	0.0322	0.0183	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0014	ND	ND	ND
08/10/19	0.3070	0.0217	ND	ND	0.0380	0.0293	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0013	ND	ND	ND
08/13/19	0.0315	ND	ND	ND	ND	0.0055	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND
08/14/19	0.0345	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND
08/15/19	0.0259	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND
08/16/19	0.0121	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0019	ND	ND	ND
08/17/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0015	ND	ND	ND
08/18/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0015	ND	ND	ND
08/19/19	0.0122	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0015	ND	ND	ND
08/20/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0442	ND	0.0145	0.0015	ND	ND	ND
08/21/19	ND	ND	ND	ND	0.0064	ND	ND	ND	ND	ND	ND	ND	ND	0.0349	ND	0.0344	0.0016	ND	ND	ND
08/22/19	0.0260	ND	0.0120	ND	0.0420	0.0200	0.0240	0.0360	0.0140	ND	ND	0.0080	ND	ND	0.0120	ND	0.0200	0.0180	ND	ND
08/23/19	0.0360	ND	0.0120	ND	0.0520	0.0200	0.0280	0.0340	0.0140	ND	ND	0.0080	ND	0.0260	0.0120	ND	0.0180	0.0180	ND	ND
08/24/19	0.0420	ND	ND	ND	0.0780	0.0200	ND	0.0340	0.0140	ND	ND	0.0080	ND	ND	0.0140	ND	0.0180	0.0180	ND	ND
08/25/19	0.0920	ND	0.0120	ND	0.1240	0.0260	ND	0.0340	0.0140	ND	0.0140	0.0080	ND	ND	0.0120	ND	0.0180	0.0160	ND	ND
08/26/19	0.2100	ND	0.0120	ND	0.1920	0.0320	ND	0.0340	0.0140	ND	0.0140	0.0080	ND	ND	0.0120	ND	0.0180	0.0180	ND	ND
08/27/19	0.3320	ND	0.0120	ND	0.2480	0.0380	ND	0.0340	0.0140	ND	0.0140	0.0080	ND	ND	0.0120	ND	0.0100	0.0220	ND	ND
08/28/19	1.044	ND	ND	ND	0.380	0.076	0.028	0.016	0.010	ND	0.020	0.006	ND	0.252	0.341	0.032	0.021	0.013	ND	ND
08/29/19	0.844	ND	ND	0.022	0.418	0.039	0.031	0.016	0.010	ND	0.020	0.006	ND	0.213	0.526	0.207	0.019	0.013	ND	ND
08/30/19	1.028	ND	ND	ND	0.492	0.027	0.027	0.017	0.010	ND	ND	0.006	ND	0.257	ND	0.007	0.017	ND	ND	ND
09/01/19	3.509	ND	ND	ND	0.756	0.088	0.053	0.017	0.010	ND	0.059	0.006	ND	ND	ND	0.008	0.017	0.013	ND	ND
09/03/19	4.834	ND	ND	ND	0.965	0.096	0.083	0.017	0.010	ND	0.077	0.006	ND	ND	ND	0.008	0.017	0.014	ND	ND
09/04/19	5.180	ND	0.007	ND	1.265	0.125	0.059	0.017	0.015	ND	ND	0.001	ND	ND	0.142	0.027	0.023	0.020	ND	ND
09/14/19	24.274	0.025	0.029	ND	2.818	1.547	0.468	0.077	0.008	0.143	0.808	0.005	ND	0.008	ND	0.015	0.019	0.019	ND	ND

[1] Samples collected between 9/05/19 and 9/14/19 not analyzed.

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 3. Column 1 Effluent Table 3+ Results – Test #2 [1] (Continued)
'B' TRAIN (GAC 1B)

Date	PFMOAA	R-EVE	Byproduct 5	Byproduct 4	PMPA	PFO2HxA	PEPA	NVHOS	PFECA_B	PFO3OA	HFPO-DA	PES	PFECA_G	PFO4DA	EVE Acid	Hydro EVE	Byproduct 6	Byproduct 2	PFO5DA	Byproduct 1
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0106	0.0107	0.0067	0.0073	0.0048	0.0048	0.0235	0.0114	0.0035	0.0092	0.0117	0.0012	0.0062	0.0082	0.0052	0.0020	0.0012	0.0073	0.0070	0.0094
08/07/19	0.0196	0.0156	ND	0.0074	0.0063	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0014	ND	ND	ND
08/08/19	10.1857	0.0173	ND	ND	1.5129	ND	ND	ND	ND	ND	ND	0.0017	ND	ND	ND	ND	0.0013	ND	ND	ND
08/09/19	19.6996	0.0115	ND	0.0125	2.6887	0.0403	ND	ND	ND	ND	ND	0.0017	ND	ND	ND	ND	0.0013	ND	ND	ND
08/10/19	22.7940	ND	ND	0.0101	3.1160	0.1570	0.0352	ND	ND	ND	0.0284	0.0016	ND	ND	ND	ND	0.0013	ND	ND	ND
08/12/19	21.7829	ND	ND	0.0101	2.6986	0.0897	0.0247	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0014	ND	ND	ND
08/13/19	12.3254	ND	0.0115	ND	2.5195	0.3161	0.2442	ND	ND	ND	0.1145	ND	ND	ND	ND	ND	0.0015	ND	ND	ND
08/14/19	18.9961	ND	0.0204	0.0075	2.0985	1.3176	0.2941	0.0174	ND	0.0130	0.4616	ND	ND	ND	ND	ND	0.0017	ND	ND	ND
08/15/19	16.4219	ND	0.0468	0.0119	2.7188	2.2289	0.2620	0.0347	ND	0.0369	0.8147	ND	ND	ND	ND	ND	0.0016	ND	ND	ND
08/16/19	16.0112	ND	0.0689	0.0266	2.6951	3.0187	0.2887	0.0410	ND	0.0605	1.0580	ND	ND	ND	ND	ND	0.0016	ND	ND	ND
08/17/19	7.6815	ND	0.0283	0.0181	1.8985	3.4971	0.4785	0.0685	ND	0.0764	1.1082	ND	ND	ND	0.0053	ND	0.0017	ND	ND	ND
08/18/19	6.5818	ND	0.0224	0.0207	1.6201	3.1040	0.4247	0.0612	ND	0.0641	1.1533	ND	ND	ND	ND	ND	0.0017	ND	ND	ND
08/19/19	14.3884	ND	0.0294	0.0132	1.4927	3.4569	0.4021	0.0846	ND	0.0902	1.1640	ND	ND	ND	ND	ND	0.0018	ND	ND	ND
08/20/19	11.2785	ND	0.0217	0.0222	2.5561	3.6777	0.3073	0.0797	ND	0.1053	1.2159	ND	ND	ND	0.0052	0.0356	0.0017	ND	ND	ND
08/21/19	11.1181	ND	0.0710	0.0284	2.5885	4.8345	0.3284	0.0926	ND	0.1908	1.5692	ND	ND	ND	0.0095	0.0497	0.0016	ND	ND	ND
08/22/19	17.8480	ND	0.0280	ND	2.5540	5.1140	1.0700	0.1720	0.0140	0.1980	1.9660	0.0080	ND	ND	0.0200	ND	0.0200	0.0200	ND	ND
08/23/19	15.6840	ND	0.0300	ND	3.0120	5.3640	0.7440	0.1340	0.0140	0.2560	1.9920	0.0080	ND	ND	0.0220	ND	0.0180	0.0200	ND	ND
08/24/19	14.8120	ND	0.0600	ND	2.9040	6.5200	0.5720	0.2000	0.0140	0.4680	2.5640	0.0080	ND	0.0280	0.0280	ND	0.0180	0.0220	ND	ND
08/25/19	14.5360	ND	0.0660	ND	2.9440	7.0480	0.6880	0.2180	0.0140	0.6320	2.7840	0.0080	ND	0.0460	0.0340	ND	0.0180	0.0280	ND	ND
08/26/19	14.5220	ND	0.0580	0.0080	2.9340	7.8900	0.6280	0.1740	0.0140	0.8080	2.9420	0.0080	ND	0.0720	0.0440	ND	0.0200	0.0300	ND	ND
08/27/19	14.4920	ND	0.0600	ND	3.0400	8.4960	0.5920	0.2200	0.0140	0.9760	2.9920	0.0080	ND	0.1020	0.0460	ND	0.0200	0.0340	ND	ND
08/28/19	25.803	0.020	0.040	0.050	3.313	8.761	1.156	0.343	0.010	0.874	3.552	0.006	ND	0.067	ND	0.031	0.017	0.017	ND	ND
08/29/19	17.290	ND	0.040	0.036	3.042	9.960	1.278	0.408	0.008	1.071	3.742	0.006	ND	0.085	ND	0.046	0.020	0.028	ND	ND
08/30/19	24.470	ND	0.051	0.013	3.755	9.813	0.894	0.327	0.010	1.110	3.763	0.006	ND	0.076	0.519	0.041	0.017	0.029	ND	ND
09/01/19	31.059	0.030	0.063	0.022	3.070	10.897	1.391	0.492	0.010	1.554	4.115	0.006	ND	0.177	ND	0.056	0.018	0.039	ND	ND
09/03/19	22.579	ND	0.070	ND	2.696	8.377	0.922	0.300	0.015	1.244	3.031	0.001	ND	0.137	0.139	0.046	0.023	0.039	ND	ND
09/04/19	22.925	ND	0.118	ND	2.734	9.246	0.977	0.337	0.015	1.481	3.313	0.002	ND	0.183	0.139	0.054	0.024	0.043	0.016	ND
09/13/19	28.792	0.090	0.143	0.025	3.592	13.994	0.924	0.587	0.009	2.352	4.622	0.006	ND	0.295	0.610	0.068	0.020	0.048	0.011	ND
09/14/19	30.584	ND	0.149	0.042	3.297	13.975	1.024	0.626	0.008	2.357	4.416	0.006	ND	0.287	ND	0.068	0.020	0.045	0.015	ND

[1] Samples collected between 9/05/19 and 9/14/19 not analyzed.

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 4. Column 2 Effluent Table 3+ Results – Test #2[1]

'A' TRAIN (GAC 2A)

Date	PFMOAA	R-EVE	Byproduct 5	Byproduct 4	PMPA	PFO2HxA	PEPA	NVHOS	PFECA_B	PFO3OA	HFPO-DA	PES	PFECA_G	PFO4DA	EVE Acid	Hydro EVE	Byproduct 6	Byproduct 2	PFO5DA	Byproduct 1
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0106	0.0107	0.0067	0.0073	0.0048	0.0048	0.0235	0.0114	0.0035	0.0092	0.0117	0.0012	0.0062	0.0082	0.0052	0.0020	0.0012	0.0073	0.0070	0.0094
08/07/19	0.0366	0.0108	ND	ND	0.0241	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0014	ND	ND	ND
08/09/19	0.0519	0.0138	ND	0.0198	0.0107	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0014	ND	ND	ND
08/13/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0017	ND	ND	ND
08/14/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0017	ND	ND	ND
08/16/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND
08/19/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016	0.0088	ND	ND
08/21/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0249	0.0069	0.0436	0.0015	ND	ND	ND
08/23/19	ND	ND	0.0120	ND	0.0180	0.0200	ND	0.0360	0.0140	ND	ND	ND	ND	ND	0.0120	ND	0.0180	0.0160	ND	ND
08/26/19	ND	ND	0.0120	ND	0.0180	0.0200	0.0240	0.0360	0.0140	ND	ND	ND	ND	ND	0.0120	ND	0.0180	0.0180	ND	ND
08/28/19	0.045	ND	ND	ND	0.074	0.014	0.027	0.016	0.010	ND	ND	0.006	ND	ND	ND	0.009	0.017	0.013	ND	ND
08/30/19	ND	0.024	0.013	0.022	0.016	0.014	ND	0.028	0.008	ND	ND	0.005	ND	ND	ND	0.009	0.019	0.016	ND	ND
09/03/19	0.011	ND	0.008	ND	0.022	0.013	0.035	0.023	0.015	ND	0.165	0.006	0.006	ND	0.1880	0.050	0.020	0.018	ND	ND
09/04/19	ND	ND	0.007	ND	0.024	0.013	0.030	0.023	0.015	ND	0.147	0.006	0.006	0.027	0.1710	0.049	0.020	0.017	ND	ND

'B' TRAIN (GAC 2B)

Date	PFMOAA	R-EVE	Byproduct 5	Byproduct 4	PMPA	PFO2HxA	PEPA	NVHOS	PFECA_B	PFO3OA	HFPO-DA	PES	PFECA_G	PFO4DA	EVE Acid	Hydro EVE	Byproduct 6	Byproduct 2	PFO5DA	Byproduct 1
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0106	0.0107	0.0067	0.0073	0.0048	0.0048	0.0235	0.0114	0.0035	0.0092	0.0117	0.0012	0.0062	0.0082	0.0052	0.0020	0.0012	0.0073	0.0070	0.0094
08/07/19	0.0047	0.0107	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0017	ND	ND	ND	ND	0.0014	ND	ND	ND
08/09/19	3.1165	0.0168	ND	ND	0.6707	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0013	ND	ND	ND
08/12/19	8.0491	ND	ND	ND	1.1702	ND	ND	ND	ND	ND	ND	0.0017	ND	ND	ND	ND	0.0014	ND	ND	ND
08/13/19	4.1777	ND	ND	ND	1.1520	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0015	ND	ND	ND
08/14/19	11.0963	ND	ND	ND	1.2337	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0018	ND	ND	ND
08/16/19	11.1875	ND	ND	ND	1.8532	ND	0.0416	ND	ND	ND	ND	ND	ND	ND	0.0061	ND	0.0016	ND	ND	ND
08/19/19	11.0842	ND	ND	ND	1.4422	0.0261	0.0968	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND
08/21/19	8.1834	ND	ND	ND	2.0066	0.0422	0.0891	ND	ND	ND	ND	ND	ND	0.0306	0.0075	0.0453	0.0016	ND	ND	ND
08/23/19	11.2020	ND	0.0120	ND	2.3800	0.0800	0.2280	0.0340	0.0140	ND	0.0340	0.0080	ND	ND	0.0120	ND	0.0180	0.0160	ND	ND
08/26/19	10.4640	ND	0.0120	ND	2.3500	0.1980	0.2700	0.0340	0.0140	ND	0.1580	0.0080	ND	0.0100	0.0120	ND	0.0180	0.0200	ND	ND
08/28/19	18.898	ND	ND	0.025	2.379	0.234	0.525	0.017	0.010	ND	0.196	0.006	ND	ND	ND	0.007	0.017	0.013	ND	ND
08/30/19	17.800	ND	ND	ND	3.019	0.309	0.459	0.016	0.010	ND	0.231	0.006	ND	0.245	0.568	0.204	0.017	0.013	ND	ND
09/03/19	18.886	ND	ND	ND	2.271	0.542	0.492	0.017	0.015	ND	0.054	0.001	ND	ND	0.133	0.042	0.023	0.019	ND	ND
09/04/19	19.841	ND	ND	ND	2.658	0.826	0.604	0.019	0.015	ND	0.253	0.001	ND	0.012	0.141	0.040	0.022	0.019	ND	ND
09/13/19	29.948	ND	0.031	0.066	3.535	4.599	0.831	0.074	0.008	0.100	1.939	0.005	ND	0.289	ND	0.014	0.021	0.015	ND	ND

[1] Samples collected between 9/05/19 and 9/14/19 discarded without being analyzed.

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 5. Column 3 Effluent Table 3+ Results – Test #2[1]

'A' TRAIN (GAC 3A)

Date	PFMOAA	R-EVE	Byproduct 5	Byproduct 4	PMPA	PFO2HxA	PEPA	NVHOS	PFECA_B	PFO3OA	HFPO-DA	PES	PFECA_G	PFO4DA	EVE Acid	Hydro EVE	Byproduct 6	Byproduct 2	PFO5DA	Byproduct 1
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0106	0.0107	0.0067	0.0073	0.0048	0.0048	0.0235	0.0114	0.0035	0.0092	0.0117	0.0012	0.0062	0.0082	0.0052	0.0020	0.0012	0.0073	0.0070	0.0094
08/07/19	ND	ND	ND	0.0103	0.0231	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0013	ND	ND	ND
08/09/19	ND	ND	ND	0.0075	0.0058	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0013	ND	ND	ND
08/14/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0015	ND	ND	ND
08/19/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0316	ND	ND	0.0018	ND	ND	ND
08/23/19	ND	ND	0.0120	ND	0.0200	0.0200	ND	0.0340	0.0140	ND	ND	0.0080	ND	ND	0.0120	ND	0.0180	0.0160	ND	ND
08/26/19	ND	ND	0.0120	ND	0.0180	0.0200	0.0240	0.0340	0.0140	ND	ND	0.0080	ND	ND	0.0120	ND	0.0180	0.0200	ND	ND
08/30/19	ND	ND	ND	ND	0.036	0.013	0.027	0.016	0.010	ND	ND	0.006	ND	0.239	ND	0.007	0.017	0.013	ND	ND
09/03/19	ND	ND	0.0080	ND	0.016	0.013	0.032	0.023	0.015	ND	0.061	0.006	0.006	0.008	0.175	0.050	0.020	0.018	ND	ND

'B' TRAIN (GAC 3B)

Date	PFMOAA	R-EVE	Byproduct 5	Byproduct 4	PMPA	PFO2HxA	PEPA	NVHOS	PFECA_B	PFO3OA	HFPO-DA	PES	PFECA_G	PFO4DA	EVE Acid	Hydro EVE	Byproduct 6	Byproduct 2	PFO5DA	Byproduct 1
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0106	0.0107	0.0067	0.0073	0.0048	0.0048	0.0235	0.0114	0.0035	0.0092	0.0117	0.0012	0.0062	0.0082	0.0052	0.0020	0.0012	0.0073	0.0070	0.0094
08/07/19	0.0126	0.0170	ND	0.0101	ND	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0014	ND	ND	ND
08/09/19	0.1274	0.0153	ND	0.0184	0.1105	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0013	ND	ND	ND
08/14/19	4.1784	ND	ND	ND	0.5786	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0018	ND	ND	ND
08/19/19	6.5831	ND	ND	ND	1.2108	ND	ND	ND	ND	ND	ND	ND	ND	0.0458	ND	ND	0.0017	ND	ND	ND
08/23/19	6.9180	ND	0.0120	ND	1.7420	0.0200	0.0360	0.0340	0.0140	ND	ND	0.0080	ND	ND	0.0160	ND	0.0180	0.0160	ND	ND
08/26/19	6.7880	ND	0.0120	ND	1.7280	0.0200	0.0520	0.0340	0.0140	ND	ND	0.0080	ND	ND	0.0140	ND	0.0180	0.0240	ND	ND
08/30/19	12.086	ND	ND	ND	2.129	0.013	0.113	0.017	0.010	ND	ND	0.0060	ND	0.270	0.418	0.010	0.017	0.014	ND	ND
09/03/19	13.813	ND	0.008	ND	2.431	0.013	0.179	0.023	0.015	ND	0.159	0.0060	0.006	0.013	0.149	0.052	0.020	0.017	ND	ND
09/13/19	23.815	0.031	0.013	0.030	3.312	0.041	0.263	0.028	0.008	ND	0.046	0.0050	ND	0.247	0.698	0.009	0.019	0.017	ND	ND

(1) Samples collected between 9/05/19 and 9/14/19 discarded without being analyzed.

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 6. Column 4 Effluent Table 3+ Results – Test #2[1]

'A' TRAIN (GAC 4A)

Date	PFMOAA	R-EVE	Byproduct 5	Byproduct 4	PMPA	PFO2HxA	PEPA	NVHOS	PFECA_B	PFO3OA	HFPO-DA	PES	PFECA_G	PFO4DA	EVE Acid	Hydro EVE	Byproduct 6	Byproduct 2	PFO5DA	Byproduct 1
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0106	0.0107	0.0067	0.0073	0.0048	0.0048	0.0235	0.0114	0.0035	0.0092	0.0117	0.0012	0.0062	0.0082	0.0052	0.0020	0.0012	0.0073	0.0070	0.0094
08/07/19	ND	ND	ND	ND	0.0071	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0013	ND	ND	ND
08/09/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0013	ND	ND	ND
08/14/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0017	ND	ND	ND
08/19/19	ND	ND	ND	0.0078	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0434	ND	ND	0.0014	ND	ND	ND
08/23/19	ND	ND	0.0120	ND	0.0220	0.0200	ND	0.0340	0.0140	ND	ND	0.0080	ND	ND	0.0120	ND	0.0180	0.0180	ND	ND
08/26/19	ND	ND	0.0120	ND	0.0180	0.0200	0.0240	0.0340	0.0140	ND	ND	0.0080	ND	ND	0.0140	ND	0.0180	0.0220	ND	ND
08/30/19	0.029	ND	ND	ND	0.030	0.013	0.027	0.016	0.010	ND	ND	0.006	ND	0.250	0.571	0.115	0.017	0.013	ND	ND
09/03/19	0.015	ND	0.008	ND	0.013	0.013	0.036	0.023	0.015	ND	0.186	0.006	0.007	0.017	0.170	0.051	0.020	0.018	ND	ND
09/13/19	0.023	0.024	0.013	0.045	0.018	0.013	ND	0.026	0.008	ND	ND	0.006	ND	0.284	ND	0.015	0.019	0.015	ND	ND

'B' TRAIN (GAC 4B)

Date	PFMOAA	R-EVE	Byproduct 5	Byproduct 4	PMPA	PFO2HxA	PEPA	NVHOS	PFECA_B	PFO3OA	HFPO-DA	PES	PFECA_G	PFO4DA	EVE Acid	Hydro EVE	Byproduct 6	Byproduct 2	PFO5DA	Byproduct 1
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0106	0.0107	0.0067	0.0073	0.0048	0.0048	0.0235	0.0114	0.0035	0.0092	0.0117	0.0012	0.0062	0.0082	0.0052	0.0020	0.0012	0.0073	0.0070	0.0094
08/07/19	ND	0.0108	ND	ND	0.0054	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0013	ND	ND	ND
08/09/19	ND	ND	ND	ND	0.0228	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.0013	ND	ND	ND
08/14/19	0.9456	ND	ND	ND	0.2181	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0017	ND	ND	ND
08/19/19	3.7703	ND	ND	ND	0.7442	ND	ND	ND	ND	ND	ND	ND	ND	0.0116	ND	ND	0.0016	ND	ND	ND
08/23/19	3.9560	ND	0.0120	ND	1.1680	0.0200	ND	0.0340	0.0140	ND	ND	0.0080	ND	ND	0.0160	ND	0.0180	0.0160	ND	ND
08/26/19	4.3480	ND	0.0120	ND	1.2780	0.0200	ND	0.0340	0.0140	ND	ND	0.0080	ND	ND	0.0120	ND	0.0180	0.0180	ND	ND
08/30/19	12.086	ND	ND	ND	2.129	0.013	0.113	0.017	0.010	ND	ND	0.0060	ND	0.270	0.418	0.010	0.017	0.014	ND	ND
09/03/19	13.813	ND	0.008	ND	2.431	0.013	0.179	0.023	0.015	ND	0.159	0.0060	0.006	0.013	0.149	0.052	0.020	0.017	ND	ND
09/13/19	23.815	0.031	0.013	0.030	3.312	0.041	0.263	0.028	0.008	ND	0.046	0.0050	ND	0.247	0.698	0.009	0.019	0.017	ND	ND

[1] Samples collected between 9/05/19 and 9/14/19 discarded without being analyzed.

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 7. Untreated Batch (INF) Mod 537 MAX Results – Test #2

Date	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	ADONA	F-35 Major	F-35 Minor	NaDONA	NEtFOSA	NEtFOSE	NEtFOSAA	NMeFOSA	NMeFOSE	NMeFOSAA	PFBS	PFBA	PFDS	PFDA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.020	0.020	0.020	0.0021	0.0020	0.0020	0.0021	0.0020	0.0020	0.020	0.0020	0.0040	0.020	0.0020	0.0020	0.0020	0.0020
8/06/19	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	0.12	ND	ND
8/08/19	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	0.12	ND	ND
8/14/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND
8/19/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
8/26/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
9/04/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
9/09/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND
9/12/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
9/13/19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND

Date	PFDoS	PFDoA	PFHpS	PFHpA	PFHxS	PFHxA	PFHxDA	PFODA	PFNS	PFNA	FOSA	PFOS	PFOA	PFPeS	PFPeA	PFTeA	PFTriA	PFUnA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
8/06/19	ND	ND	ND	0.016	ND	0.019	ND	ND	ND	ND	ND	ND	0.012	ND	0.17	ND	ND	ND
8/08/19	ND	ND	ND	0.015	ND	0.020	ND	ND	ND	ND	ND	ND	0.011	ND	0.16	ND	ND	ND
8/14/19	ND	ND	ND	0.018	ND	0.022	ND	ND	ND	0.002	ND	ND	0.011	ND	0.17	ND	ND	ND
8/19/19	ND	ND	ND	0.018	ND	0.021	ND	ND	ND	0.0021	ND	ND	0.013	ND	0.16	ND	ND	ND
8/26/19	ND	ND	ND	0.018	ND	0.021	ND	ND	ND	ND	ND	ND	0.0096	ND	0.16	ND	ND	ND
9/04/19	ND	ND	ND	0.018	ND	0.019	ND	ND	ND	ND	ND	ND	0.011	ND	0.16	ND	ND	ND
9/09/19	ND	ND	ND	0.015	ND	0.020	ND	ND	ND	ND	ND	ND	0.0067	ND	0.17	ND	ND	ND
9/12/19	ND	ND	ND	0.014	ND	0.019	ND	ND	ND	ND	ND	ND	0.0072	ND	0.16	ND	ND	ND
9/13/19	ND	ND	ND	0.013	ND	0.019	ND	ND	ND	ND	ND	ND	0.0057	ND	0.16	ND	ND	ND

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 8. Pretreated Batch Mod 537 MAX Results – Test #2
'A' TRAIN (PRE-A)

Date	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	ADONA	F-35 Major	F-35 Minor	NaDONA	NEtFOSA	NEtFOSE	NEtFOSAA	NMeFOSA	NMeFOSE	NMeFOSAA	PFBS	PFBA	PFDS	PFDA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.020	0.020	0.020	0.0021	0.0020	0.0020	0.0021	0.0020	0.0020	0.020	0.0020	0.0040	0.020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	0.12	ND	ND
8/10/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND
8/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND
8/16/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND
8/26/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
9/03/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
9/06/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND
9/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND

Date	PFDoS	PFDoA	PFHpS	PFHpA	PFHxS	PFHxA	PFHxDA	PFODA	PFNS	PFNA	FOSA	PFOS	PFOA	PFPeS	PFPeA	PFTeA	PFTriA	PFUnA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	0.016	ND	0.02	ND	ND	ND	ND	ND	ND	0.012	ND	0.16	ND	ND	ND
8/10/2019	ND	ND	ND	0.017	ND	0.022	ND	ND	ND	ND	ND	ND	0.011	ND	0.16	ND	ND	ND
8/13/2019	ND	ND	ND	0.017	ND	0.021	ND	ND	ND	ND	ND	ND	0.012	ND	0.16	ND	ND	ND
8/14/2019	ND	ND	ND	0.018	ND	0.021	ND	ND	ND	ND	ND	ND	0.012	ND	0.16	ND	ND	ND
8/16/2019	ND	ND	ND	0.019	ND	0.021	ND	ND	ND	ND	ND	ND	0.01	ND	0.17	ND	ND	ND
8/19/2019	ND	ND	ND	0.017	ND	0.021	ND	ND	ND	ND	ND	ND	0.012	ND	0.16	ND	ND	ND
8/23/2019	ND	ND	ND	0.017	ND	0.02	ND	ND	ND	ND	ND	ND	0.012	ND	0.15	ND	ND	ND
8/26/2019	ND	ND	ND	0.017	ND	0.02	ND	ND	ND	ND	ND	ND	0.011	ND	0.17	ND	ND	ND
8/30/2019	ND	ND	ND	0.015	ND	0.022	ND	ND	ND	ND	ND	ND	0.0095	ND	0.18	ND	ND	ND
9/03/2019	ND	ND	ND	0.016	ND	0.021	ND	ND	ND	ND	ND	ND	0.0086	ND	0.17	ND	ND	ND
9/06/2019	ND	ND	ND	0.013	ND	0.019	ND	ND	ND	ND	ND	ND	0.0071	ND	0.16	ND	ND	ND
9/09/2019	ND	ND	ND	0.013	ND	0.019	ND	ND	ND	ND	ND	ND	0.0077	ND	0.16	ND	ND	ND
9/13/2019	ND	ND	ND	0.012	ND	0.018	ND	ND	ND	ND	ND	ND	0.0046	ND	0.15	ND	ND	ND

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 8. Pretreated Batch Mod 537 MAX Results – Test #2 (Continued)
'B' TRAIN (PRE-B)

Date	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	ADONA	F-35 Major	F-35 Minor	NaDONA	NEtFOSA	NEtFOSE	NEtFOSAA	NMeFOSA	NMeFOSE	NMeFOSAA	PFBS	PFBA	PFDS	PFDA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.020	0.020	0.020	0.0021	0.0020	0.0020	0.0021	0.0020	0.0020	0.020	0.0020	0.0040	0.020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	0.12	ND	ND
8/10/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND
8/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND
8/16/2019	ND	ND	0.77[1]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND
8/19/2019	ND	ND	0.027[1]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
8/26/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND
9/03/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
9/06/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
9/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND

Date	PFDoS	PFDoA	PFHpS	PFHpA	PFHxS	PFHxA	PFHxDA	PFODA	PFNS	PFNA	FOSA	PFOS	PFOA	PFPeS	PFPeA	PFTeA	PFTriA	PFUnA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	0.016	ND	0.019	ND	ND	ND	ND	ND	ND	0.011	ND	0.16	ND	ND	ND
8/10/2019	ND	ND	ND	0.016	ND	0.020	ND	ND	ND	ND	ND	ND	0.011	ND	0.17	ND	ND	ND
8/13/2019	ND	ND	ND	0.018	ND	0.021	ND	ND	ND	ND	ND	ND	0.012	ND	0.17	ND	ND	ND
8/14/2019	ND	ND	ND	0.018	ND	0.021	ND	ND	ND	ND	ND	ND	0.011	ND	0.17	ND	ND	ND
8/16/2019	ND	ND	ND	0.017	ND	0.021	ND	ND	ND	ND	ND	ND	0.012	ND	0.16	ND	ND	ND
8/19/2019	ND	ND	ND	0.017	ND	0.022	ND	ND	ND	ND	ND	ND	0.011	ND	0.17	ND	ND	ND
8/23/2019	ND	ND	ND	0.018	ND	0.021	ND	ND	ND	ND	ND	ND	0.011	ND	0.17	ND	ND	ND
8/26/2019	ND	ND	ND	0.016	ND	0.021	ND	ND	ND	ND	ND	ND	0.010	ND	0.17	ND	ND	ND
8/30/2019	ND	ND	ND	0.018	ND	0.021	ND	ND	ND	ND	ND	ND	0.0089	ND	0.18	ND	ND	ND
9/03/2019	ND	ND	ND	0.015	ND	0.020	ND	ND	ND	ND	ND	ND	0.0078	ND	0.17	ND	ND	ND
9/06/2019	ND	ND	ND	0.014	ND	0.019	ND	ND	ND	ND	ND	ND	0.0078	ND	0.16	ND	ND	ND
9/09/2019	ND	ND	ND	0.013	ND	0.019	ND	ND	ND	ND	ND	ND	0.0075	ND	0.16	ND	ND	ND
9/13/2019	ND	ND	ND	0.012	ND	0.018	ND	ND	ND	ND	ND	ND	0.0044	ND	0.16	ND	ND	ND

[1] Analytical artifact assumed.
Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 9. Column 1 Effluent Mod 537 MAX Results – Test #2
'A' TRAIN (GAC 1A)

Date	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	ADONA	F-35 Major	F-35 Minor	NaDONA	NEtFOSA	NEtFOSE	NEtFOSAA	NMeFOSA	NMeFOSE	NMeFOSAA	PFBS	PFBA	PFDS	PFDA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.020	0.020	0.020	0.0021	0.0020	0.0020	0.0021	0.0020	0.0020	0.020	0.0020	0.0040	0.020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND	ND
8/08/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/10/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/15/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/16/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/17/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/18/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/21/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/27/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0030	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0050	ND	ND
9/03/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.021	ND	ND
9/04/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.025	ND	ND
9/10/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.060	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.087	ND	ND

Date	PFDoS	PFDoA	PFHpS	PFHpA	PFHxS	PFHxA	PFHxDA	PFODA	PFNS	PFNA	FOSA	PFOS	PFOA	PFPeS	PFPeA	PFTeA	PFTriA	PFUnA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/08/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/10/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/15/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/16/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/17/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/18/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/21/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/27/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/03/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0032	ND	ND	ND
9/04/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0049	ND	ND	ND
9/10/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.018	ND	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.028	ND	ND	ND

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 9. Column 1 Effluent Mod 537 MAX Results – Test #2 (Continued)

'B' TRAIN (GAC 1B)

Date	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	ADONA	F-35 Major	F-35 Minor	NaDONA	NEtFOSA	NEtFOSE	NEtFOSAA	NMeFOSA	NMeFOSE	NMeFOSAA	PFBS	PFBA	PFDS	PFDA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.020	0.020	0.020	0.0021	0.0020	0.0020	0.0021	0.0020	0.0020	0.020	0.0020	0.0040	0.020	0.0020	0.0020	0.0020	0.0020
8/7/2019	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	ND	ND	ND
8/8/2019	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	0.022	ND	ND
8/9/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.048	ND	ND
8/10/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.065	ND	ND
8/12/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.053	ND	ND
8/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.075	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.092	ND	ND
8/15/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.099	ND	ND
8/16/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.10	ND	ND
8/17/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.097	ND	ND
8/18/2019	ND	ND	0.038	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.090	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND
8/21/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.10	ND	ND
8/27/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND
9/3/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND
9/4/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND
9/6/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND
9/10/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND

Date	PFDoS	PFDoA	PFHpS	PFHpA	PFHxS	PFHxA	PFHxDA	PFODA	PFNS	PFNA	FOSA	PFOS	PFOA	PFPeS	PFPeA	PFTeA	PFTriA	PFUnA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
8/7/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/8/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/9/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0024	ND	ND	ND
8/10/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0071	ND	ND	ND
8/12/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0039	ND	ND	ND
8/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.014	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.035	ND	ND	ND
8/15/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.051	ND	ND	ND
8/16/2019	ND	ND	ND	ND	ND	0.0024	ND	ND	ND	ND	ND	ND	ND	ND	0.065	ND	ND	ND
8/17/2019	ND	ND	ND	ND	ND	0.0025	ND	ND	ND	ND	ND	ND	ND	ND	0.066	ND	ND	ND
8/18/2019	ND	ND	ND	ND	ND	0.0073	ND	ND	ND	ND	ND	ND	ND	ND	0.061	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	0.0033	ND	ND	ND	ND	ND	ND	ND	ND	0.076	ND	ND	ND
8/21/2019	ND	ND	ND	ND	ND	0.0052	ND	ND	ND	ND	ND	ND	ND	ND	0.093	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	0.0052	ND	ND	ND	ND	ND	ND	ND	ND	0.095	ND	ND	ND
8/27/2019	ND	ND	ND	0.0048	ND	0.0092	ND	ND	ND	ND	ND	ND	0.0024	ND	0.12	ND	ND	ND
8/30/2019	ND	ND	ND	0.0047	ND	0.011	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND	ND
9/3/2019	ND	ND	ND	0.0066	ND	0.014	ND	ND	ND	ND	ND	ND	0.0030	ND	0.16	ND	ND	ND
9/4/2019	ND	ND	ND	0.0077	ND	0.014	ND	ND	ND	ND	ND	ND	0.0032	ND	0.14	ND	ND	ND
9/6/2019	ND	ND	ND	0.0075	ND	0.014	ND	ND	ND	ND	ND	ND	0.0036	ND	0.14	ND	ND	ND
9/10/2019	ND	ND	ND	0.0080	ND	0.015	ND	ND	ND	ND	ND	ND	0.0038	ND	0.16	ND	ND	ND
9/13/2019	ND	ND	ND	0.0087	ND	0.015	ND	ND	ND	ND	ND	ND	0.0032	ND	0.16	ND	ND	ND

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 10. Column 2 Effluent Mod 537 MAX Results – Test #2
'A' TRAIN (GAC 2A)

Date	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	ADONA	F-35 Major	F-35 Minor	NaDONA	NEtFOSA	NEtFOSE	NEtFOSAA	NMeFOSA	NMeFOSE	NMeFOSAA	PFBS	PFBA	PFDS	PFDA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.020	0.020	0.020	0.0021	0.0020	0.0020	0.0021	0.0020	0.0020	0.020	0.0020	0.0040	0.020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/16/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/21/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/28/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/04/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/11/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Date	PFDoS	PFDoA	PFHpS	PFHpA	PFHxS	PFHxA	PFHxDA	PFODA	PFNS	PFNA	FOSA	PFOS	PFOA	PFPeS	PFPeA	PFTeA	PFTriA	PFUnA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/16/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/21/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/28/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/04/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/11/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 10. Column 2 Effluent Mod 537 MAX Results – Test #2 (Continued)
'B' TRAIN (GAC 2B)

Date	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	ADONA	F-35 Major	F-35 Minor	NaDONA	NEtFOSA	NEtFOSE	NEtFOSAA	NMeFOSA	NMeFOSE	NMeFOSAA	PFBS	PFBA	PFDS	PFDA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.020	0.020	0.020	0.0021	0.0020	0.0020	0.0021	0.0020	0.0020	0.020	0.0020	0.0040	0.020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0040	ND	ND
8/12/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.011	ND	ND
8/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.018	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.032	ND	ND
8/16/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.051	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.062	ND	ND
8/21/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.067	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.070	ND	ND
8/28/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.094	ND	ND
9/04/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND
9/11/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.15	ND	ND

Date	PFDoS	PFDoA	PFHpS	PFHpA	PFHxS	PFHxA	PFHxDA	PFODA	PFNS	PFNA	FOSA	PFOS	PFOA	PFPeS	PFPeA	PFTeA	PFTriA	PFUnA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/12/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/16/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0031	ND	ND	ND
8/21/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0042	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0060	ND	ND	ND
8/28/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.015	ND	ND	ND
9/04/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.044	ND	ND	ND
9/11/2019	ND	ND	ND	ND	ND	0.0022	ND	ND	ND	ND	ND	ND	ND	ND	0.085	ND	ND	ND
9/13/2019	ND	ND	ND	ND	ND	0.0058	ND	ND	ND	ND	ND	ND	ND	ND	0.13	ND	ND	ND

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 11. Column 3 Effluent Mod 537 MAX Results – Test #2
'A' TRAIN (GAC 3A)

Date	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	ADONA	F-35 Major	F-35 Minor	NaDONA	NEtFOSA	NEtFOSE	NEtFOSAA	NMeFOSA	NMeFOSE	NMeFOSAA	PFBS	PFBA	PFDS	PFDA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.020	0.020	0.020	0.0021	0.0020	0.0020	0.0021	0.0020	0.0020	0.020	0.0020	0.0040	0.020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/03/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.022	ND	ND
9/06/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Date	PFDoS	PFDoA	PFHpS	PFHpA	PFHxS	PFHxA	PFHxDA	PFODA	PFNS	PFNA	FOSA	PFOS	PFOA	PFPeS	PFPeA	PFTeA	PFTriA	PFUnA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	0.0020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/03/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0030	ND	ND	ND
9/06/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 11. Column 3 Effluent Mod 537 MAX Results – Test #2 (Continued)
'B' TRAIN (GAC 3B)

Date	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	ADONA	F-35 Major	F-35 Minor	NaDONA	NEtFOSA	NEtFOSE	NEtFOSAA	NMeFOSA	NMeFOSE	NMeFOSAA	PFBS	PFBA	PFDS	PFDA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.020	0.020	0.020	0.0021	0.0020	0.0020	0.0021	0.0020	0.0020	0.020	0.0020	0.0040	0.020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0074	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.029	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.038	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.052	ND	ND
9/06/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.063	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	ND	ND

Date	PFDoS	PFDoA	PFHpS	PFHpA	PFHxS	PFHxA	PFHxDA	PFODA	PFNS	PFNA	FOSA	PFOS	PFOA	PFPeS	PFPeA	PFTeA	PFTriA	PFUnA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/06/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0023	ND	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.015	ND	ND	ND

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

Table 12. Column 4 Effluent Mod 537 MAX Results – Test #2
'A' TRAIN (GAC 4A)

Date	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	ADONA	F-35 Major	F-35 Minor	NaDONA	NEtFOSA	NEtFOSE	NEtFOSAA	NMeFOSA	NMeFOSE	NMeFOSAA	PFBS	PFBA	PFDS	PFDA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.020	0.020	0.020	0.0021	0.0020	0.0020	0.0021	0.0020	0.0020	0.020	0.0020	0.0040	0.020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	0.032	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/06/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Date	PFDoS	PFDoA	PFHpS	PFHpA	PFHxS	PFHxA	PFHxDA	PFODA	PFNS	PFNA	FOSA	PFOS	PFOA	PFPeS	PFPeA	PFTeA	PFTriA	PFUnA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	0.0041	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/06/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

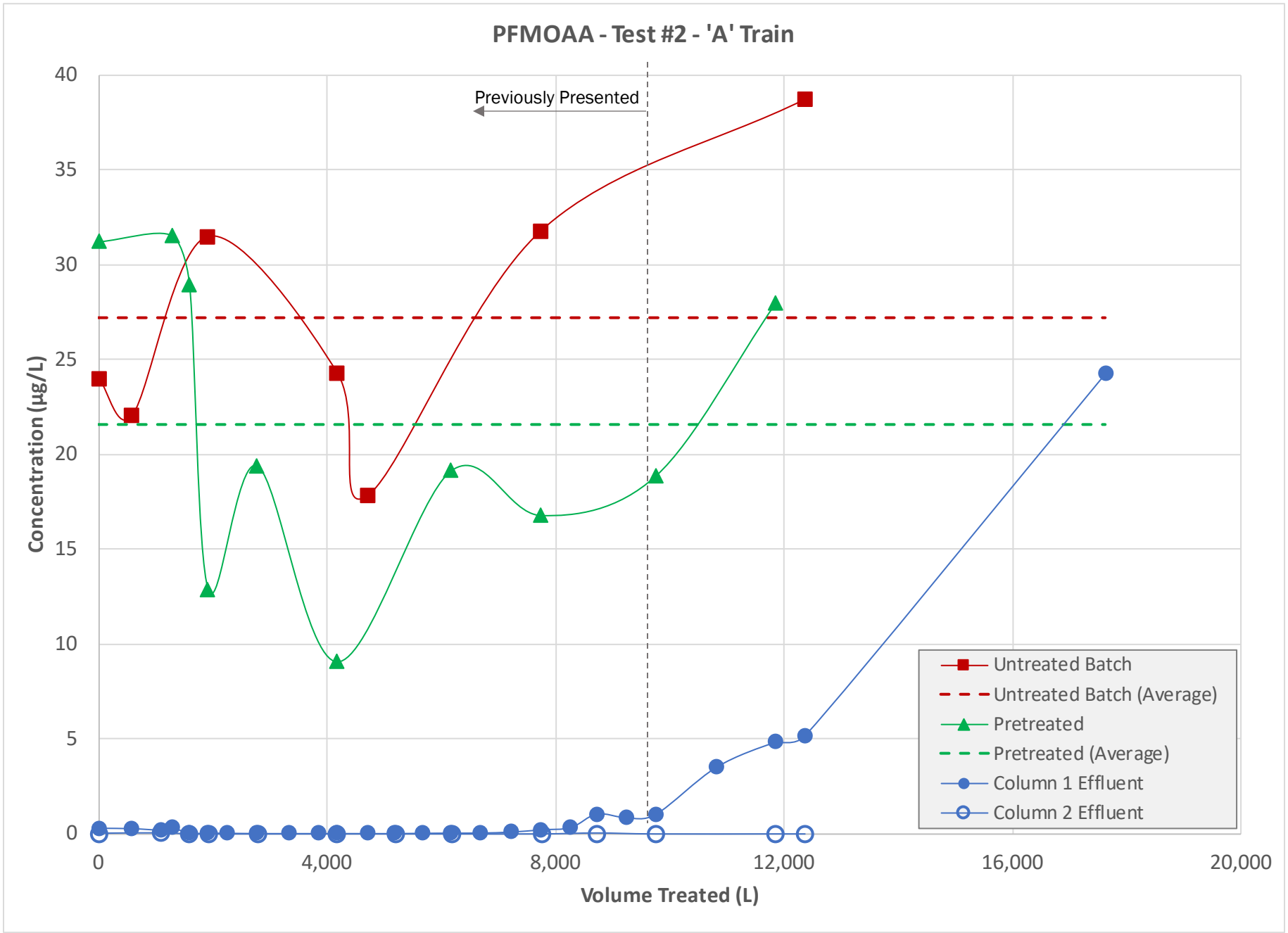
Table 12. Column 4 Effluent Mod 537 MAX Results – Test #2 (Continued)
'B' TRAIN (GAC 4B)

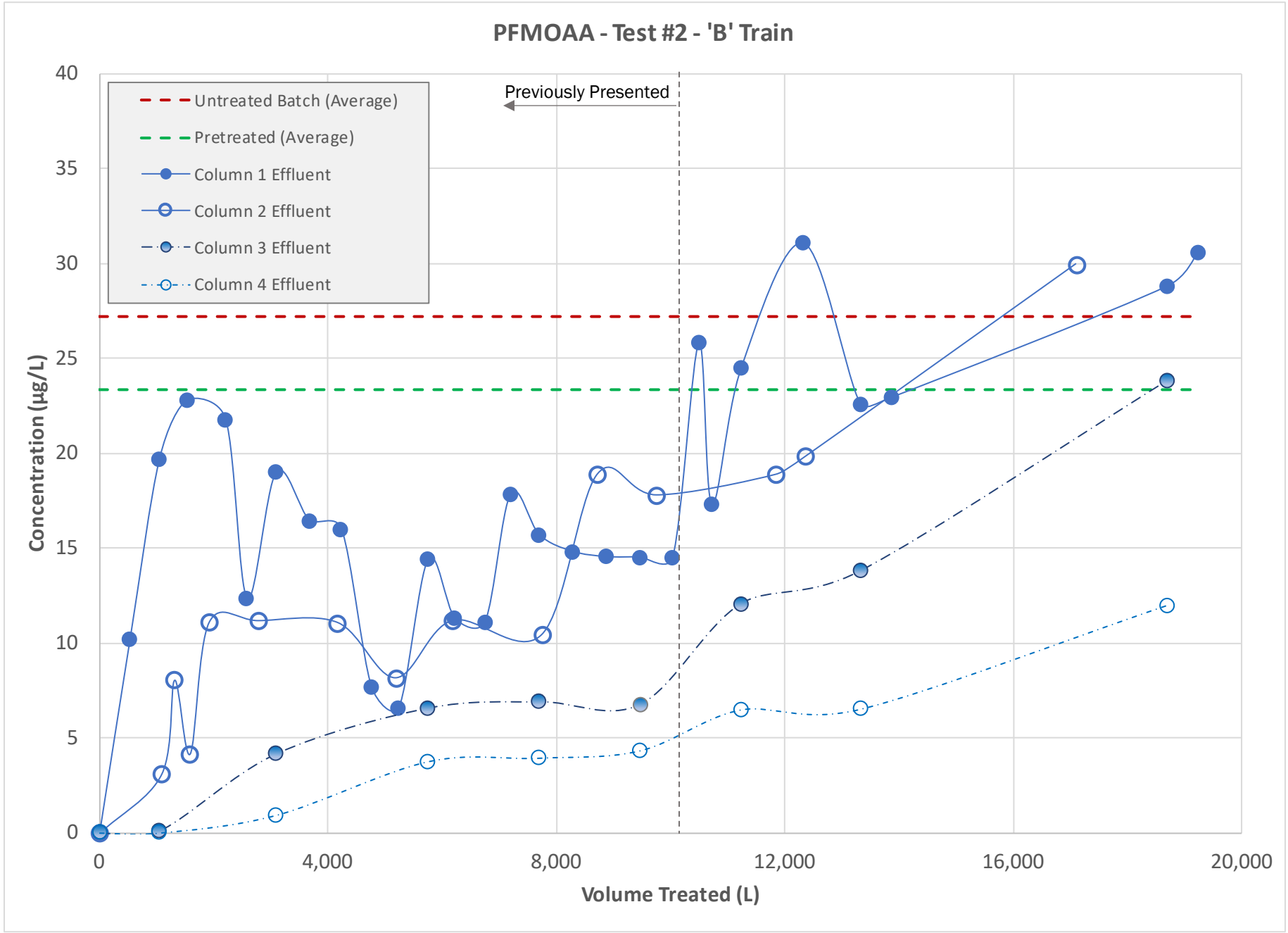
Date	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	ADONA	F-35 Major	F-35 Minor	NaDONA	NEtFOSA	NEtFOSE	NEtFOSAA	NMeFOSA	NMeFOSE	NMeFOSAA	PFBS	PFBA	PFDS	PFDA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.020	0.020	0.020	0.0021	0.0020	0.0020	0.0021	0.0020	0.0020	0.020	0.0020	0.0040	0.020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	--	--	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.011	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.016	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.026	ND	ND
9/06/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.027	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.055	ND	ND

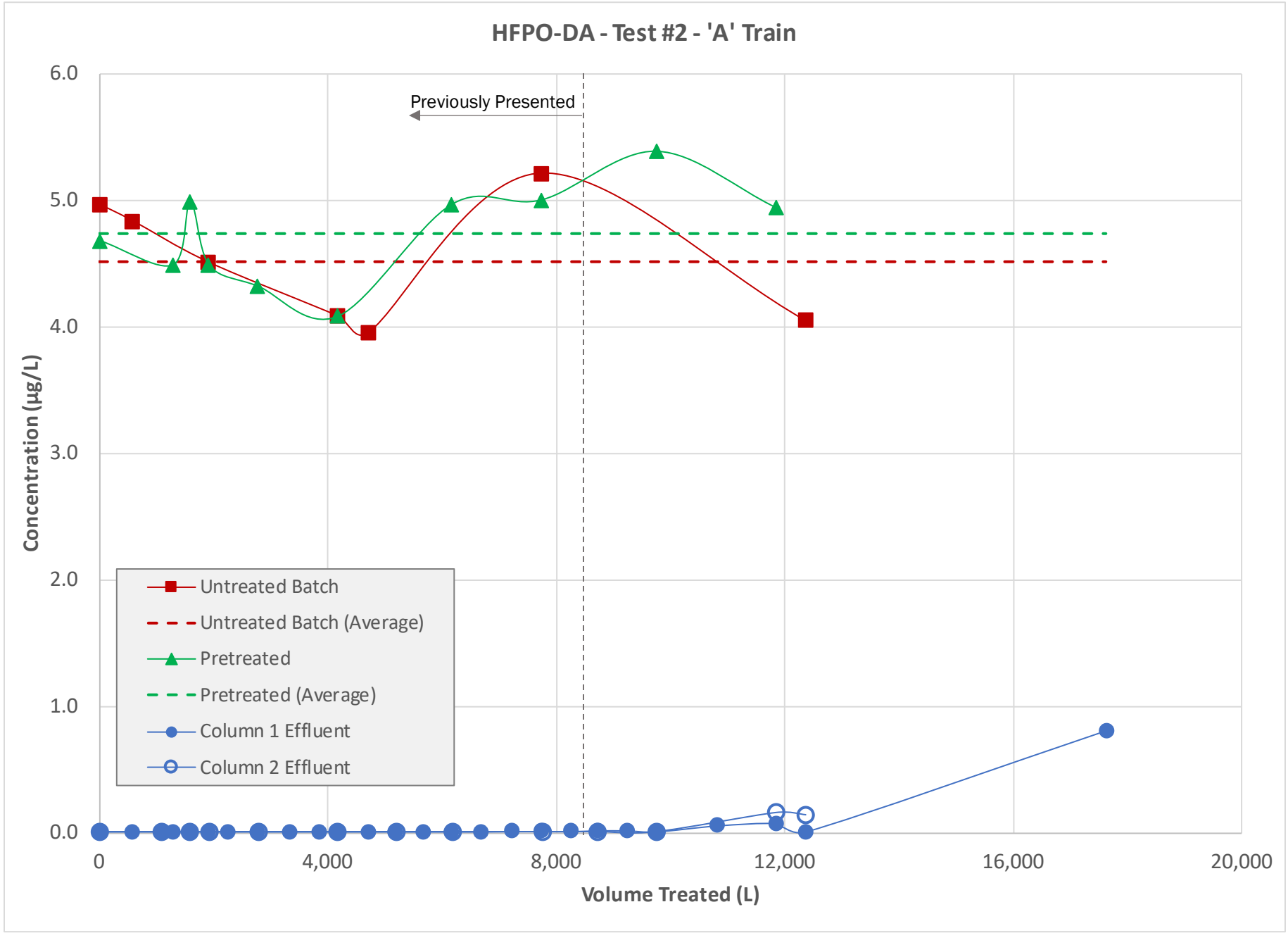
Date	PFDoS	PFDoA	PFHpS	PFHpA	PFHxS	PFHxA	PFHxDA	PFODA	PFNS	PFNA	FOSA	PFOS	PFOA	PFPeS	PFPeA	PFTeA	PFTriA	PFUnA
	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
MRL	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
8/07/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/09/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/14/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/23/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/30/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/06/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/13/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

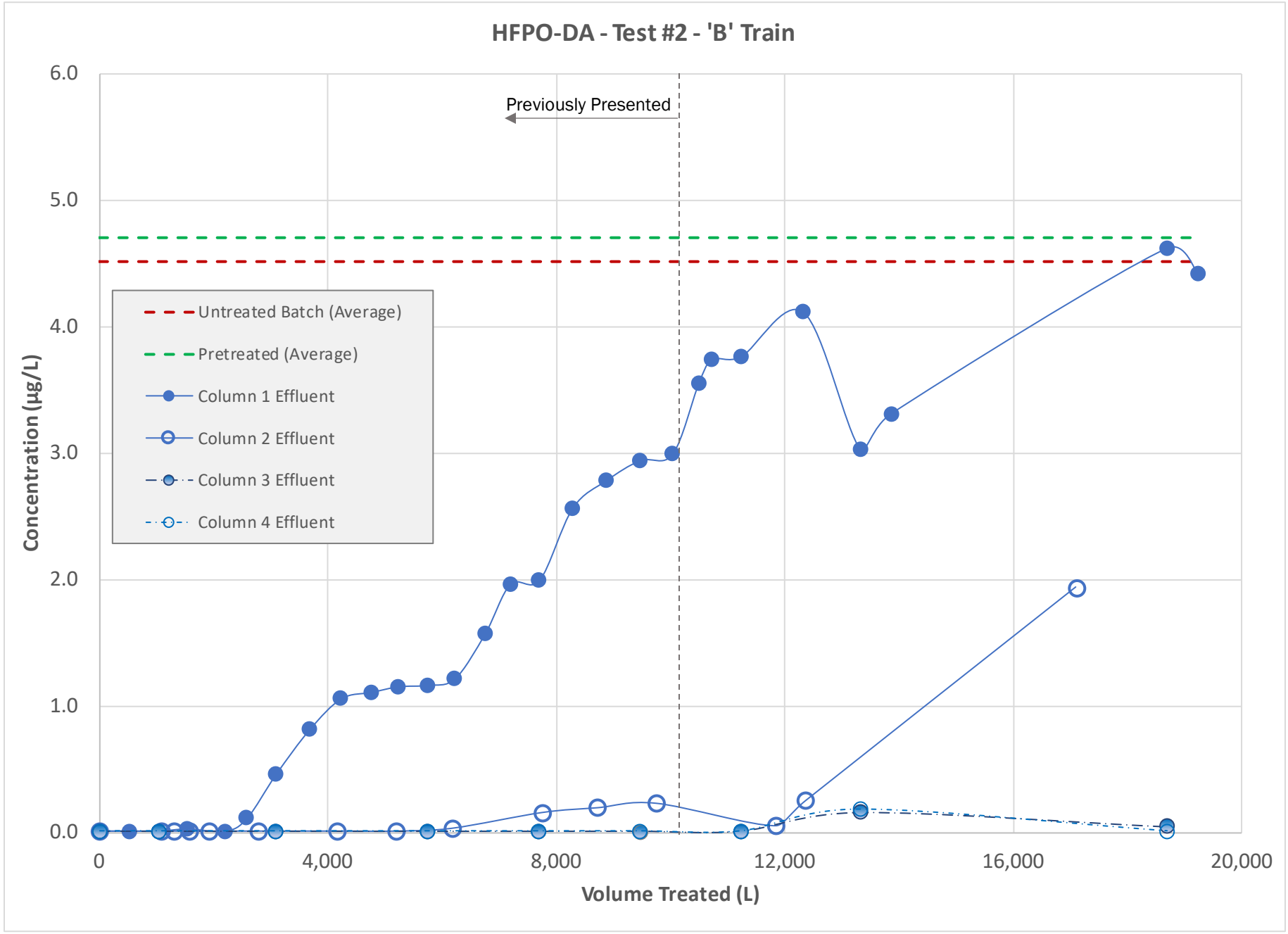
Grey-shaded data were presented in the September 30 Engineering Report; unshaded portion presents additional data available since issuance of the September 30 Engineering Report.

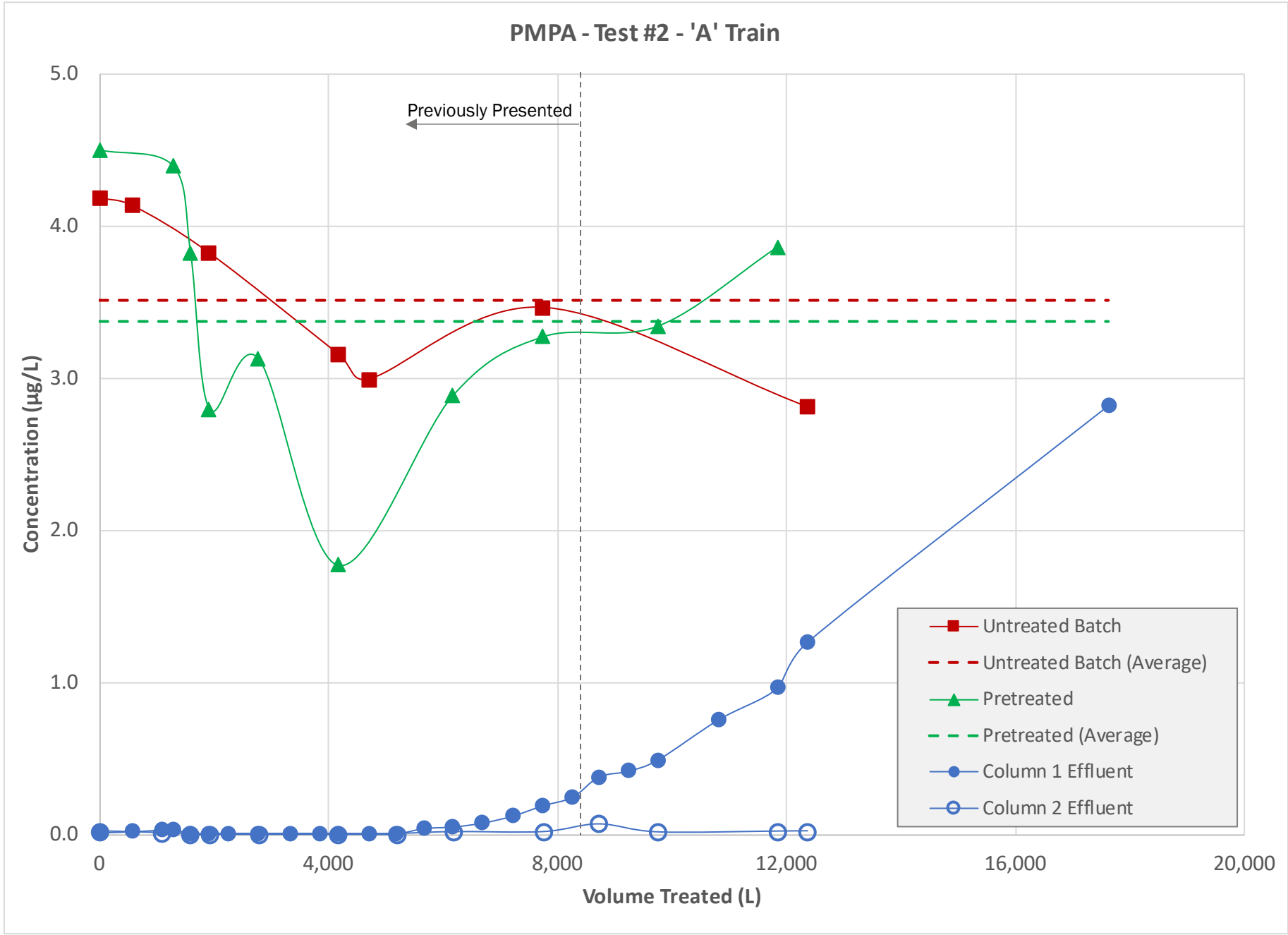
APPENDIX C
BREAKTHROUGH CURVES FOR PFMOAA, HFPO-DA, AND SELECT PARAMETERS

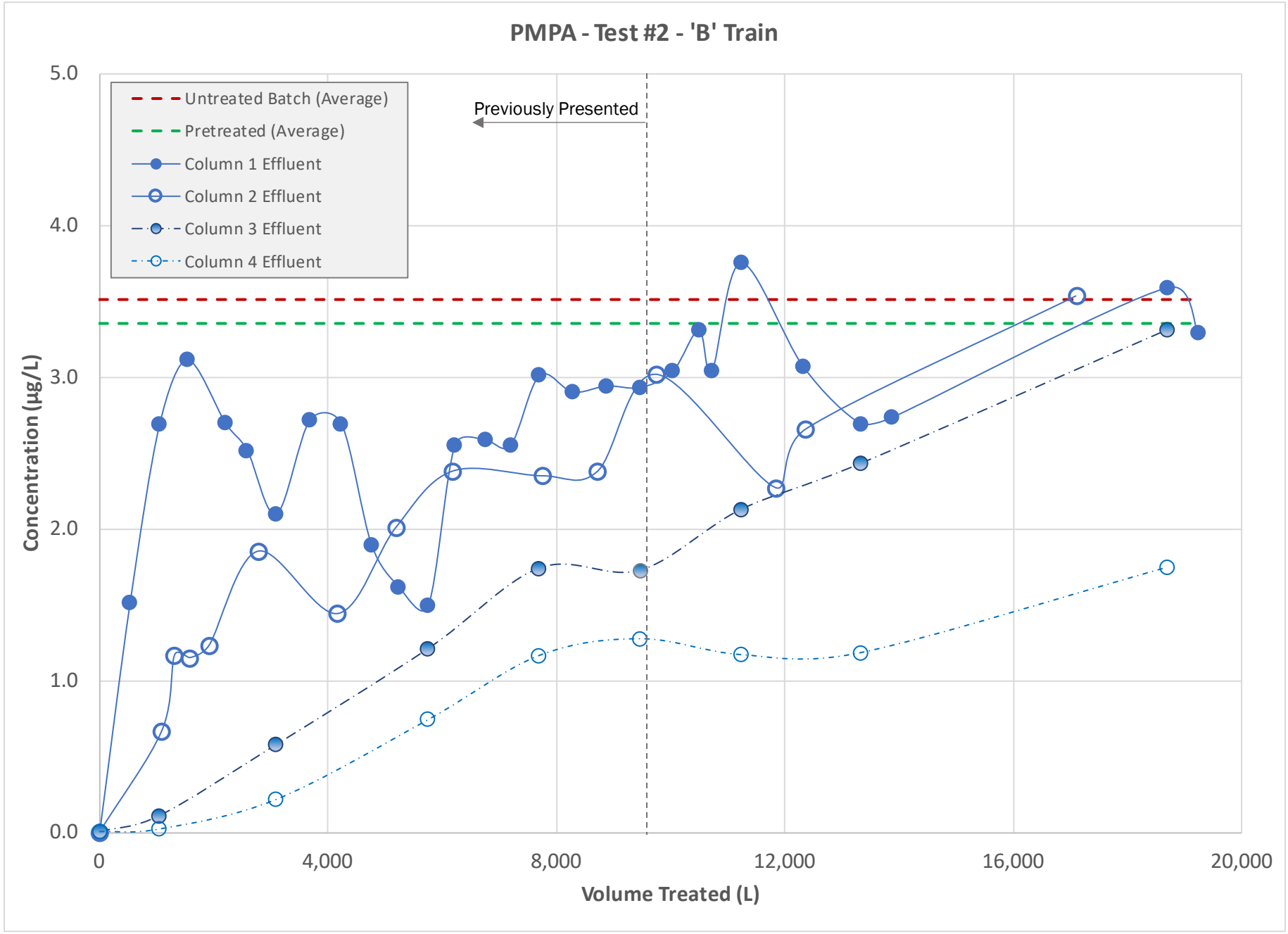

PFMOAA - Test #2 - 'A' Train
Previously Presented
Concentration (µg/L)
Volume Treated (L)
0
5
10
15
20
25
30
35
40
0
4,000
8,000
12,000
16,000
20,000
Untreated Batch
Untreated Batch (Average)
Pretreated
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent

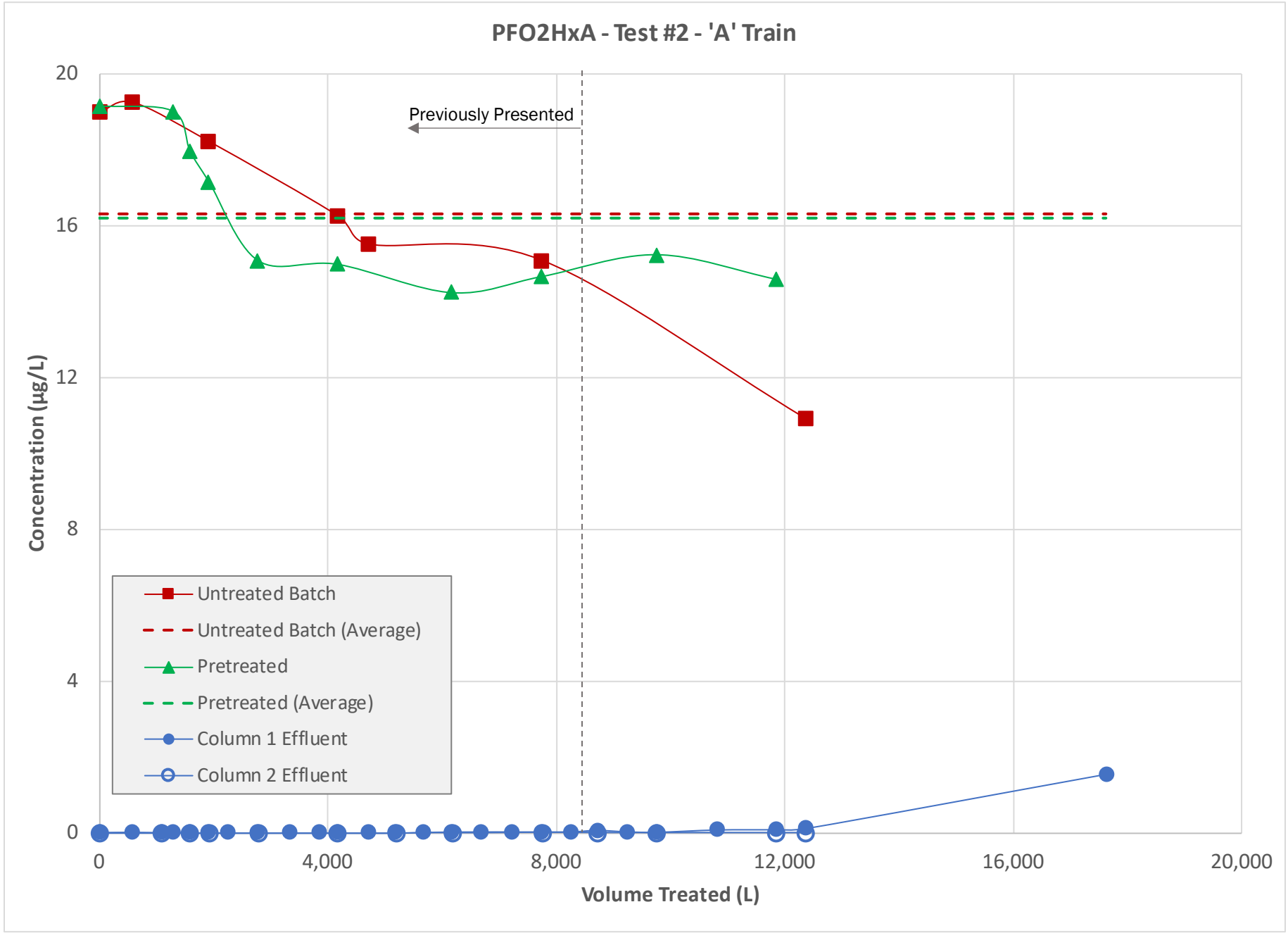

PFMOAA - Test #2 - 'B' Train
Untreated Batch (Average)
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent
Column 3 Effluent
Column 4 Effluent
Previously Presented
Concentration (µg/L)
Volume Treated (L)
0
5
10
15
20
25
30
35
40
0
4,000
8,000
12,000
16,000
20,000

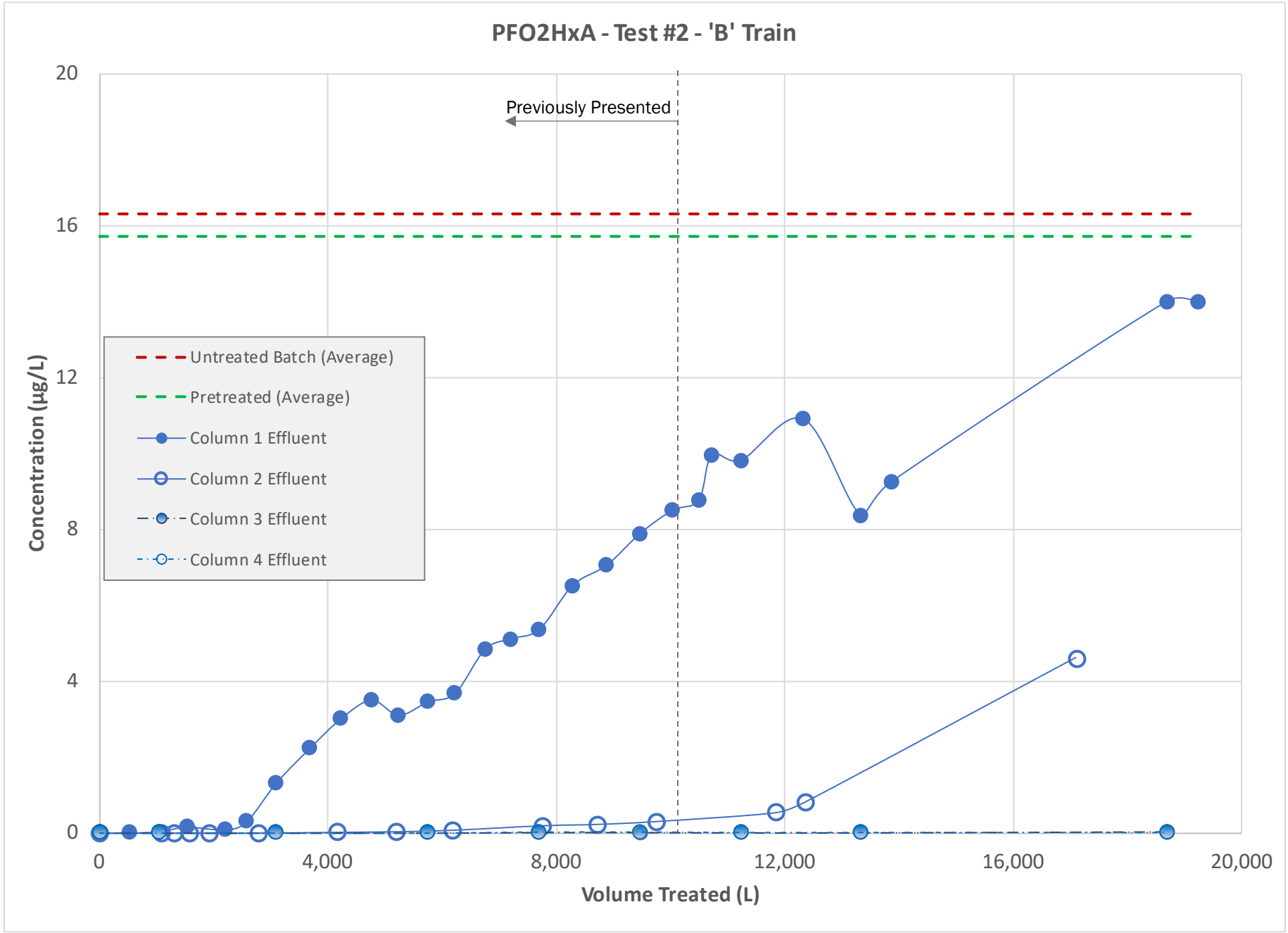

HFPO-DA - Test #2 - 'A' Train
Previously Presented
Concentration (µg/L)
Volume Treated (L)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0
4,000
8,000
12,000
16,000
20,000
Untreated Batch
Untreated Batch (Average)
Pretreated
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent

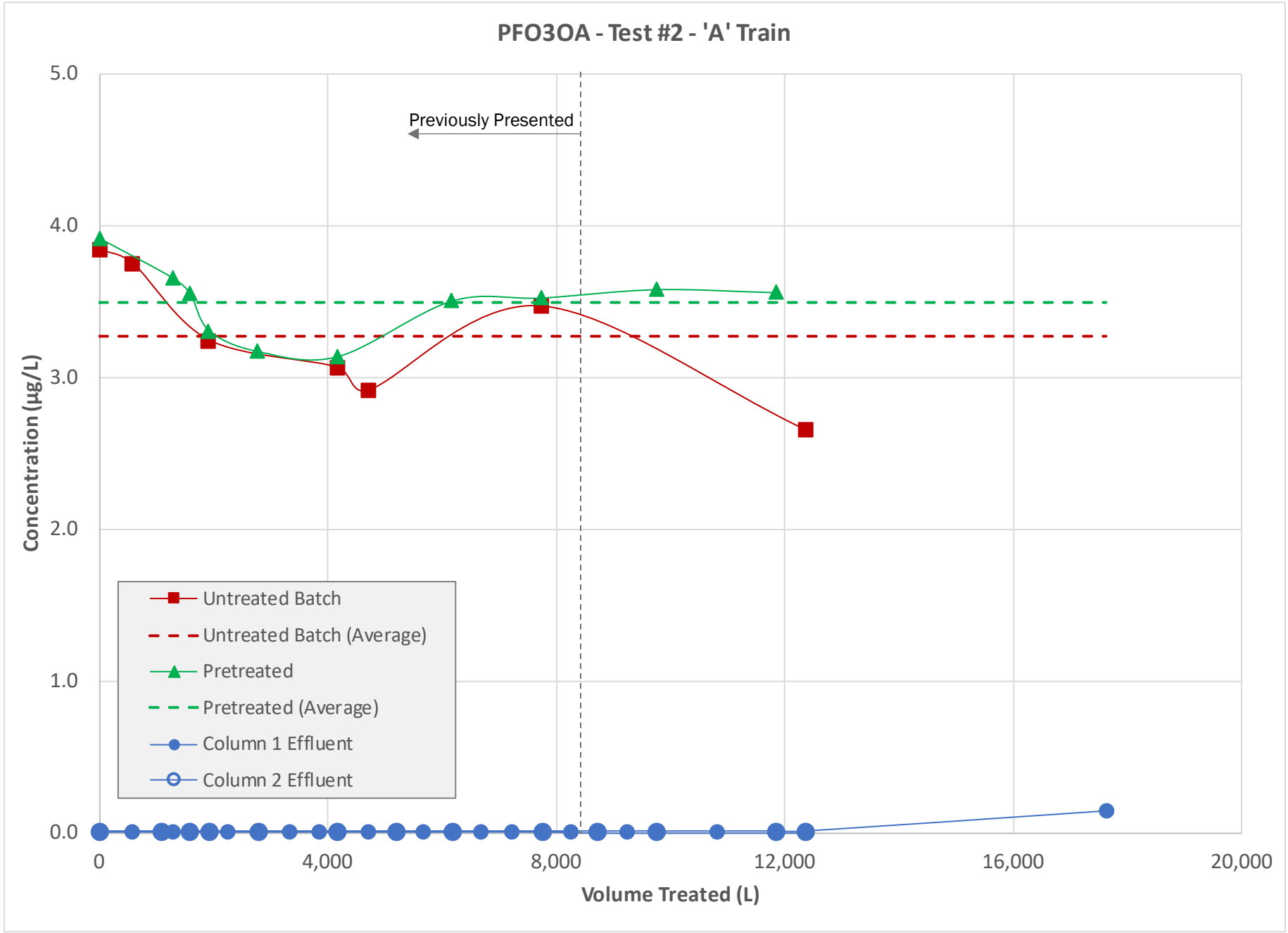

HFPO-DA - Test #2 - 'B' Train
Previously Presented
Untreated Batch (Average)
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent
Column 3 Effluent
Column 4 Effluent
Concentration (µg/L)
Volume Treated (L)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0
4,000
8,000
12,000
16,000
20,000

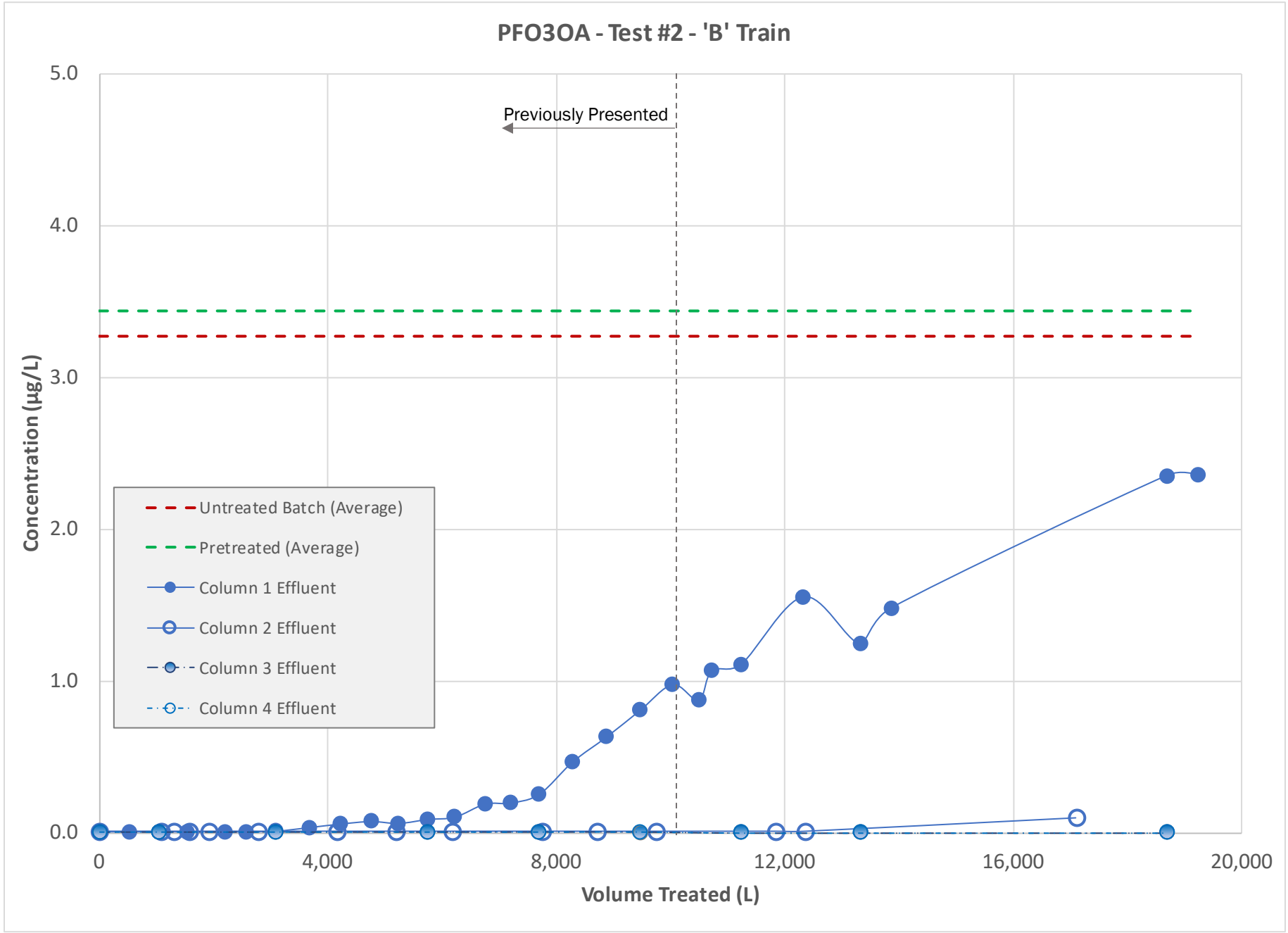

PMPA - Test #2 - 'A' Train
Previously Presented
Concentration (µg/L)
Volume Treated (L)
5.0
4.0
3.0
2.0
1.0
0.0
0
4,000
8,000
12,000
16,000
20,000
Untreated Batch
Untreated Batch (Average)
Pretreated
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent

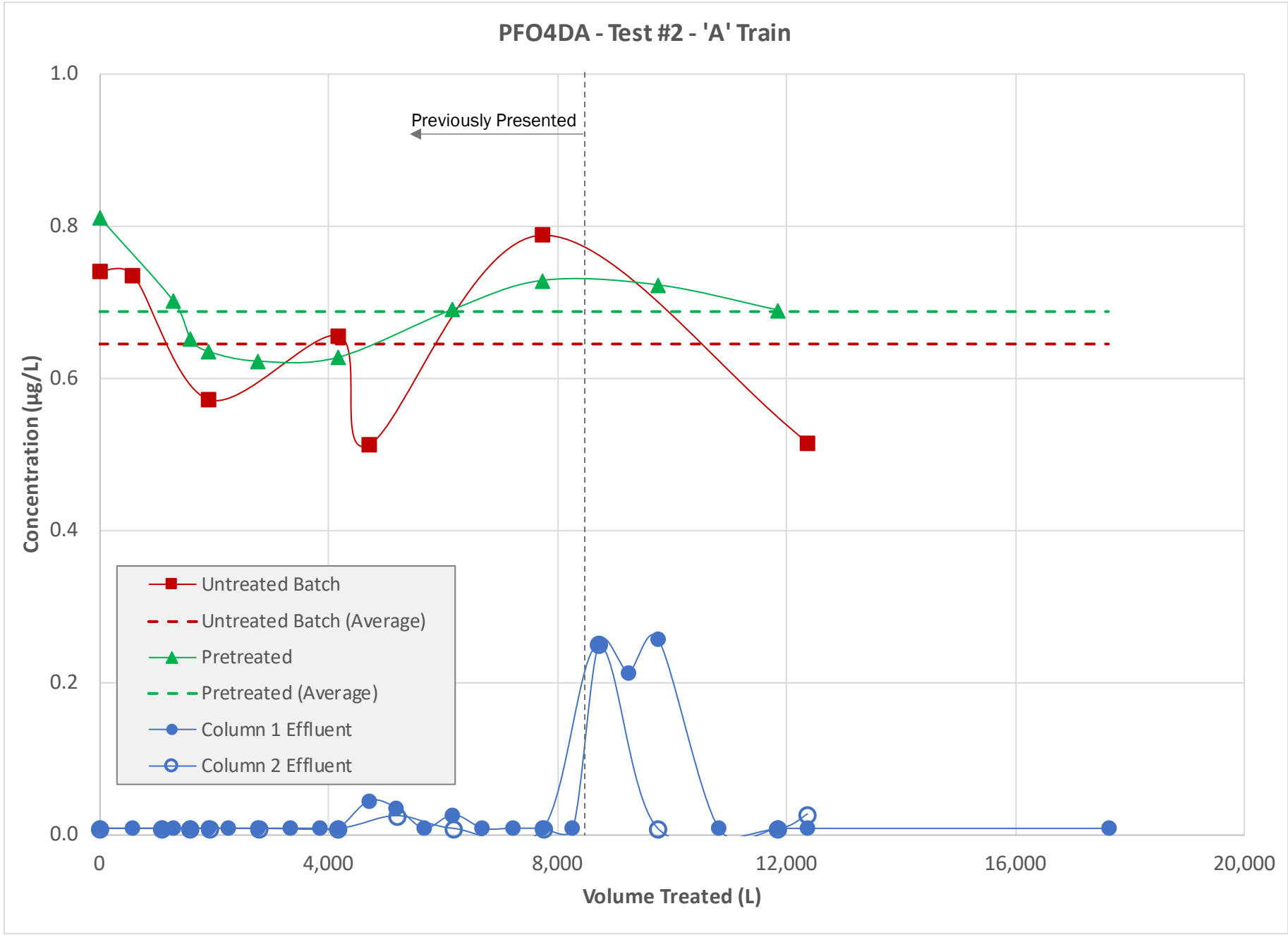

PMPA - Test #2 - 'B' Train
Untreated Batch (Average)
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent
Column 3 Effluent
Column 4 Effluent
Previously Presented
Concentration (µg/L)
5.0
4.0
3.0
2.0
1.0
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)

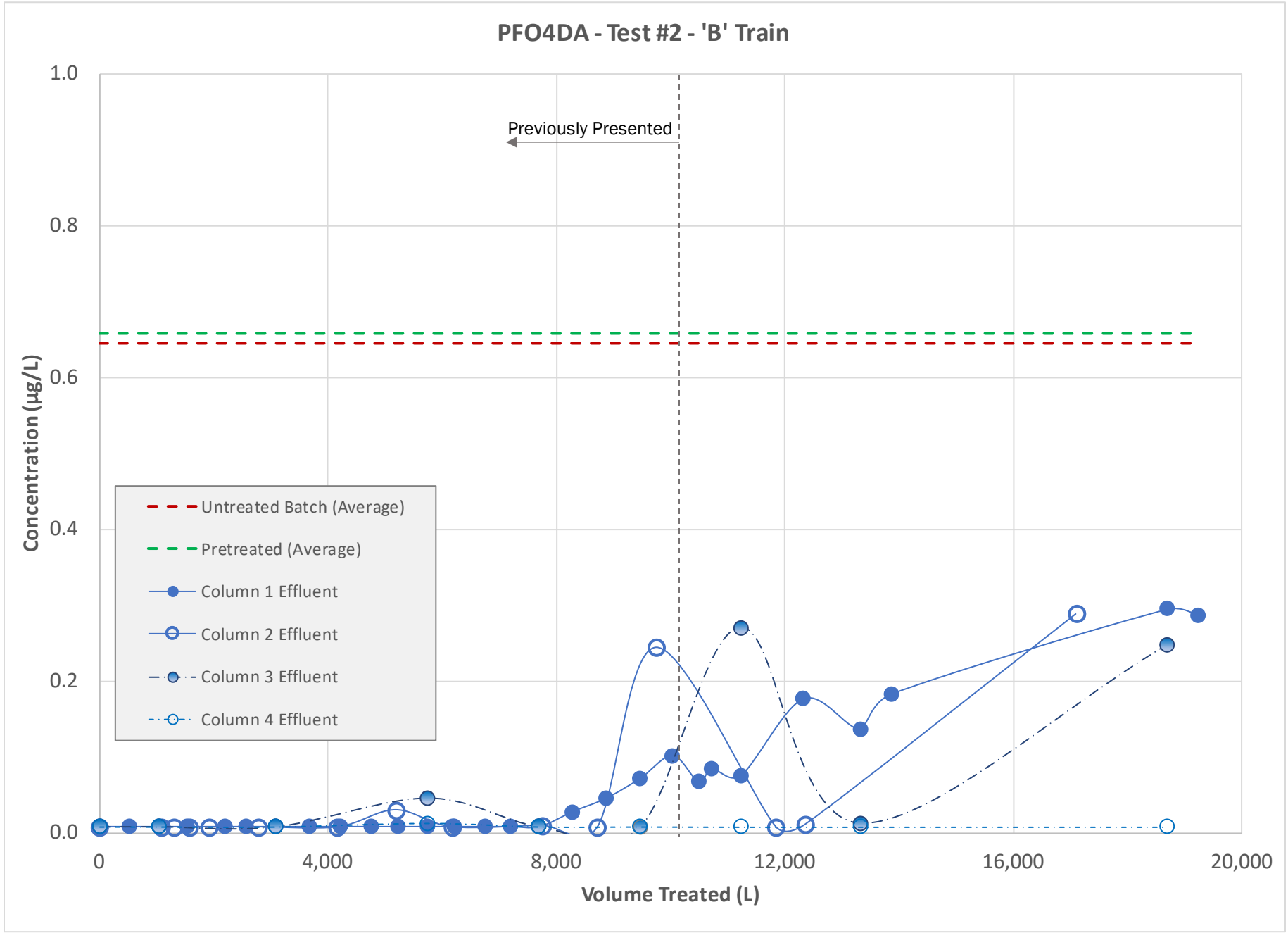

PFO2HxA - Test #2 - 'A' Train
Previously Presented
Concentration (µg/L)
Volume Treated (L)
0
4
8
12
16
20
0
4,000
8,000
12,000
16,000
20,000
Untreated Batch
Untreated Batch (Average)
Pretreated
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent

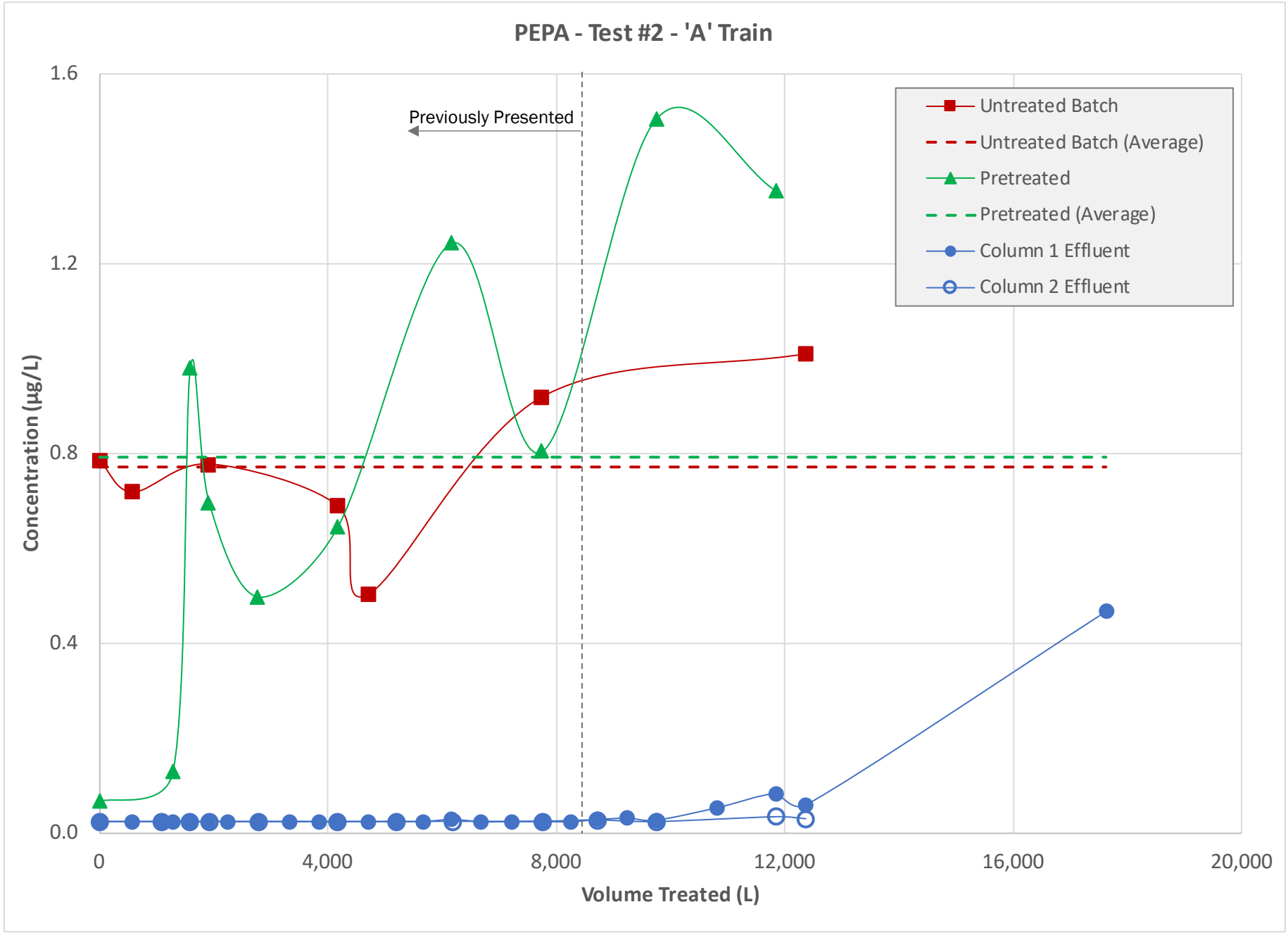

PFO2HxA - Test #2 - 'B' Train
Previously Presented
Untreated Batch (Average)
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent
Column 3 Effluent
Column 4 Effluent
Concentration (µg/L)
Volume Treated (L)
0
4
8
12
16
20
0
4,000
8,000
12,000
16,000
20,000

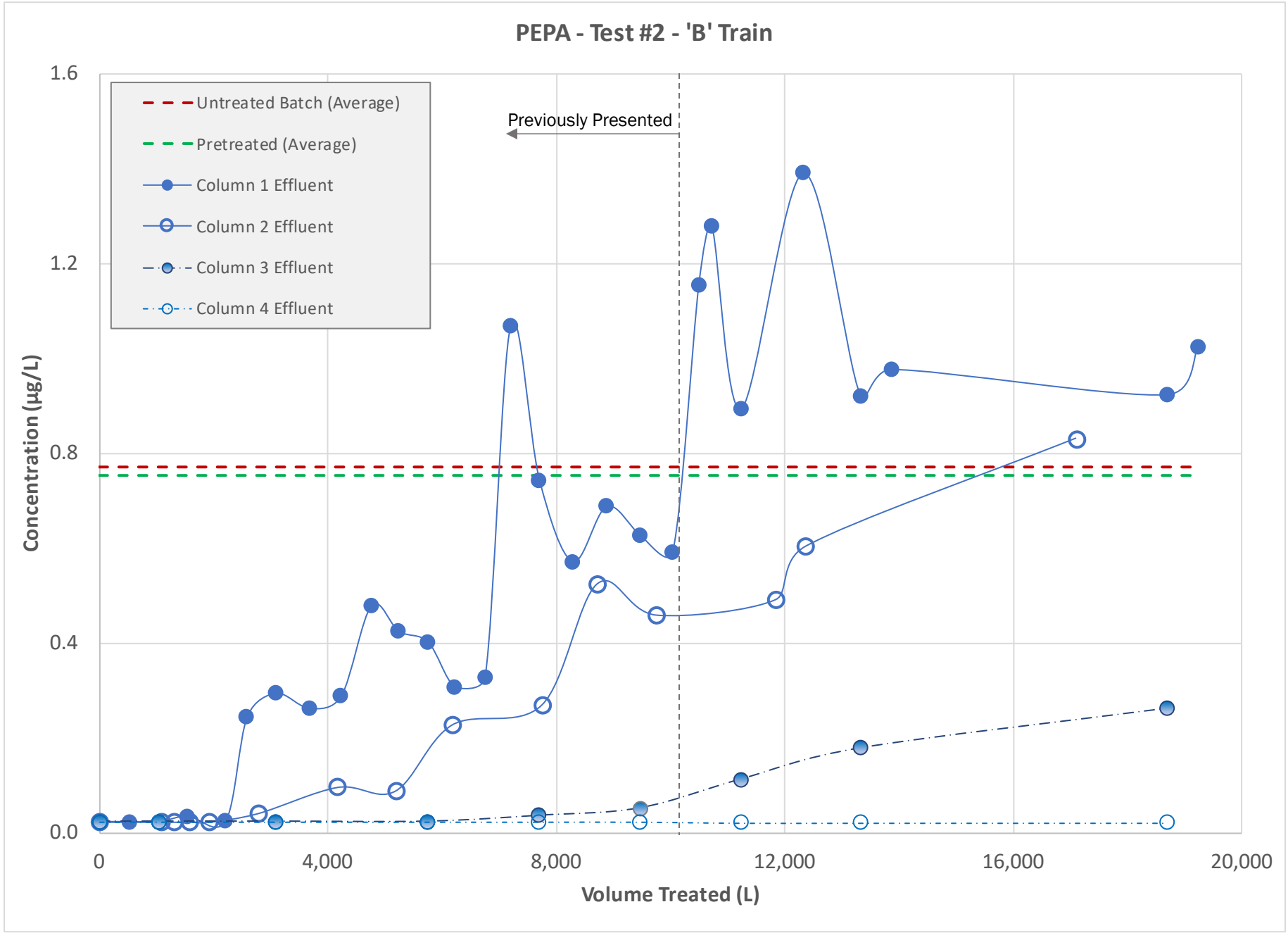

PFO3OA - Test #2 - 'A' Train
Previously Presented
Concentration (µg/L)
5.0
4.0
3.0
2.0
1.0
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)
Untreated Batch
Untreated Batch (Average)
Pretreated
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent

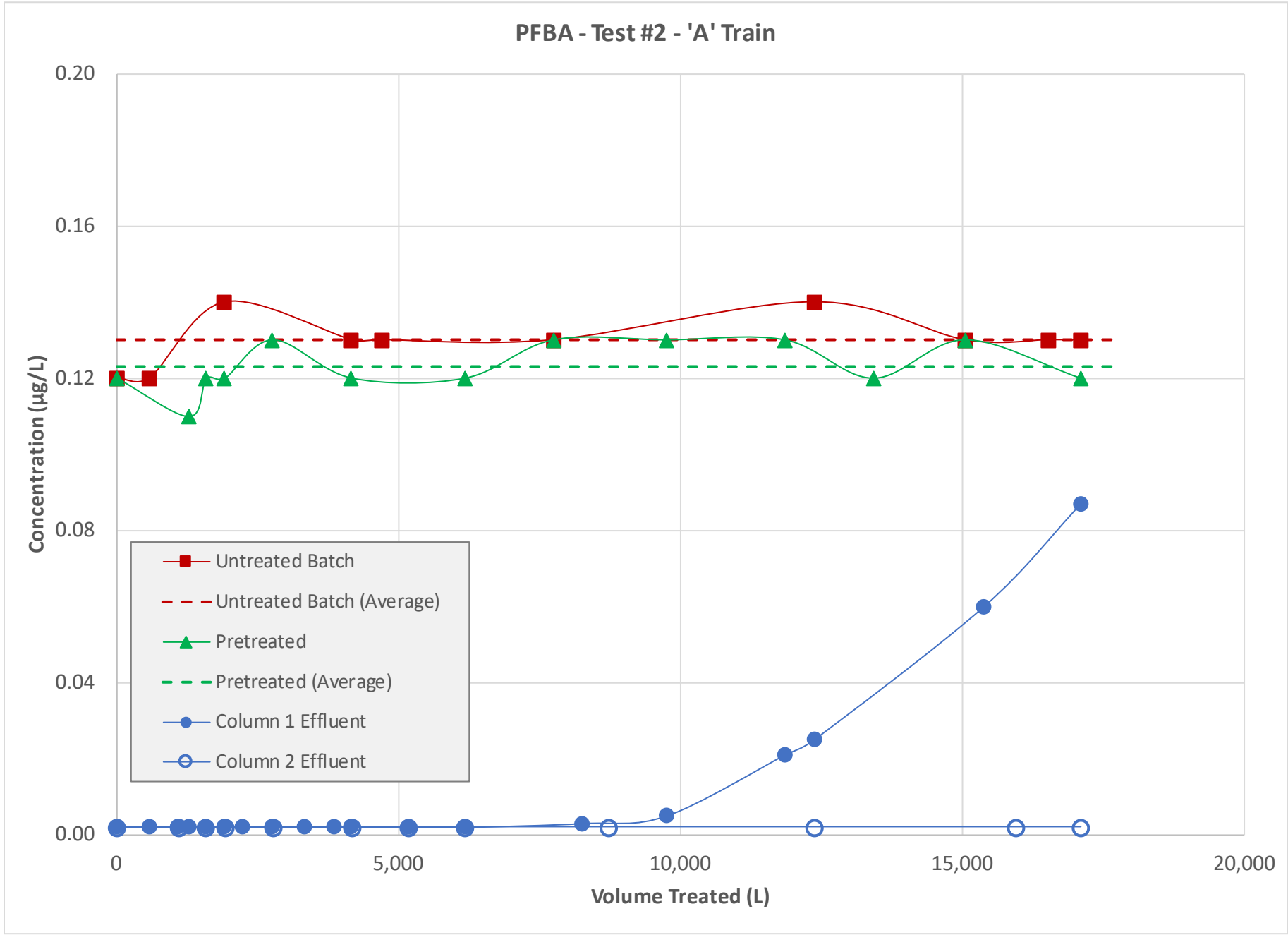

PFO3OA - Test #2 - 'B' Train
Previously Presented
Concentration (µg/L)
5.0
4.0
3.0
2.0
1.0
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)
Untreated Batch (Average)
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent
Column 3 Effluent
Column 4 Effluent

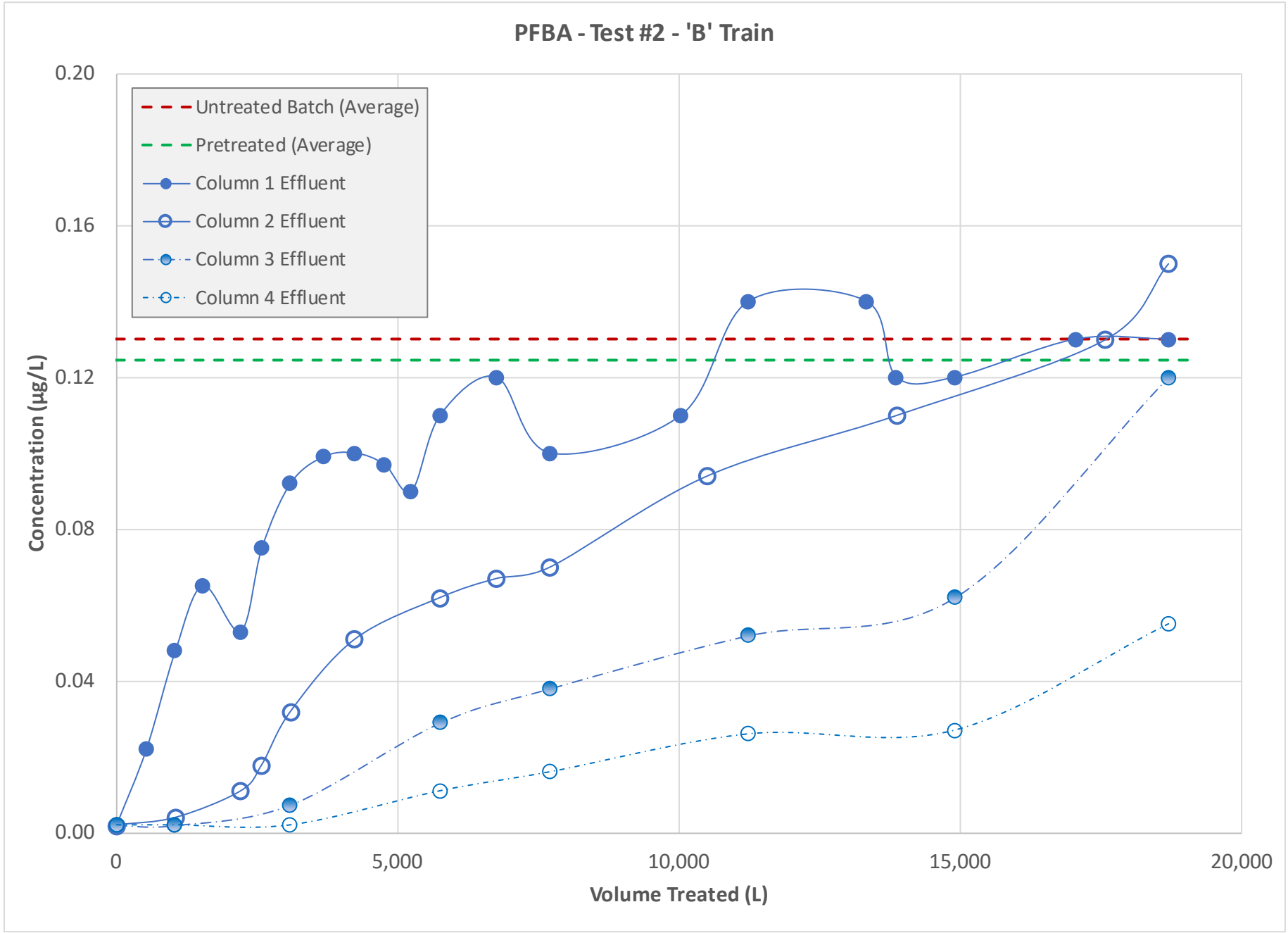

PFO4DA - Test #2 - 'A' Train
Previously Presented
Concentration (µg/L)
1.0
0.8
0.6
0.4
0.2
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)
Untreated Batch
Untreated Batch (Average)
Pretreated
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent

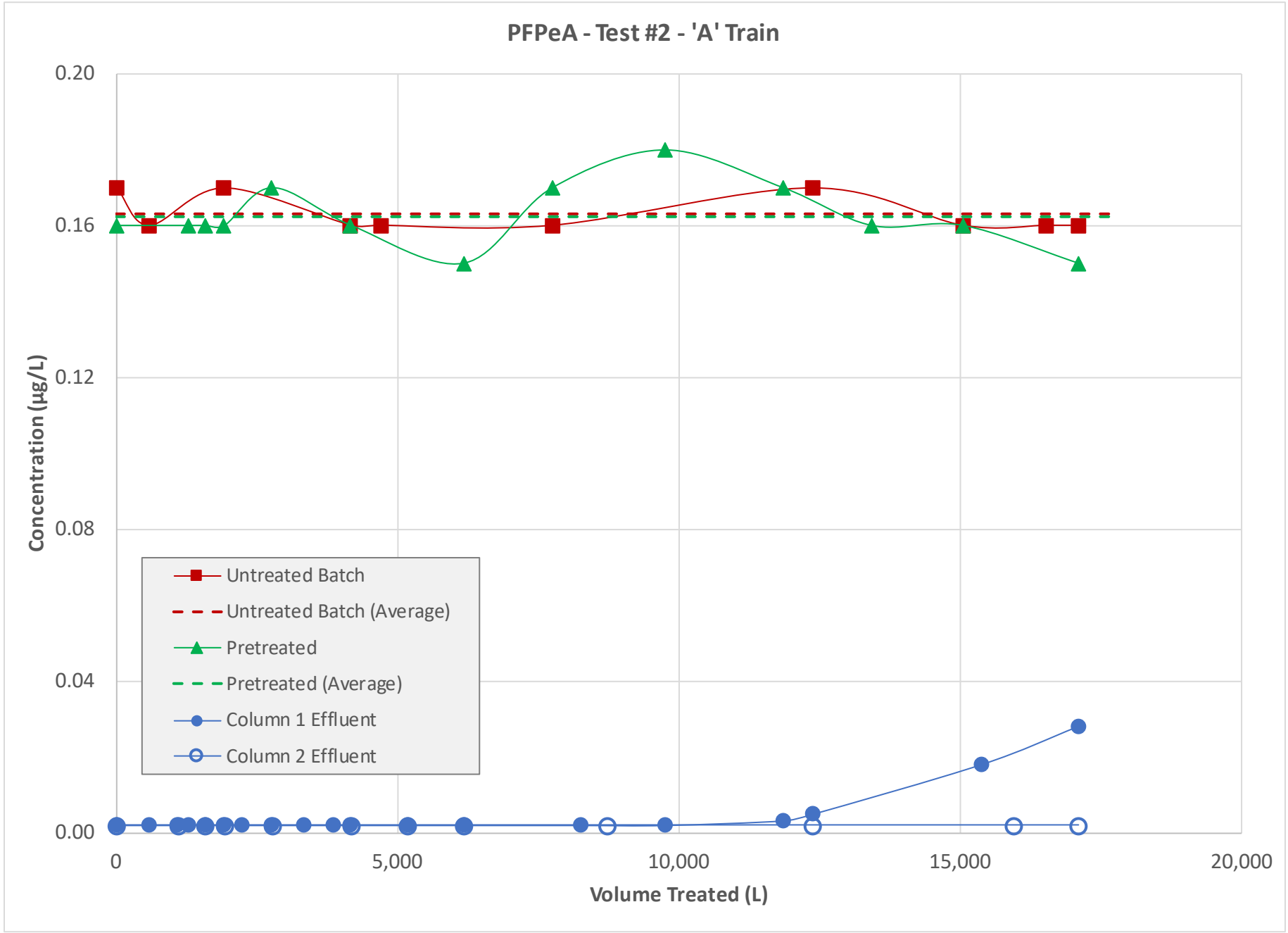

PFO4DA - Test #2 - 'B' Train
Previously Presented
Concentration (µg/L)
1.0
0.8
0.6
0.4
0.2
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)
Untreated Batch (Average)
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent
Column 3 Effluent
Column 4 Effluent

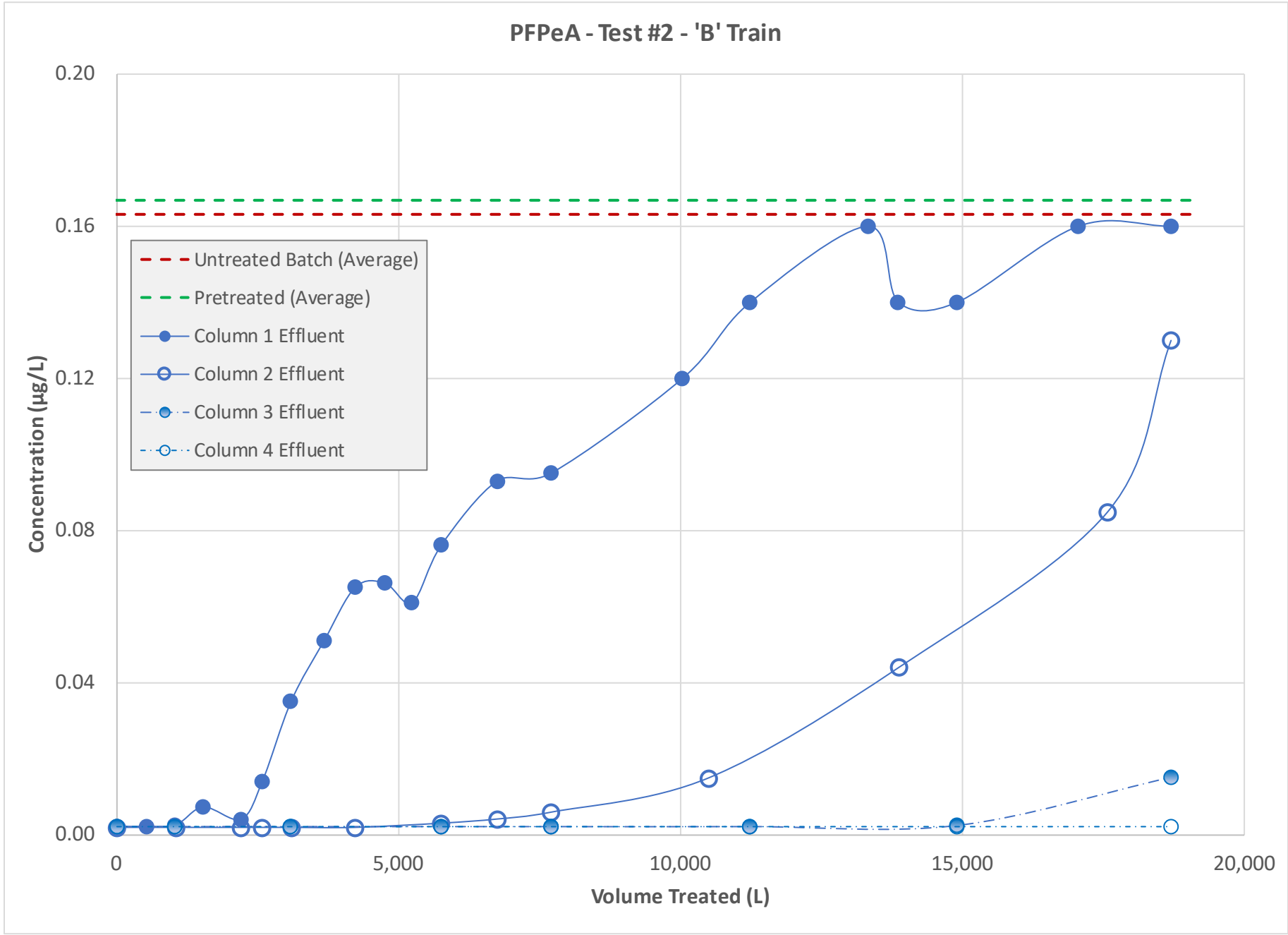

PEPA - Test #2 - 'A' Train
Previously Presented
Untreated Batch
Untreated Batch (Average)
Pretreated
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent
Concentration (µg/L)
1.6
1.2
0.8
0.4
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)


PEPA - Test #2 - 'B' Train
Untreated Batch (Average)
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent
Column 3 Effluent
Column 4 Effluent
Previously Presented
Concentration (µg/L)
1.6
1.2
0.8
0.4
0.0
0
4,000
8,000
12,000
16,000
20,000
Volume Treated (L)


PFBA - Test #2 - 'A' Train
0.20
0.16
0.12
0.08
0.04
0.00
Concentration (µg/L)
0
5,000
10,000
15,000
20,000
Volume Treated (L)
Untreated Batch
Untreated Batch (Average)
Pretreated
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent


PFBA - Test #2 - 'B' Train
Untreated Batch (Average)
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent
Column 3 Effluent
Column 4 Effluent
Concentration (µg/L)
0.20
0.16
0.12
0.08
0.04
0.00
0
5,000
10,000
15,000
20,000
Volume Treated (L)


PFPeA - Test #2 - 'A' Train
0.20
0.16
0.12
0.08
0.04
0.00
Concentration (µg/L)
0
5,000
10,000
15,000
20,000
Volume Treated (L)
Untreated Batch
Untreated Batch (Average)
Pretreated
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent


PFPeA - Test #2 - 'B' Train
0.20
0.16
0.12
0.08
0.04
0.00
Concentration (µg/L)
0
5,000
10,000
15,000
20,000
Volume Treated (L)
Untreated Batch (Average)
Pretreated (Average)
Column 1 Effluent
Column 2 Effluent
Column 3 Effluent
Column 4 Effluent