ICR TREATMENT STUDY ANALYSIS

Base Analysis and Data Review Comments

Treatment Study ID 3003

Study Protocol Bench-Scale RSSCT treatment study

Plant ICR Number 731

PWS Name Miami

City, State, Zip Jackson, MS 39205

These are general comments that do not need to be responded to directly.

Major comments:

1. Influent water batch for all quarters of this bench-scale study was sampled and batch treated daily based on daily plant chemical doses. GAC influent sampling was not expanded to account for potential variability in GAC influent water quality.

2. Quarter 2: Due to "air binding", the 10 minute EBCT column was operated at a flow rate 35% of the design flow rate throughout the second two-thirds of the run. The run was 28 percent complete, based on operation time, when the change occurred. The full-scale equivalent EBCT during the latter 72 percent of the run was estimated as 83 minutes.

General Comments:

1. Report indicates "problems were encountered in maintaining a constant flow rate, especially when the two different EBCT tests were conducted in parallel."

2. Due to many BMRL values and variability in data, most TOC breakthrough curves are not "typical," i.e., effluent concentrations increasing over time.

Outlier Comments:

This study will not undergo any curve fits.

31 outliers removed.

City of Jackson | **Bench-Scale RSSCT Treatment Study Summary** | **Quarter:** 1

ICR Information

ID / ICR#: MS0250008 / 731
ICR Contact: Mr. Donald Bach
Phone No.: (601)960-1007
Period: 4/20/98 - 8/28/98 (130 B-S days)

Design Information

Design TOC:	3.2 mg/L	**Full-Scale GAC Size:**	12x40 Bituminous coa
Col Diameter:	11.0 mm	**Bench-Scale GAC Size:**	100x200
Min Reynolds#:	0.48	**Scaling Factor:**	9.36
Full-Scale Temp:	18.9 C	**Meas Dry Bed Density:**	0.50 g/cm3

Water Quality Summary

	10 Min Influent				20 Min Influent			
Influent	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max
TOC	3.7	**1.2**	4	2.8 - 5.4	3.1	0.5	3	2.7 - 3.6
pH	6.8	0.7	4	6.1 - 7.8	6.7	0.5	3	6.2 - 7.2
UV254	0.061	0.009	3	0.054 - 0.071	0.052	0.004	3	0.048 - 0.057
SUVA	1.95	0.12	3	1.81 - 2.05	1.68	0.18	3	1.57 - 1.89
Bromide	10	0	2	10 - 10	30	1	2	29 - 30
SDS-TOX	365	**340**	2	195 - 535	318	**165**	3	160 - 490
SDS-THM4	26	**28**	3	0 - 56	55	**14**	3	47 - 71
SDS-HAA6	41	**45**	3	0 - 89	68	**28**	3	52 - 100
Effluent	**10 Min EBCT**			(67 B-S days)	**20 Min EBCT**			(58 B-S days)
Effluent pH	7.3	0.6	16	6.7 - 8.6	7.1	0.7	11	6.1 - 8.9
Effluent Temp	20.4	3.5	16	14.6 - 27.2	22.0	1.5	11	20.1 - 25.2

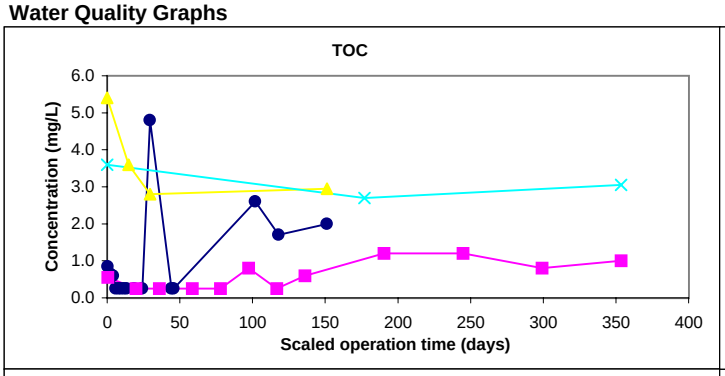
Cumulative SDS Conditions

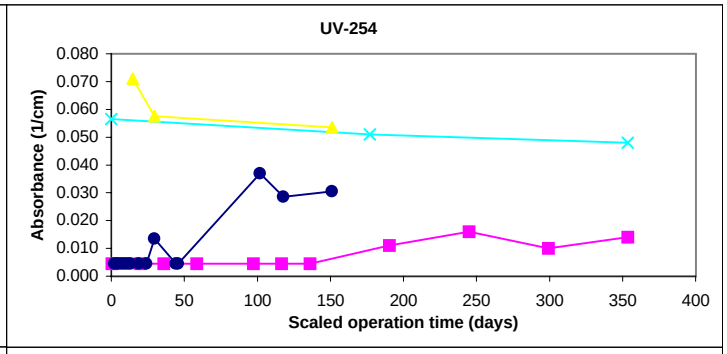
	Mean	SD	Count	Min/Max
Res (0)	1.06	0.75	25	0.10 - 2.70
Temp	22.0	1.9	25	16.8 - 24.9
pH	6.4	0.4	25	5.7 - 7.3
Time	24.0	0.0	35	24.0 - 24.0

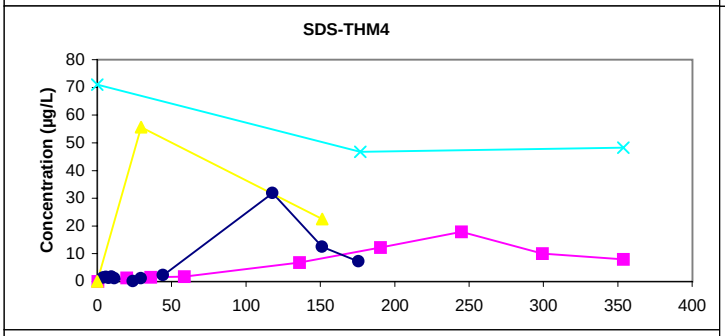
Comments:

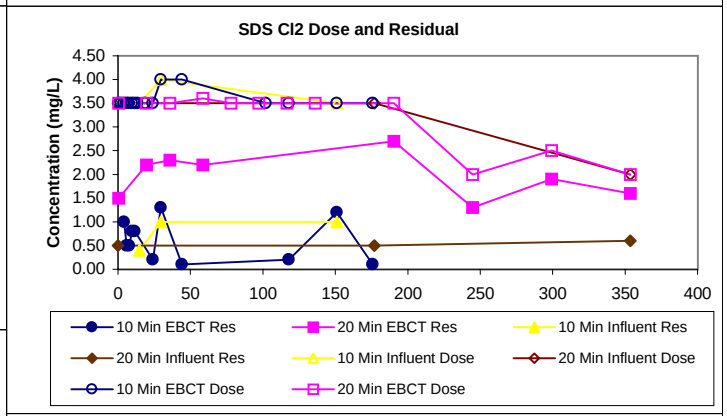
Chart Legend: 10 Min EBCT; 20 Min EBCT; 10 Min Influent; 20 Min Influent

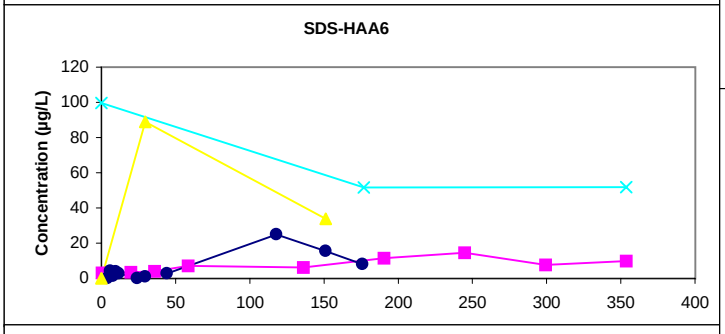
Water Quality Graphs

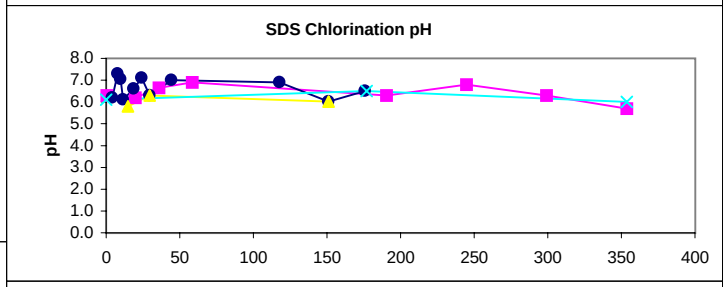


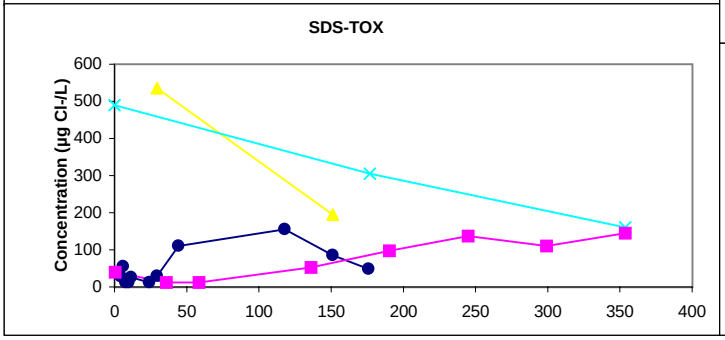


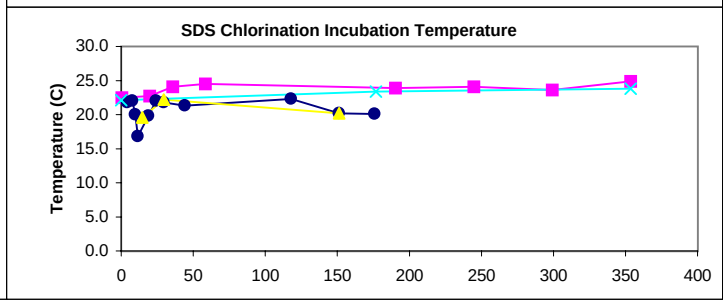




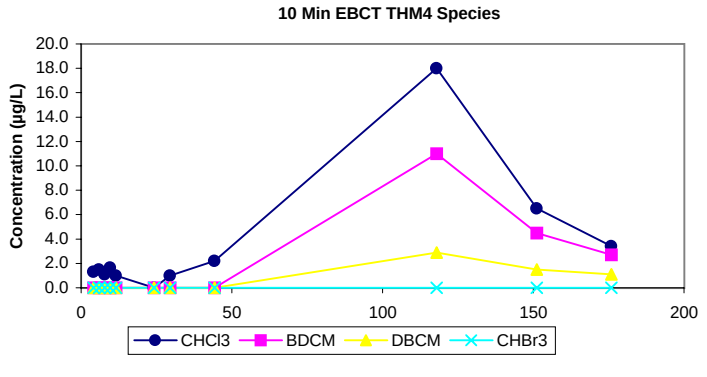


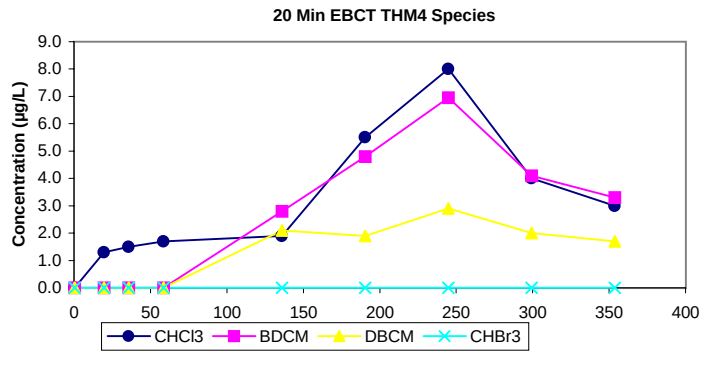


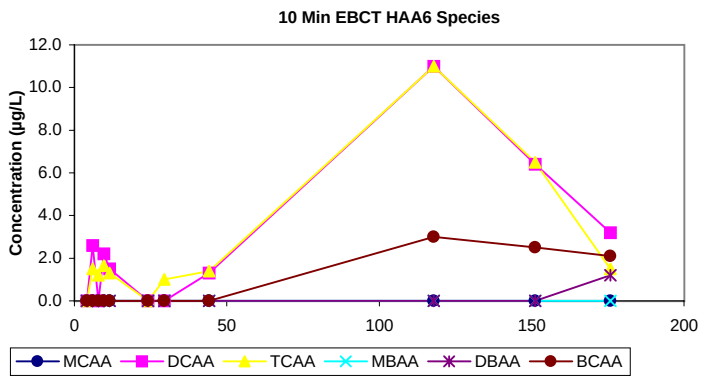


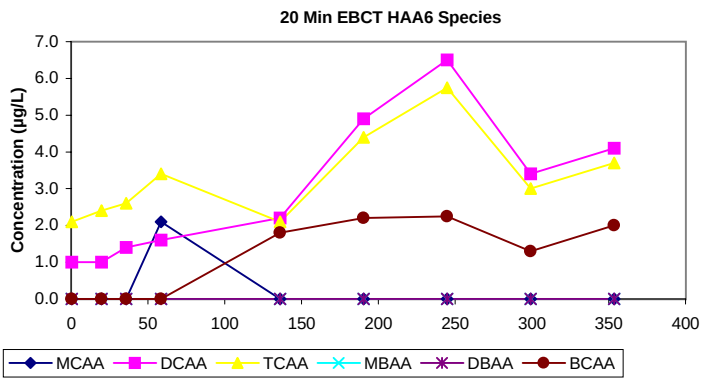


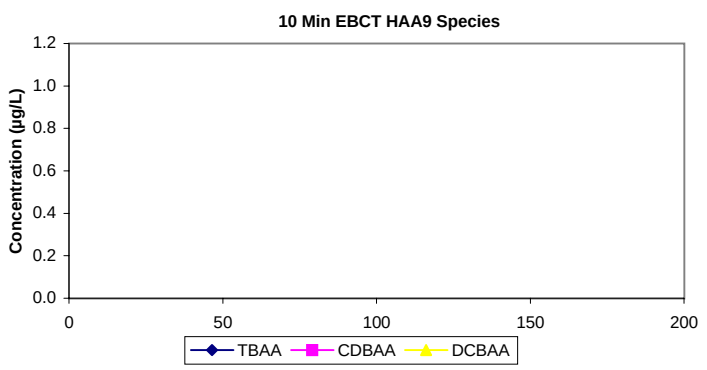
Water Quality Graphs (Continued)

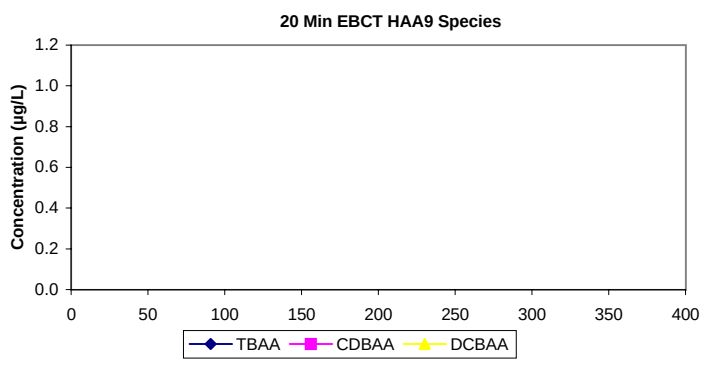


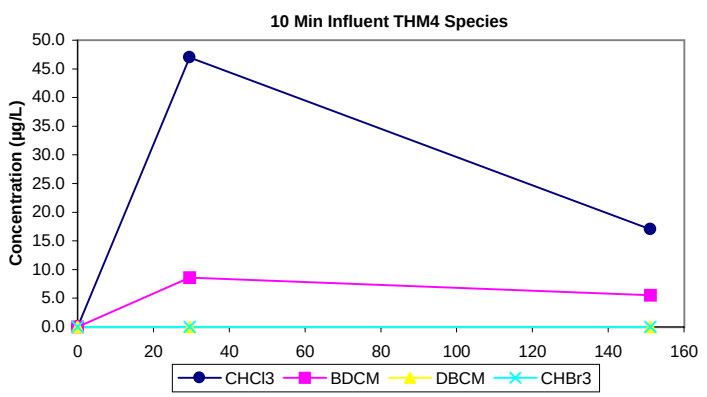


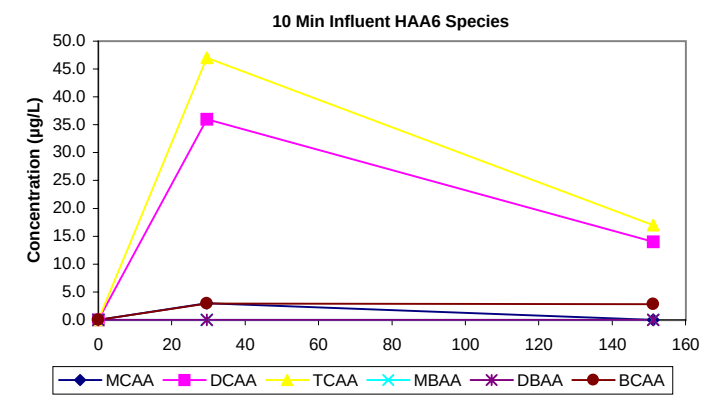












City of Jackson | **Bench-Scale RSSCT Treatment Study Summary** | **Quarter:** 2

ICR Information

ID / ICR#: MS0250008 / 731
ICR Contact: Mr. Donald Bach
Phone No.: (601)960-1007
Period: 9/9/98 - 12/28/98 (110 B-S days)

Design Information

Design TOC:	3.4 mg/L	**Full-Scale GAC Size:**	12x40 Bituminous coa
Col Diameter:	11.0 mm	**Bench-Scale GAC Size:**	100x200
Min Reynolds#:	0.56	**Scaling Factor:**	9.36
Full-Scale Temp:	25.8 C	**Meas Dry Bed Density:**	0.50 g/cm3

Water Quality Summary

	10 Min Influent				20 Min Influent			
Influent	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max
TOC	2.8	0.2	2	2.7 - 2.9	3.1	0.6	4	2.4 - 3.7
pH	6.4	0.2	3	6.2 - 6.5	6.1	0.6	4	5.2 - 6.6
UV254	0.036	**0.020**	2	0.026 - 0.046	0.052	**0.011**	4	0.040 - 0.066
SUVA	1.30	**0.81**	2	0.90 - 1.70	1.66	0.22	4	1.35 - 1.87
Bromide	32	1	2	32 - 32	30	1	2	29 - 30
SDS-TOX	155	**85**	3	61 - 225	134	**119**	3	13 - 250
SDS-THM4	28	**19**	3	6 - 41	20	**24**	3	0 - 46
SDS-HAA6	38	2	2	37 - 39	27	**28**	3	0 - 55
Effluent	**10 Min EBCT**			(47 B-S days)	**20 Min EBCT**			(90 B-S days)
Effluent pH	6.7	0.9	13	6.0 - 9.7	6.3	0.3	13	5.9 - 6.8
Effluent Temp	21.5	1.6	13	19.5 - 24.9	20.9	1.2	13	19.3 - 23.4

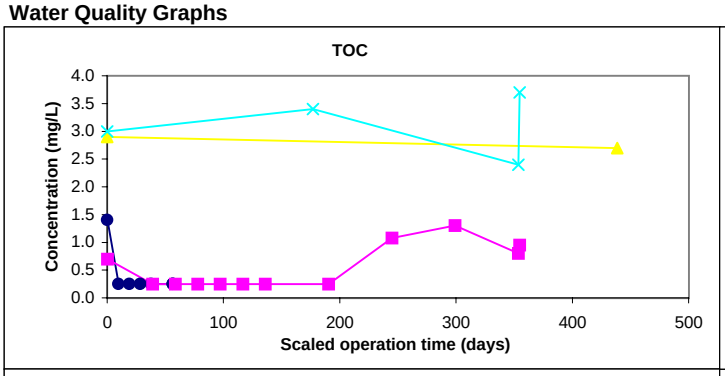
Cumulative SDS Conditions

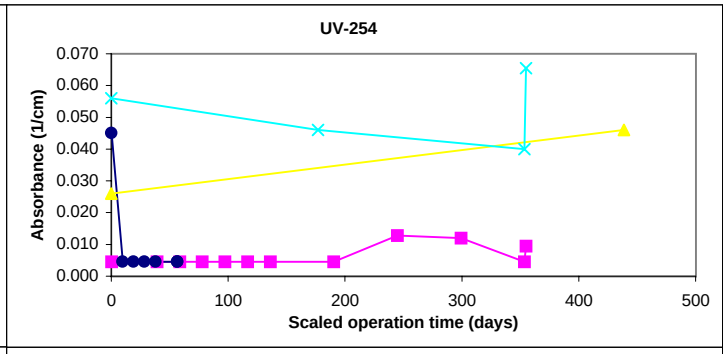
	Mean	SD	Count	Min/Max
Res (0)	1.11	0.58	25	0.10 - 2.00
Temp	21.7	1.4	27	19.9 - 25.5
pH	6.5	0.7	27	5.9 - 8.9
Time	24.0	0.0	27	24.0 - 24.0

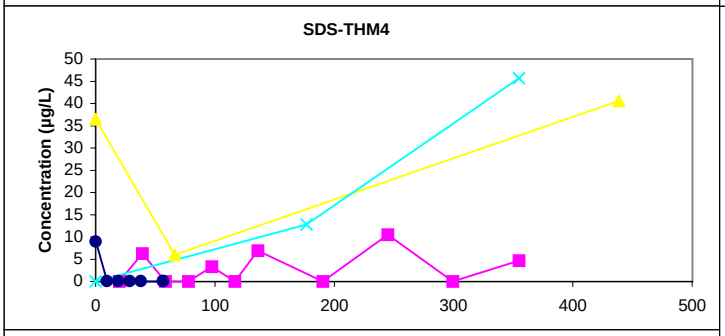
Comments:

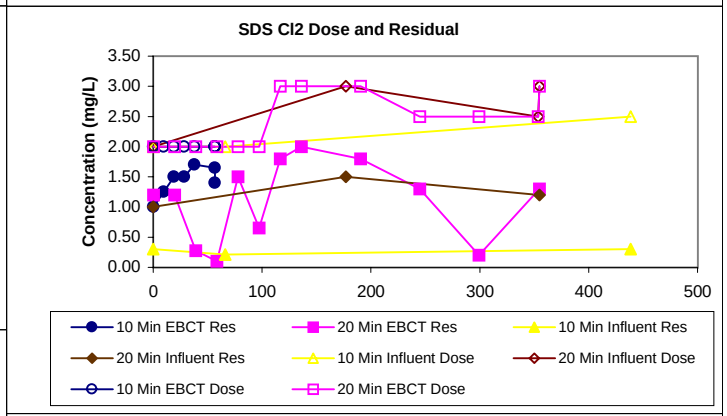
Chart Legend: 10 Min EBCT; 20 Min EBCT; 10 Min Influent; 20 Min Influent

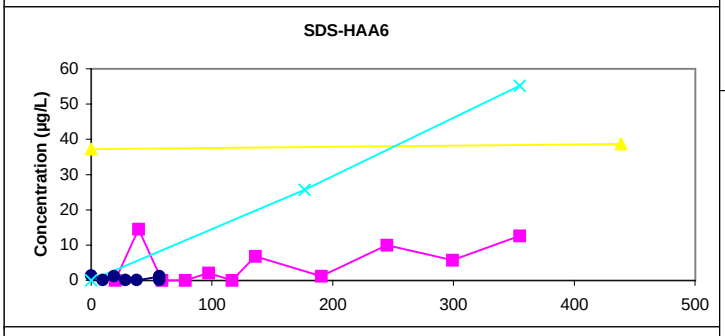
Water Quality Graphs

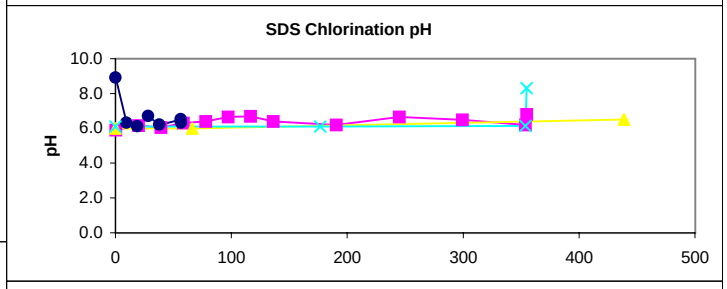


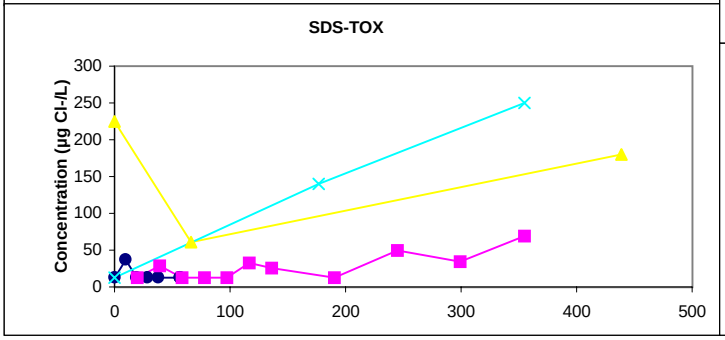


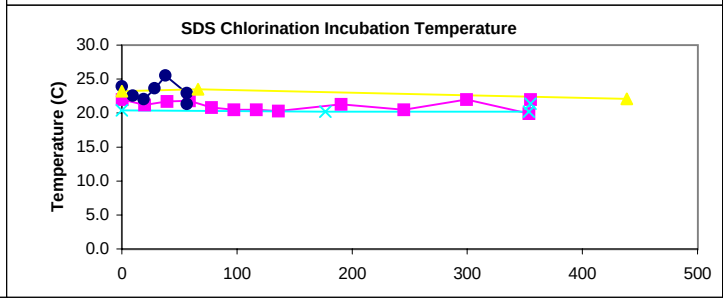




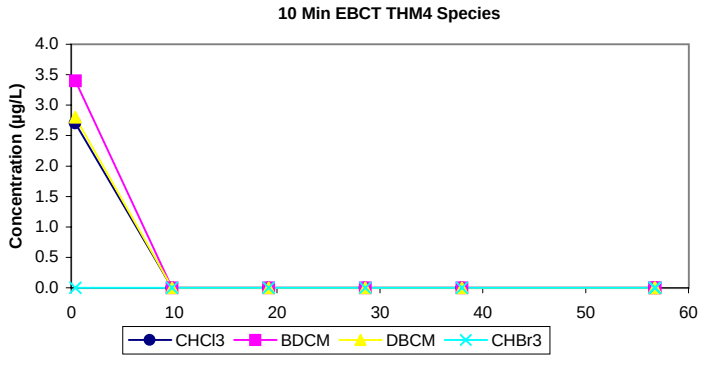


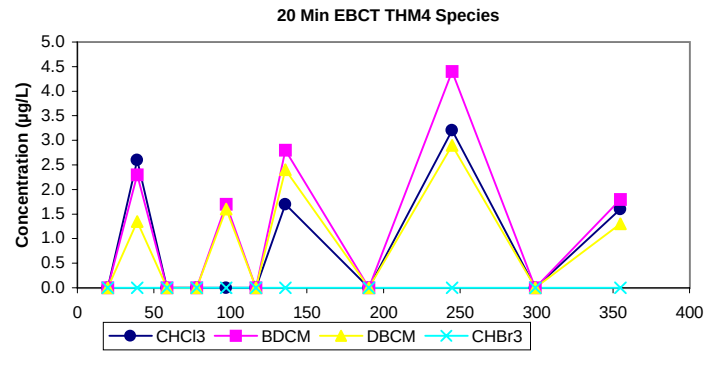


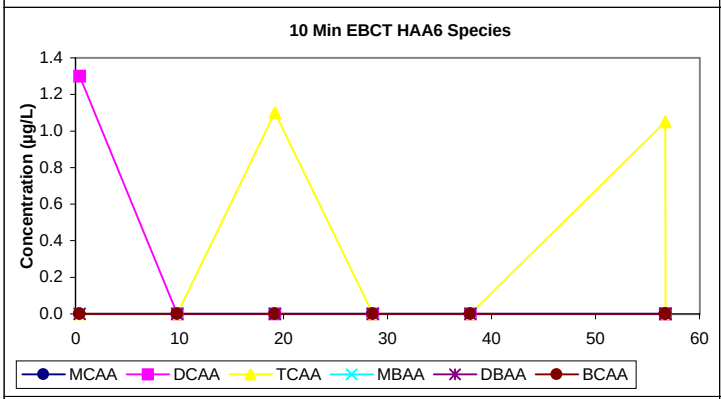


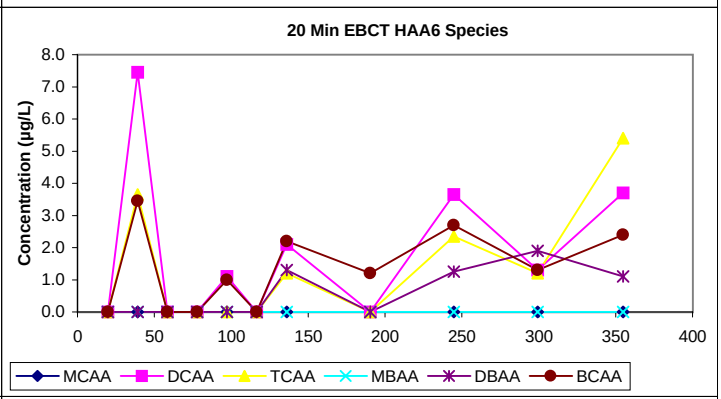


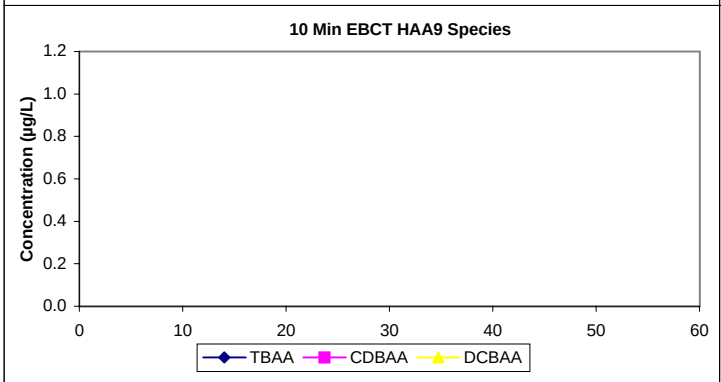
Water Quality Graphs (Continued)

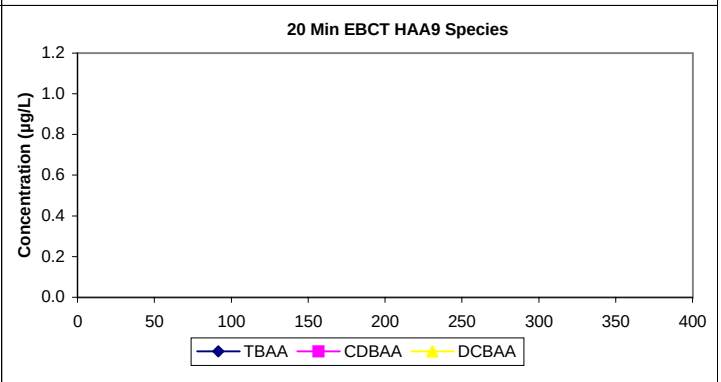


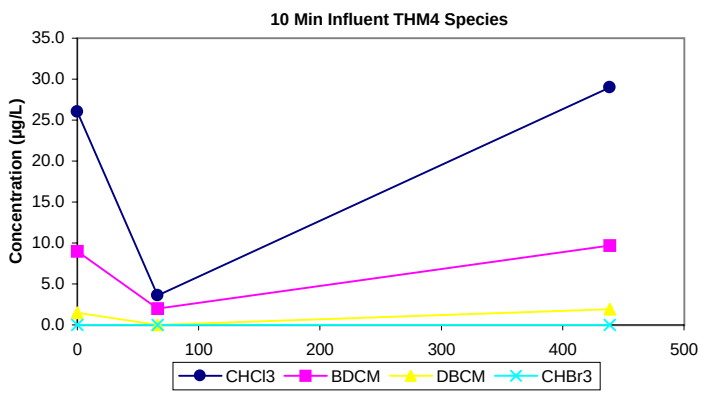


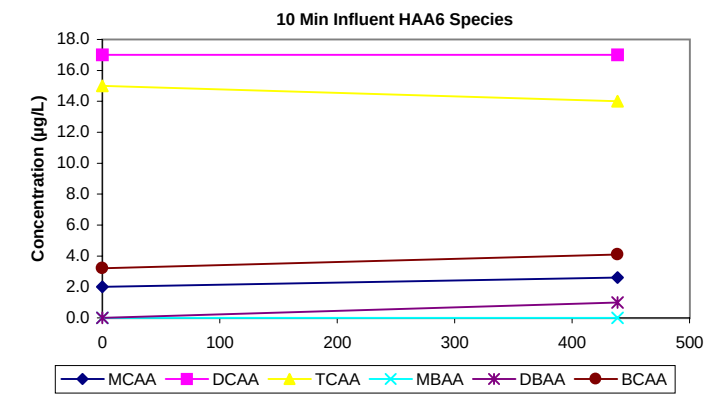












City of Jackson | **Bench-Scale RSSCT Treatment Study Summary** | **Quarter:** 3

ICR Information

ID / ICR#:	MS0250008 / 731
ICR Contact:	Mr. Donald Bach
Phone No.:	(601)960-1007
Period:	12/28/98 - 3/4/99 (66 B-S days)

Design Information

Design TOC:	3.2 mg/L	**Full-Scale GAC Size:**	12x40 Bituminous coa
Col Diameter:	11.0 mm	**Bench-Scale GAC Size:**	100x200
Min Reynolds#:	0.48	**Scaling Factor:**	9.36
Full-Scale Temp:	19.5 C	**Meas Dry Bed Density:**	0.50 g/cm3

Water Quality Summary

	10 Min Influent				20 Min Influent			
Influent	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max
TOC	3.7	0.3	3	3.5 - 4.1	3.5	0.5	3	3.1 - 4.1
pH	6.5	0.1	3	6.5 - 6.6	6.4	0.2	3	6.2 - 6.6
UV254	0.072	**0.027**	3	0.054 - 0.103	0.075	**0.024**	3	0.060 - 0.103
SUVA	1.90	**0.53**	3	1.52 - 2.50	2.09	0.38	3	1.76 - 2.50
Bromide	22	**24**	2	10 - 34	22	**23**	2	10 - 33
SDS-TOX	230	**51**	3	185 - 285	203	35	2	185 - 220
SDS-THM4	50	**23**	3	37 - 76	43	**11**	2	38 - 48
SDS-HAA6	53	**21**	3	32 - 74	44	**23**	2	32 - 55
Effluent	**10 Min EBCT**			(59 B-S days)	**20 Min EBCT**			(50 B-S days)
Effluent pH	6.6	0.2	12	6.3 - 7.2	6.6	0.1	12	6.5 - 6.8
Effluent Temp	24.5	1.2	12	21.3 - 25.6	24.0	1.1	12	22.3 - 25.3

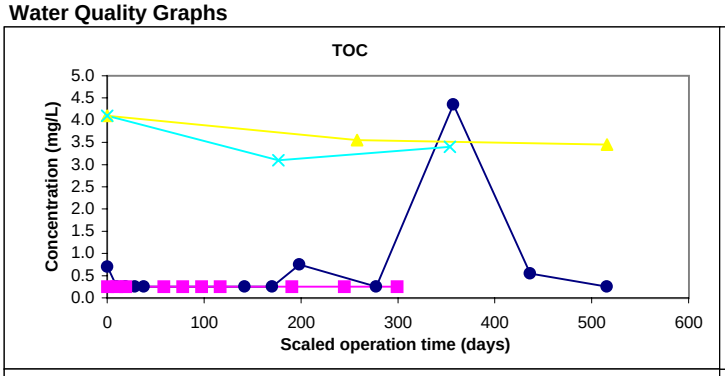
Cumulative SDS Conditions

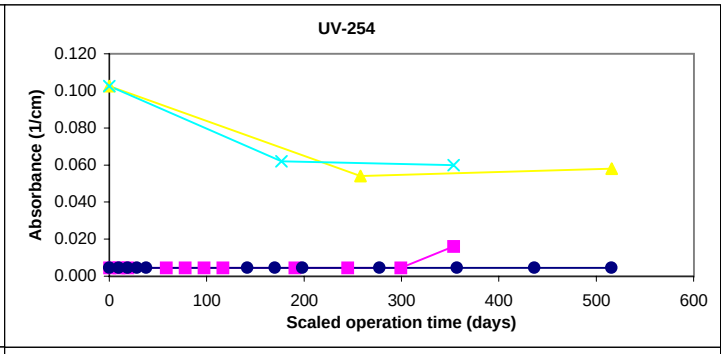
	Mean	SD	Count	Min/Max
Res (0)	1.18	0.41	30	0.10 - 2.10
Temp	23.3	1.5	30	20.0 - 26.3
pH	8.3	0.6	30	6.6 - 8.9
Time	24.0	0.0	30	24.0 - 24.0

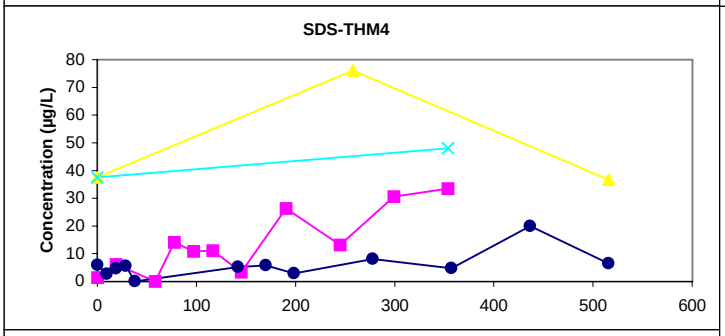
Comments:

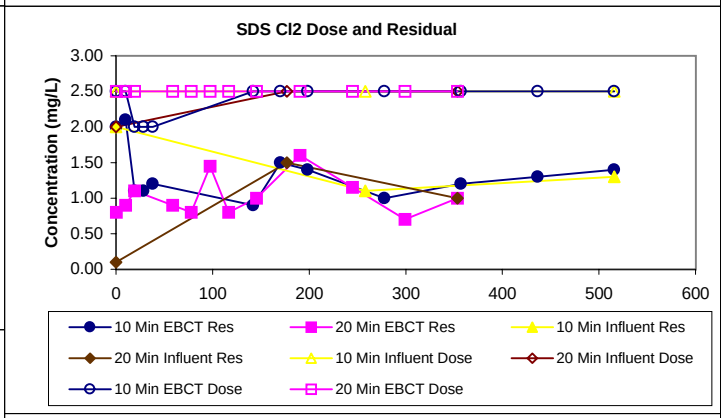
Chart Legend: 10 Min EBCT; 20 Min EBCT; 10 Min Influent; 20 Min Influent

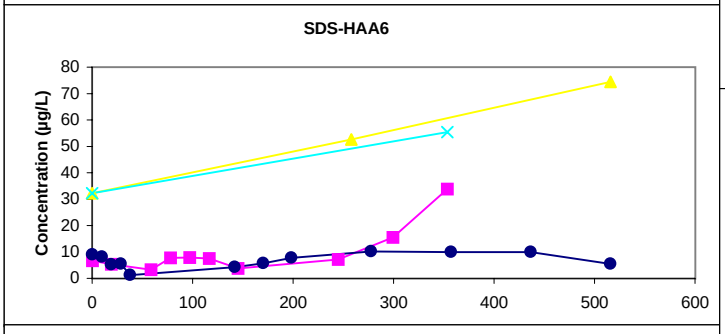
Water Quality Graphs

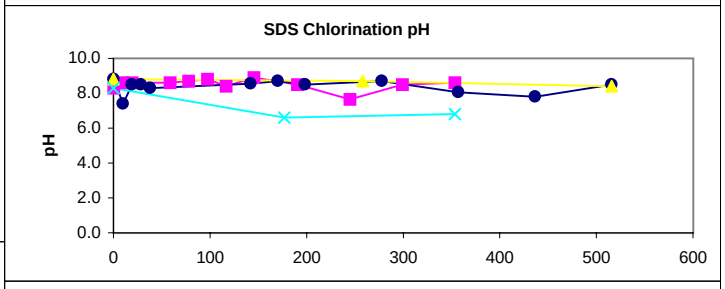


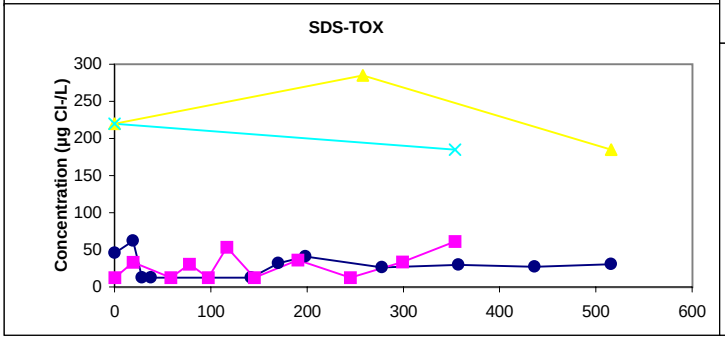


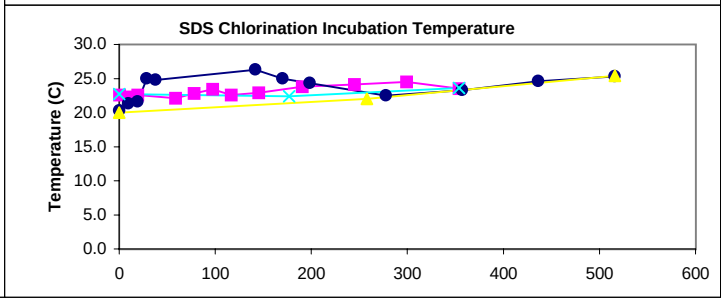












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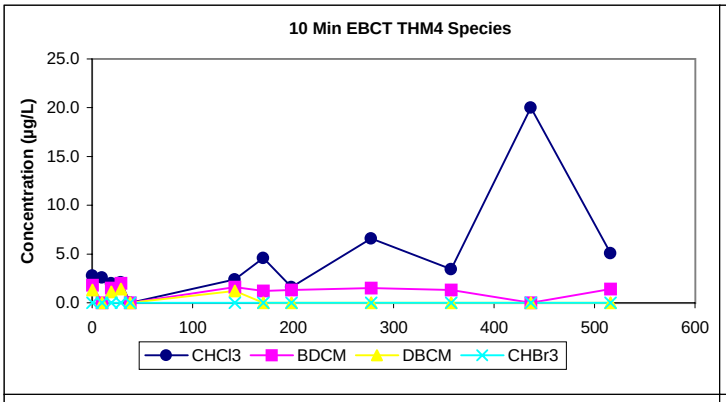
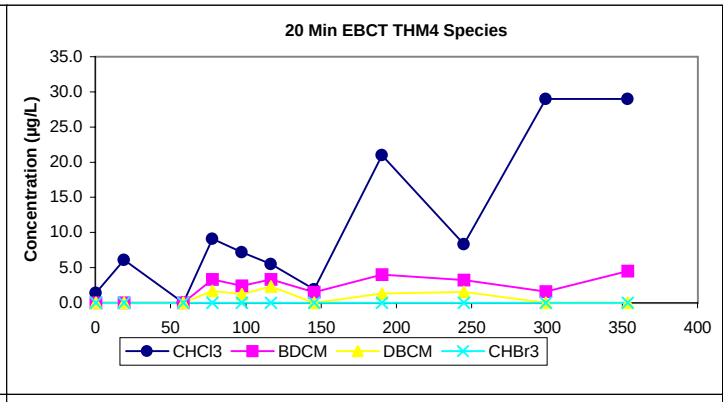
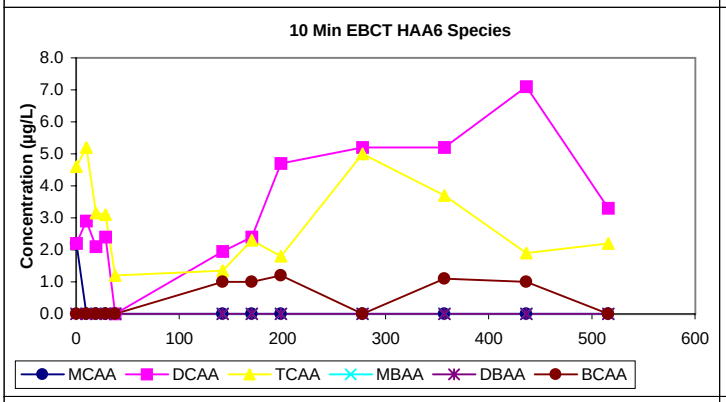
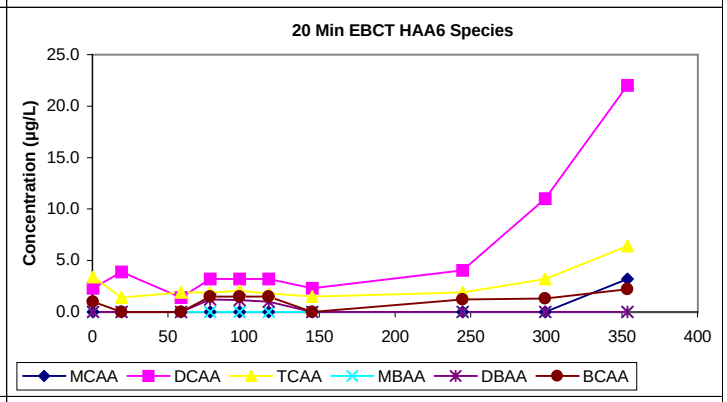
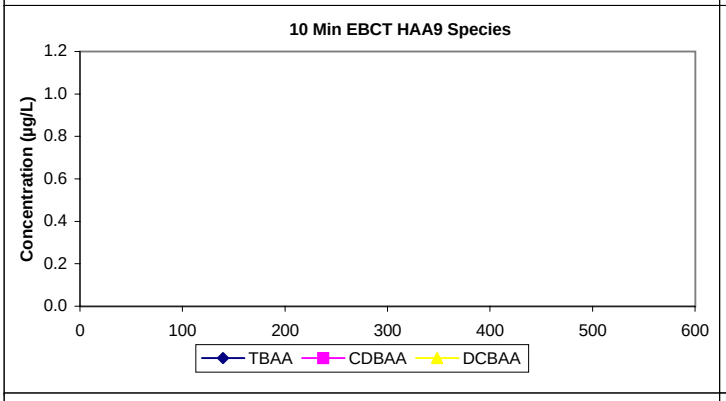
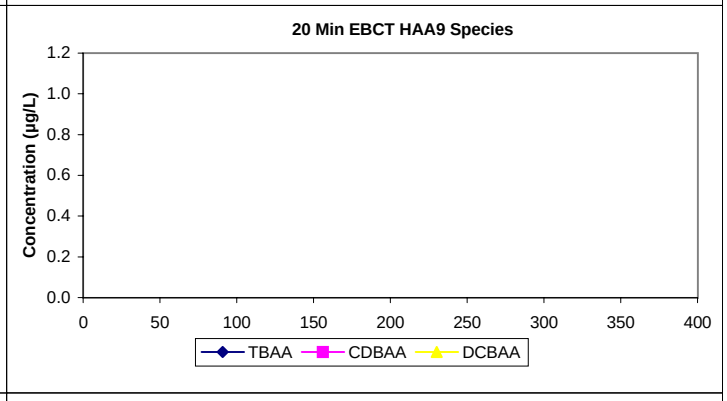


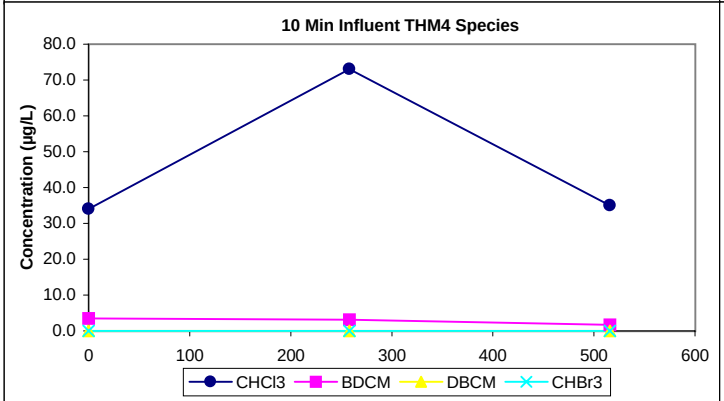


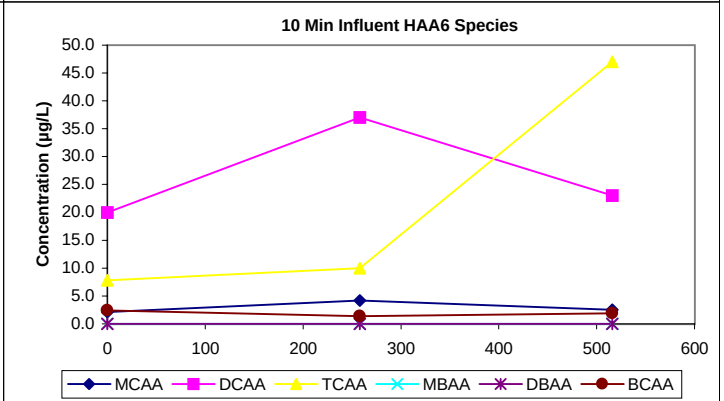












City of Jackson | **Bench-Scale RSSCT Treatment Study Summary** | **Quarter:** 4

ICR Information

ID / ICR#: MS0250008 / 731
ICR Contact: Mr. Donald Bach
Phone No.: (601)960-1007
Period: 3/4/99 - 6/7/99 (95 B-S days)

Design Information

Design TOC: 3.3 mg/L
Col Diameter: 11.0 mm
Min Reynolds#: 0.51
Full-Scale Temp: 21.4 C
Full-Scale GAC Size: 12x40 Bituminous coa
Bench-Scale GAC Size: 100x200
Scaling Factor: 9.36
Meas Dry Bed Density: 0.50 g/cm3

Water Quality Summary

	10 Min Influent				20 Min Influent			
Influent	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max
TOC	3.5	0.4	3	3.3 - 4.0	3.8	**0.8**	3	2.9 - 4.4
pH	6.6	0.3	3	6.3 - 6.8	7.0	0.3	3	6.8 - 7.3
UV254	0.072	0.010	3	0.061 - 0.081	0.059	**0.014**	3	0.044 - 0.070
SUVA	2.07	0.35	3	1.85 - 2.48	1.54	0.11	3	1.45 - 1.67
Bromide	10	0	2	10 - 10	10	0	2	10 - 10
SDS-TOX	248	**215**	2	140 - 355	263	**65**	2	230 - 295
SDS-THM4	95	**141**	2	24 - 165	43	**33**	3	7 - 72
SDS-HAA6	40	0	1	40 - 40	61	0	1	61 - 61
Effluent	**10 Min EBCT**			(50 B-S days)	**20 Min EBCT**			(76 B-S days)
Effluent pH	6.6	0.3	12	6.0 - 6.8	6.9	0.2	12	6.8 - 7.3
Effluent Temp	22.3	NA	1	22.3 - 22.3	22.9	0.2	5	22.7 - 23.1

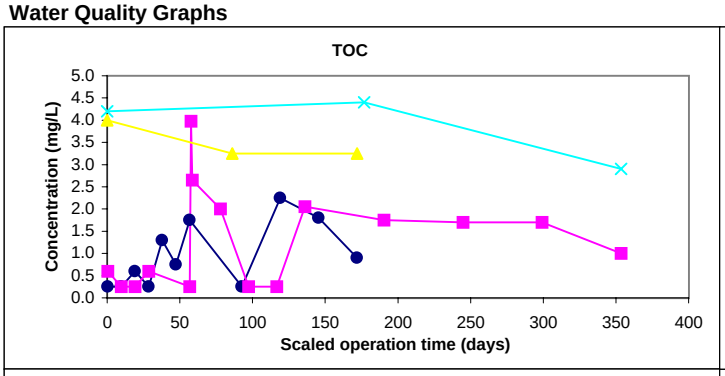
Cumulative SDS Conditions

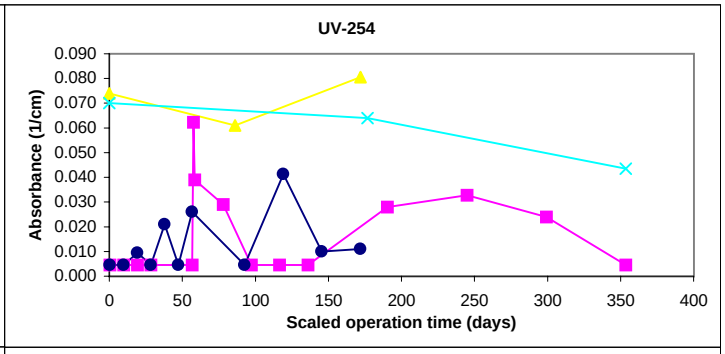
	Mean	SD	Count	Min/Max
Res (0)	0.98	0.35	28	0.20 - 1.50
Temp	23.2	0.7	7	22.4 - 24.1
pH	8.5	0.3	21	7.3 - 8.8
Time	24.0	0.0	31	24.0 - 24.0

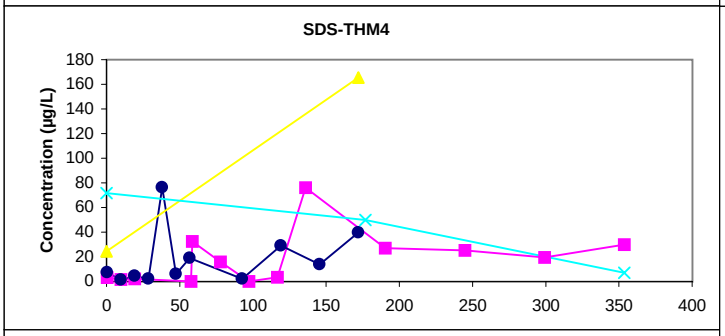
Comments:

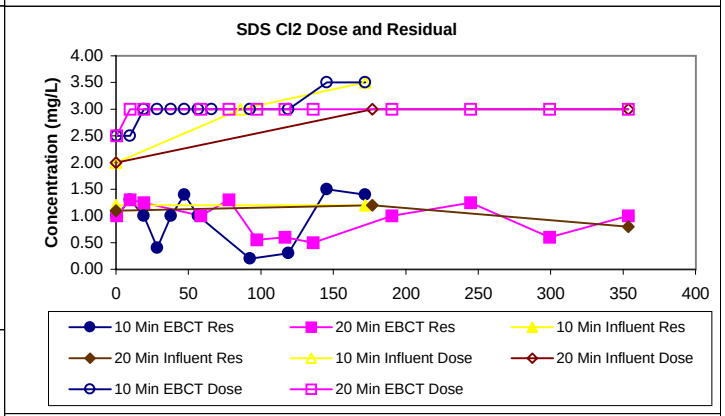
Chart Legend: 10 Min EBCT; 20 Min EBCT; 10 Min Influent; 20 Min Influent

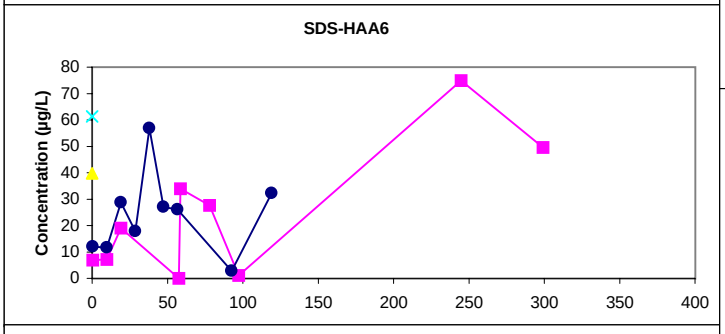
Water Quality Graphs

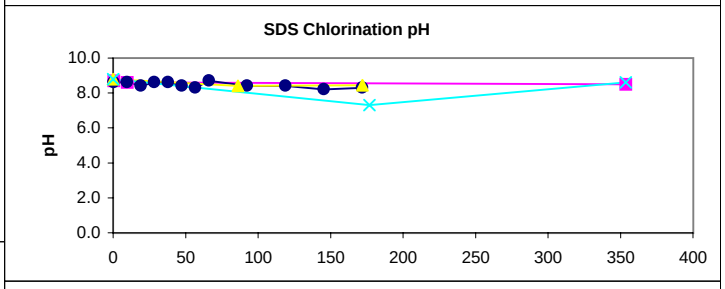


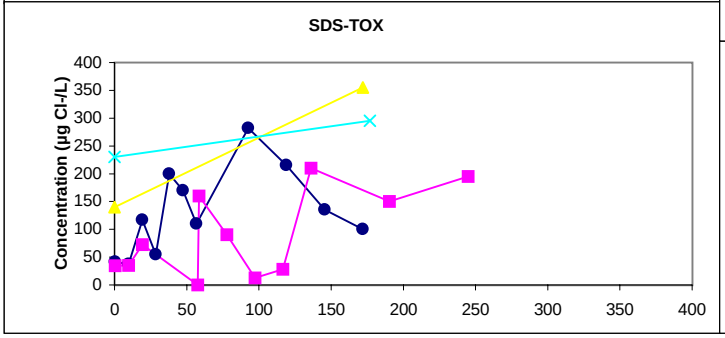


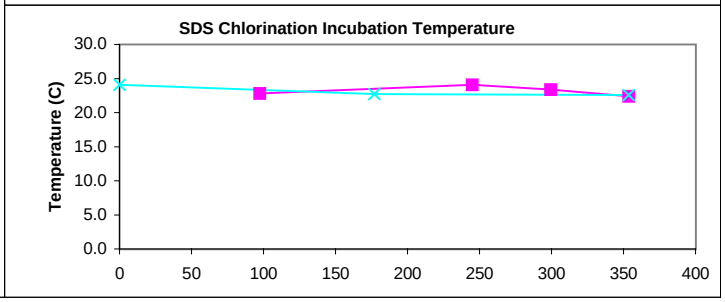












Water Quality Graphs (Continued)