

ICR TREATMENT STUDY ANALYSIS

Base Analysis and Data Review Comments

Treatment Study ID	1043
Study Protocol	GAC RSSCT treatment study
Plant ICR Number	411
PWS Name	Ann Arbor
City, State, Zip	Ann Arbor, MI 48103

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

Major comments:

1. RSSCT schematic (Figure 3-2) shows influent sampling point located prior to inline filtration by 0.1-0.2 μm Teflon filter. Therefore, GAC influent water quality analysis was not conducted on filtered water.
2. Quarter 4: Breakthrough profile of SDS-DCAA (rapid breakthrough to influent concentration, then decrease over the remainder of the run for both EBCTs) indicates possible presence of formed DCAA in RSSCT influent water sample, although levels were fairly low, $< 6 \mu\text{g/L}$.

General Comments:

1. GAC influent was filtered through 0.1-0.2 μm pore size filter, a tighter filter than that required by the *Treatment Studies Manual* (about 1.0 μm).
2. Average GAC influent turbidity ranged from 0.1 to 1.7 ntu during all four sessions. Note that based on Figure 3-1, sampling was conducted on settled water, instead of filtered water, and relatively high (and somewhat variable) turbidity measurements would be expected.
3. Constant temperature of 20°C reported for influent B samples during all 4 quarters.
4. Table 2-2 units for bromide should be mg/L; values for SUVA are off by a factor of 100.

Outlier Data:

Two outliers removed.

Cell: A1

Comment: 1043-SAS.xls 2/3/00 11:08

All curve fits reviewed and approved. See below for log of refit datasets.

Cell: C5

Comment: 1043-10-01 - Run 1 (CHBr3) 2/3/00 10:24
Original value (CoefA0) = 0.0028 New value = 1.3989
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: D5

Comment: 1043-10-01 - Run 1 (CHBr3) 2/3/00 10:24
Original value (CoefAf) = 6.4928 New value = 5.5213
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: E5

Comment: 1043-10-01 - Run 1 (CHBr3) 2/3/00 10:24
Original value (CoefB) = 9.2698 New value = 65.4917
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: F5

Comment: 1043-10-01 - Run 1 (CHBr3) 2/3/00 10:24
Original value (CoefD) = 0.1552 New value = 0.58
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: J5

Comment: 1043-10-01 - Run 1 (CHBr3) 2/3/00 10:24
Original value (S) = -0.0085 New value = -0.043
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: C27

Comment: 1043-10-02 - Run 3 (CHBr3) 2/3/00 10:42
Original value (CoefA0) = -5.532 New value = 2.3033
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: D27

Comment: 1043-10-02 - Run 3 (CHBr3) 2/3/00 10:42
Original value (CoefAf) = 16.596 New value = 7.124
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: E27

Comment: 1043-10-02 - Run 3 (CHBr3) 2/3/00 10:42
Original value (CoefB) = 0.404 New value = 14.2154
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: F27

Comment: 1043-10-02 - Run 3 (CHBr3) 2/3/00 10:42
Original value (CoefD) = 0.0114 New value = 0.5704
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: J27

Comment: 1043-10-02 - Run 3 (CHBr3) 2/3/00 10:42
Original value (S) = 0 New value = -0.0338
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: C76

Comment: 1043-10-04 - Run 7 (DCAA) 2/3/00 10:45
Original value (CoefA0) = 0.047 New value = -0.5958
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: D76

Comment: 1043-10-04 - Run 7 (DCAA) 2/3/00 10:45
Original value (CoefAf) = 3.6606 New value = 5.9417
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: E76

Comment: 1043-10-04 - Run 7 (DCAA) 2/3/00 10:45
Original value (CoefB) = 23.5826 New value = 32.4587
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: F76

Comment: 1043-10-04 - Run 7 (DCAA) 2/3/00 10:45
Original value (CoefD) = 0.1438 New value = 0.1654
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: J76

Comment: 1043-10-04 - Run 7 (DCAA) 2/3/00 10:45
Original value (S) = -0.0119 New value = -0.0328
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: C90

Comment: 1043-20-01 - Run 2 (BCAA) 2/3/00 10:27
Original value (CoefA0) = 0 New value = -0.2517
Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: D90

Comment: 1043-20-01 - Run 2 (BCAA) 2/3/00 10:27
Original value (CoefAf) = 0 New value = 3.9568
Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: E90

Comment: 1043-20-01 - Run 2 (BCAA) 2/3/00 10:27
Original value (CoefB) = 0 New value = 136.1875
Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: F90

Comment: 1043-20-01 - Run 2 (BCAA) 2/3/00 10:27
Original value (CoefD) = 0 New value = 0.0583
Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: J90

Comment: 1043-20-01 - Run 2 (BCAA) 2/3/00 10:27

Original value (S) = 0 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: C98

Comment: 1043-20-01 - Run 2 (DCAA) 2/1/00 20:46

Original value (CoefA0) = 0 New value = 1.0411

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

1043-20-01 - Run 2 (DCAA) 2/3/00 10:26

Original value (CoefA0) = 1.0411 New value = -0.3086

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: D98

Comment: 1043-20-01 - Run 2 (DCAA) 2/1/00 20:46

Original value (CoefAf) = 0 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

1043-20-01 - Run 2 (DCAA) 2/3/00 10:26

Original value (CoefAf) = 0 New value = 4.7983

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: E98

Comment: 1043-20-01 - Run 2 (DCAA) 2/1/00 20:46

Original value (CoefB) = 0 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

1043-20-01 - Run 2 (DCAA) 2/3/00 10:26

Original value (CoefB) = 0 New value = 79.411

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: F98

Comment: 1043-20-01 - Run 2 (DCAA) 2/1/00 20:46

Original value (CoefD) = 0 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

1043-20-01 - Run 2 (DCAA) 2/3/00 10:26

Original value (CoefD) = 0 New value = 0.0487

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: J98

Comment: 1043-20-01 - Run 2 (DCAA) 2/1/00 20:46

Original value (S) = 0 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

1043-20-01 - Run 2 (DCAA) 2/3/00 10:26

Original value (S) = 0 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: K98

Comment: 1043-20-01 - Run 2 (DCAA) 2/1/00 20:46

Original value (t_0) = 0 New value = 88.8609

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

Cell: C100

Comment: 1043-20-01 - Run 2 (HAA5) 2/3/00 10:29

Original value (CoefA0) = 99999 New value = -0.4751

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: D100

Comment: 1043-20-01 - Run 2 (HAA5) 2/3/00 10:29

Original value (CoefAf) = 99999 New value = 8.0416

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: E100

Comment: 1043-20-01 - Run 2 (HAA5) 2/3/00 10:29

Original value (CoefB) = 99999 New value = 19.9616

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: F100

Comment: 1043-20-01 - Run 2 (HAA5) 2/3/00 10:29

Original value (CoefD) = 99999 New value = 0.0502

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: G100

Comment: 1043-20-01 - Run 2 (HAA5) 2/3/00 10:29

Original value (t_{lb}) = 99999 New value = 0.97

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: H100

Comment: 1043-20-01 - Run 2 (HAA5) 2/3/00 10:29

Original value (t_{ub}) = 99999 New value = 213.25

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: J100

Comment: 1043-20-01 - Run 2 (HAA5) 2/3/00 10:29

Original value (S) = 0 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: C101

Comment: 1043-20-01 - Run 2 (HAA6) 2/3/00 10:35

Original value (CoefA0) = 99999 New value = -0.9328

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: D101

Comment: 1043-20-01 - Run 2 (HAA6) 2/3/00 10:35

Original value (CoefAf) = 99999 New value = 12.2162

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: E101

Comment: 1043-20-01 - Run 2 (HAA6) 2/3/00 10:35

Original value (CoefB) = 99999 New value = 14.7308

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: F101

Comment: 1043-20-01 - Run 2 (HAA6) 2/3/00 10:35

Original value (CoefD) = 99999 New value = 0.0459

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: G101

Comment: 1043-20-01 - Run 2 (HAA6) 2/3/00 10:35

Original value (t_lb) = 99999 New value = 0.97

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: H101

Comment: 1043-20-01 - Run 2 (HAA6) 2/3/00 10:35

Original value (t_ub) = 99999 New value = 213.25

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: J101

Comment: 1043-20-01 - Run 2 (HAA6) 2/3/00 10:35

Original value (S) = 0 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Logistic function (type 1) applied.

Cell: C104

Comment: 1043-20-01 - Run 2 (MCAA) 2/2/00 08:37

Original value (CoefA0) = 99999 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

Cell: D104

Comment: 1043-20-01 - Run 2 (MCAA) 2/2/00 08:37

Original value (CoefAf) = 99999 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

Cell: E104

Comment: 1043-20-01 - Run 2 (MCAA) 2/2/00 08:37

Original value (CoefB) = 99999 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

Cell: F104

Comment: 1043-20-01 - Run 2 (MCAA) 2/2/00 08:37

Original value (CoefD) = 99999 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

Cell: G104

Comment: 1043-20-01 - Run 2 (MCAA) 2/2/00 08:37

Original value (t_lb) = 99999 New value = 0.97

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

Cell: H104

Comment: 1043-20-01 - Run 2 (MCAA) 2/2/00 08:37

Original value (t_ub) = 99999 New value = 213.25

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

Cell: J104

Comment: 1043-20-01 - Run 2 (MCAA) 2/2/00 08:37

Original value (S) = 0 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

Cell: K104

Comment: 1043-20-01 - Run 2 (MCAA) 2/2/00 08:37

Original value (t0) = 0 New value = 0

Fewer than 6 points above MRL, average above 1/2 MRL. Step function applied.

Cell: C115

Comment: 1043-20-02 - Run 4 (CHBr3) 2/3/00 10:44

Original value (CoefA0) = -7.01 New value = -8.405

Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: D115

Comment: 1043-20-02 - Run 4 (CHBr3) 2/3/00 10:44

Original value (CoefAf) = 21.03 New value = 21.7794

Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: E115

Comment: 1043-20-02 - Run 4 (CHBr3) 2/3/00 10:44

Original value (CoefB) = 0.7416 New value = 1.3407

Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: F115

Comment: 1043-20-02 - Run 4 (CHBr3) 2/3/00 10:44

Original value (CoefD) = 0.0327 New value = 0.104

Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: J115

Comment: 1043-20-02 - Run 4 (CHBr3) 2/3/00 10:44

Original value (S) = 0 New value = -0.0288

Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: G142

Comment: 1043-20-03 - Run 6 (DCAA) 2/2/00 08:52

Original value (t_lb) = 42.16 New value = 1.08

Value changed based on curve fit review.

Cell: G144

Comment: 1043-20-03 - Run 6 (HAA5) 2/2/00 08:52

Original value (t_lb) = 42.16 New value = 1.08

Value changed based on curve fit review.

Cell: G145

Comment: 1043-20-03 - Run 6 (HAA6) 2/2/00 08:52

Original value (t_lb) = 42.16 New value = 1.08

Value changed based on curve fit review.

Cell: C164

Comment: 1043-20-04 - Run 8 (DCAA) 2/3/00 10:46
Original value (CoefA0) = 0.0112 New value = -0.771
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: D164

Comment: 1043-20-04 - Run 8 (DCAA) 2/3/00 10:46
Original value (CoefAf) = 3.0675 New value = 8.4885
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: E164

Comment: 1043-20-04 - Run 8 (DCAA) 2/3/00 10:46
Original value (CoefB) = 42.5099 New value = 21.9904
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: F164

Comment: 1043-20-04 - Run 8 (DCAA) 2/3/00 10:46
Original value (CoefD) = 0.0742 New value = 0.0538
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: J164

Comment: 1043-20-04 - Run 8 (DCAA) 2/3/00 10:46
Original value (S) = -0.0035 New value = -0.0156
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: C166

Comment: 1043-20-04 - Run 8 (HAA5) 2/3/00 10:47
Original value (CoefA0) = 0.0126 New value = -1.577
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: D166

Comment: 1043-20-04 - Run 8 (HAA5) 2/3/00 10:47
Original value (CoefAf) = 5.3349 New value = 15.3752
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: E166

Comment: 1043-20-04 - Run 8 (HAA5) 2/3/00 10:47
Original value (CoefB) = 45.039 New value = 23.0247
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: F166

Comment: 1043-20-04 - Run 8 (HAA5) 2/3/00 10:47
Original value (CoefD) = 0.0924 New value = 0.0503
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: J166

Comment: 1043-20-04 - Run 8 (HAA5) 2/3/00 10:47
Original value (S) = -0.0023 New value = -0.0063
Poor peak curve fit. Data was refit by iterative curve fit procedure.

ICR Information

ID / ICR#: MI0000220 / 411
 ICR Contact: Janice Skadsen
 Phone No.: 734 994 2840
 Period: 5/6/98 - 6/6/98 (30 B-S days)

Design Information

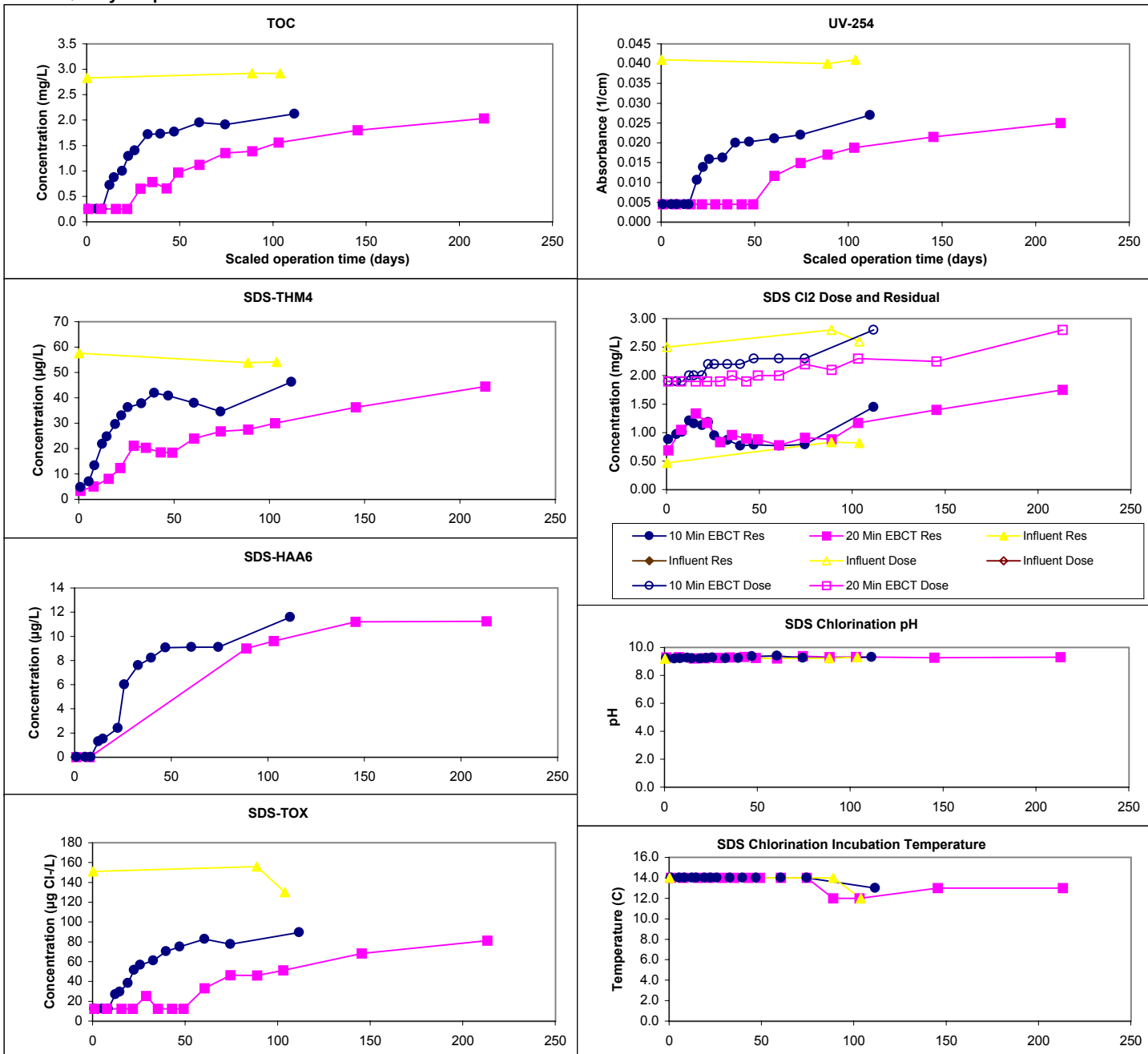
Design TOC: 2.6 mg/L
 Col Diameter: 8.0 mm
 Min Reynolds#: 0.50
 Full-Scale Temp: 14.0 C

Full-Scale GAC Size: 8x30 Bituminous
 Bench-Scale GAC Size: 60x80
 Scaling Factor: 6.88
 Meas Dry Bed Density: 0.46 g/cm3

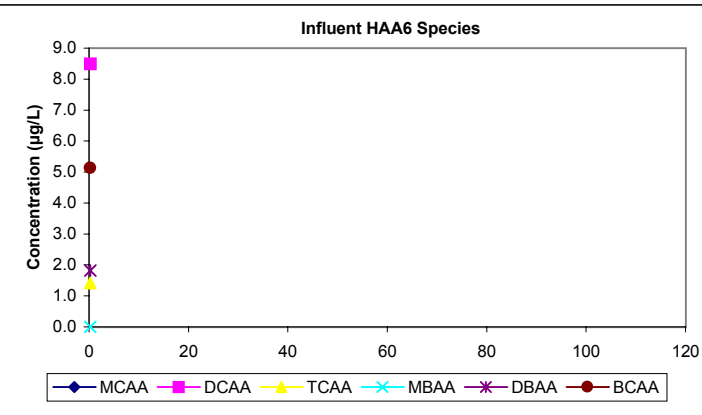
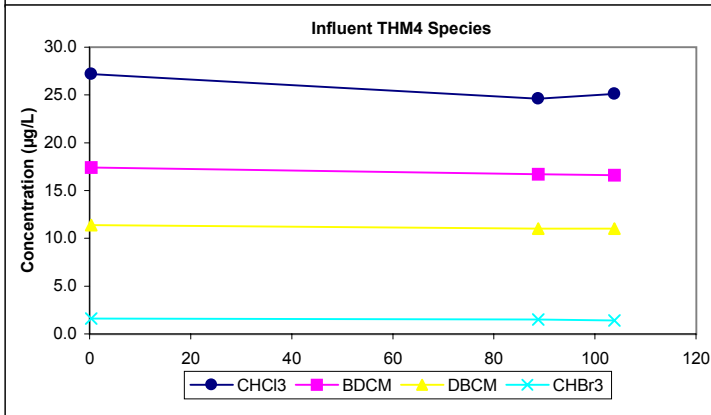
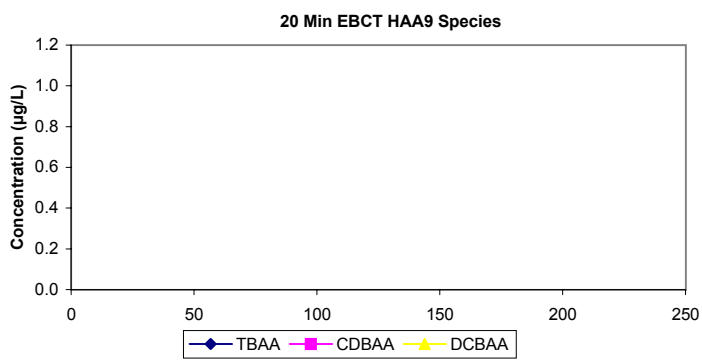
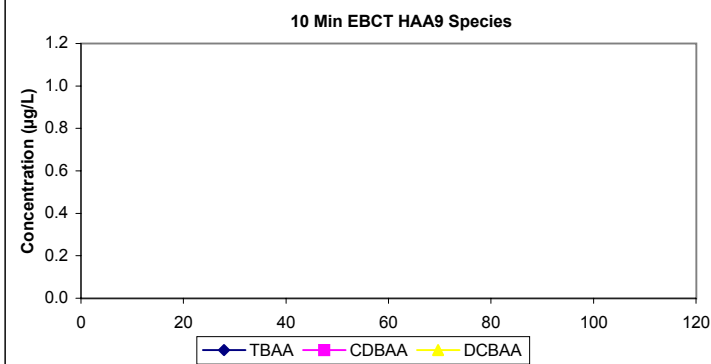
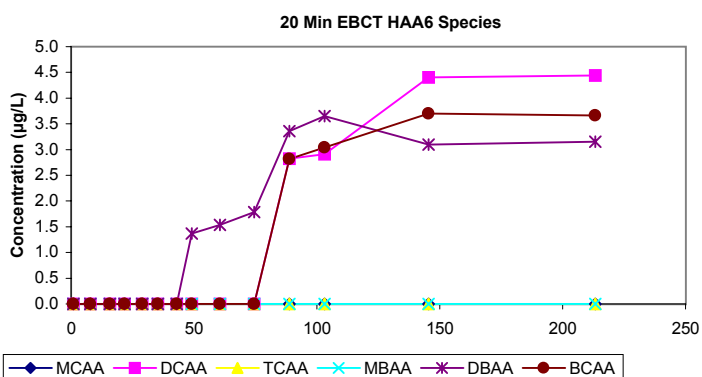
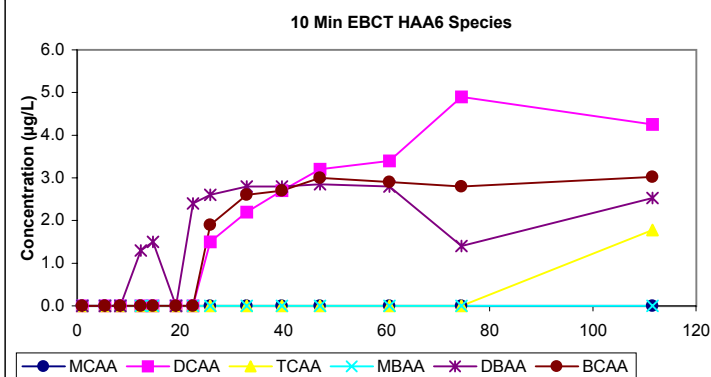
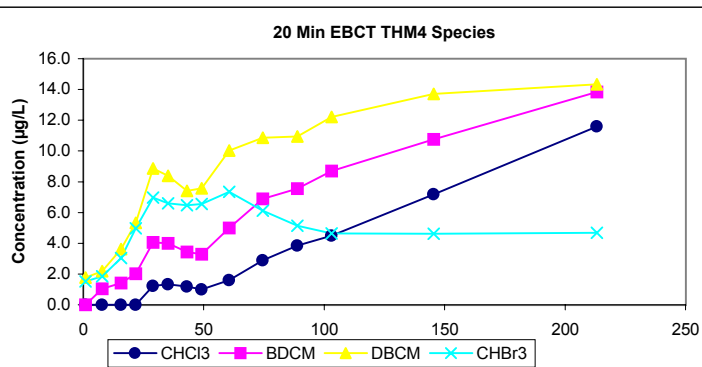
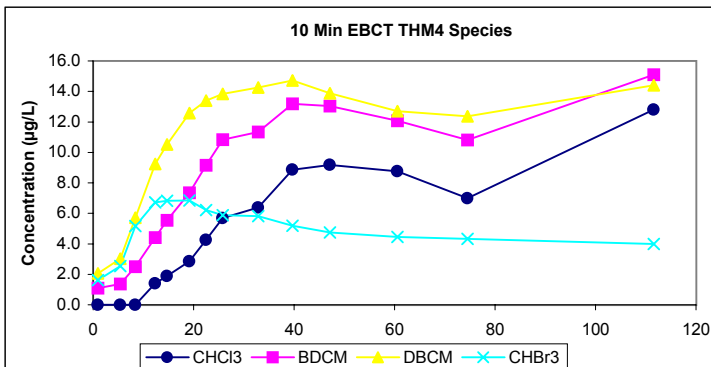
Water Quality Summary

Influent	Influent				Influent	Influent	Influent	Influent	Cumulative SDS Conditions			
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max				
TOC	2.9	0.1	3	2.8 - 2.9					Res (0)	0.99	0.26	31 0.47 - 1.75
pH	8.8	0.4	3	8.5 - 9.2					Temp	13.7	0.6	31 12.0 - 14.0
UV254	0.041	0.001	3	0.040 - 0.041					pH	9.3	0.1	31 9.2 - 9.4
SUVA	1.41	0.04	3	1.37 - 1.45					Time	20.5	0.8	31 19.5 - 24.0
Bromide	90	20	2	80 - 100					Comments:			
SDS-TOX	146	14	3	130 - 156								
SDS-THM4	55	2	3	54 - 58					Chart Legend:			
SDS-HAA6	NA	0	0	0 - 0								
Effluent	10 Min EBCT (16 B-S days)				20 Min EBCT (31 B-S days)				Chart Legend:			
Effluent pH	8.6	0.2	14	8.3 - 8.9	8.5	0.3	14	8.1 - 8.9				
Effluent Temp	20.0	0.0	14	20.0 - 20.0	20.0	0.0	14	20.0 - 20.0				

Water Quality Graphs



Water Quality Graphs (Continued)



ICR Information

ID / ICR#: MI0000220 / 411
 ICR Contact: Janice Skadsen
 Phone No.: 734 994 2840
 Period: 8/3/98 - 9/9/98 (37 B-S days)

Design Information

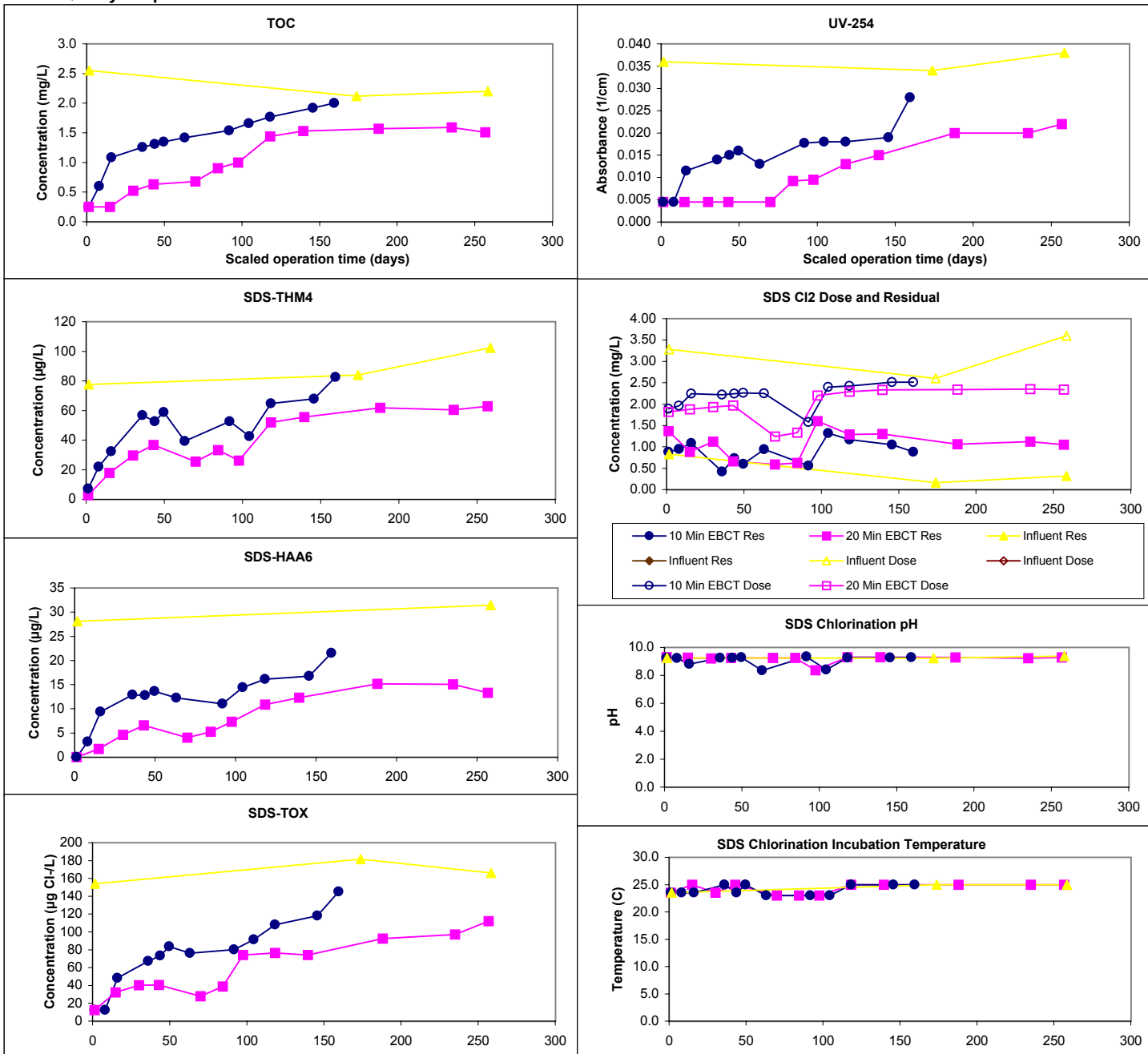
Design TOC: 2.6 mg/L
 Col Diameter: 8.0 mm
 Min Reynolds#: 0.50
 Full-Scale Temp: 23.0 C

Full-Scale GAC Size: 8x30 Bituminous
 Bench-Scale GAC Size: 60x80
 Scaling Factor: 6.88
 Meas Dry Bed Density: 0.46 g/cm3

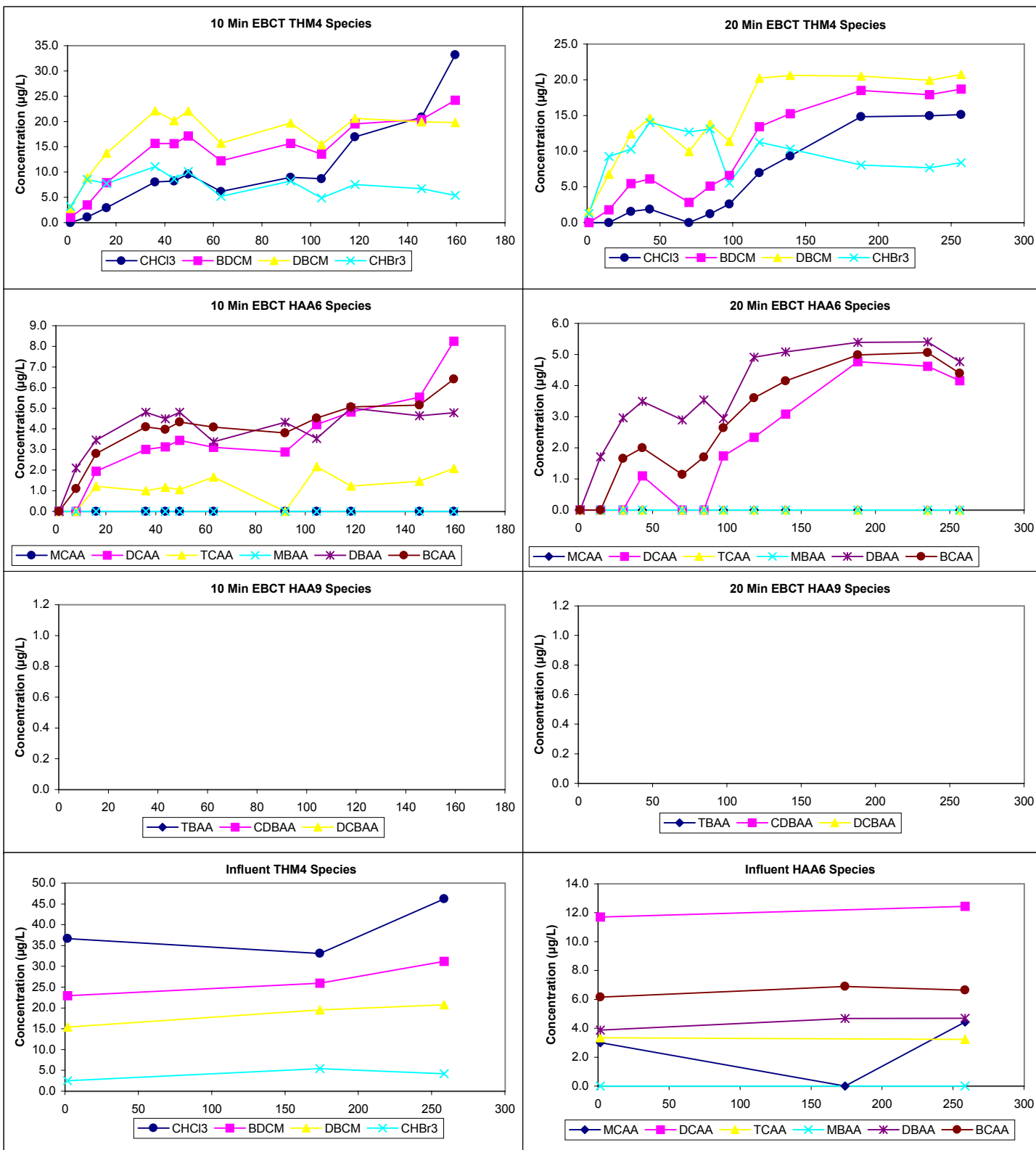
Water Quality Summary

Influent	Influent				Influent				Res (0)	Mean	SD	Count	Min/Max
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max					
TOC	2.3	0.2	3	2.1 - 2.6									
pH	9.2	0.2	3	9.0 - 9.5					Temp	24.2	0.9	27	23.0 - 25.0
UV254	0.036	0.002	3	0.034 - 0.038					pH	9.2	0.3	27	8.3 - 9.4
SUVA	1.58	0.16	3	1.41 - 1.73					Time	20.2	0.6	27	19.0 - 21.7
Bromide	96	5	2	93 - 99					Comments:				
SDS-TOX	167	14	3	154 - 182									
SDS-THM4	88	13	3	78 - 102									
SDS-HAA6	30	3	2	28 - 31									
Effluent	10 Min EBCT (23 B-S days)				20 Min EBCT (37 B-S days)				Chart Legend:	<div><div><div></div><div>10 Min EBCT</div></div><div><div></div><div>20 Min EBCT</div></div><div><div></div><div>Influent</div></div><div><div></div><div>Influent</div></div></div>			
Effluent pH	8.4	0.5	12	7.4 - 8.9	8.2	0.5	12	7.5 - 8.9					
Effluent Temp	20.0	0.0	12	20.0 - 20.0	20.0	0.0	12	20.0 - 20.0					

Water Quality Graphs



Water Quality Graphs (Continued)



ICR Information

ID / ICR#: MI0000220 / 411
 ICR Contact: Janice Skadsen
 Phone No.: 734 994 2840
 Period: 11/5/98 - 12/9/98 (34 B-S days)

Design Information

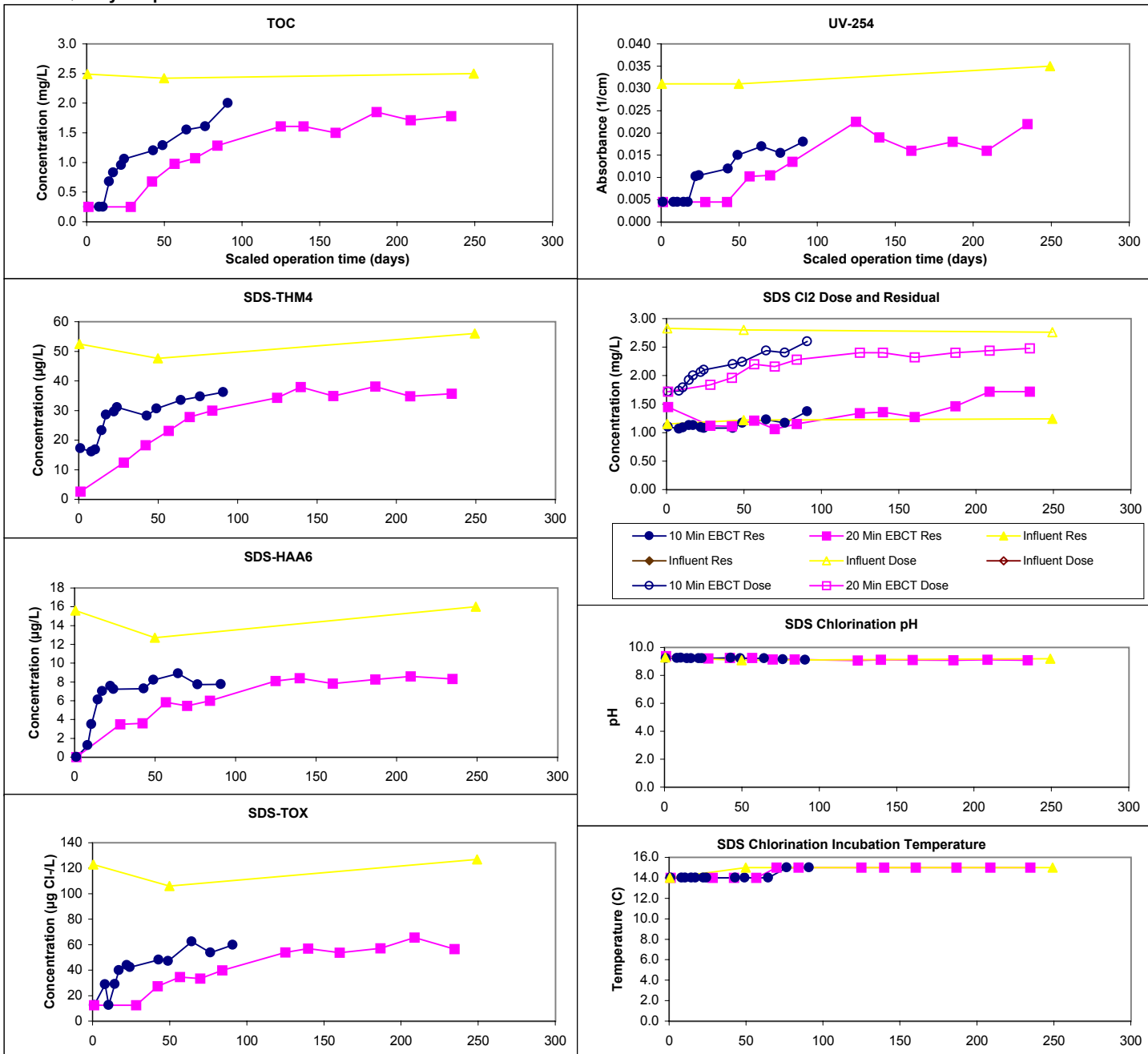
Design TOC: 2.5 mg/L
 Col Diameter: 8.0 mm
 Min Reynolds#: 0.50
 Full-Scale Temp: 15.0 C

Full-Scale GAC Size: 8x30 Bituminous
 Bench-Scale GAC Size: 60x80
 Scaling Factor: 6.88
 Meas Dry Bed Density: 0.44 g/cm3

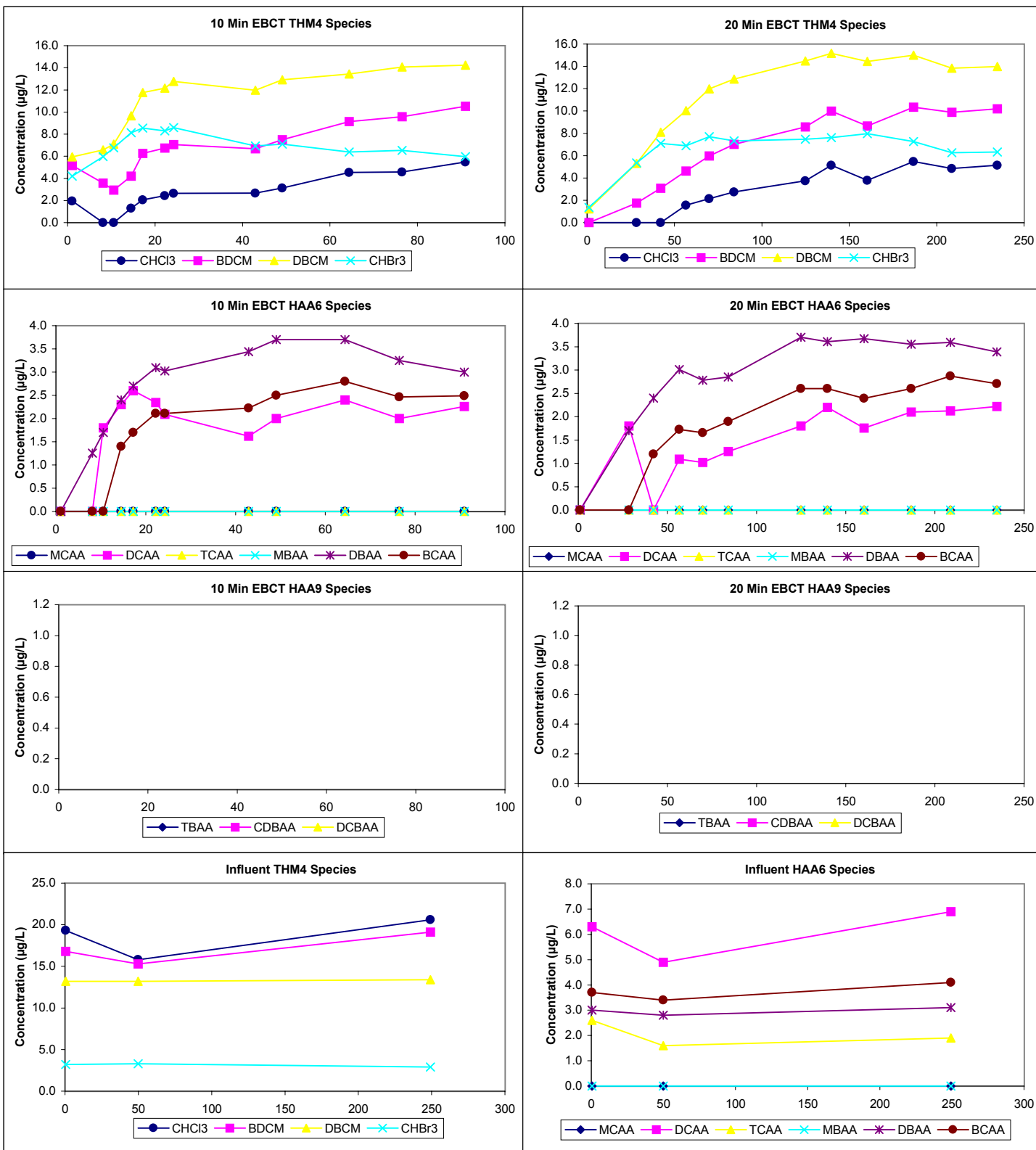
Water Quality Summary

Influent	Influent				Influent				Res (0)	Mean	SD	Count	Min/Max
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max					
TOC	2.5	0.0	3	2.4 - 2.5									
pH	9.0	0.1	3	8.9 - 9.2					Temp	14.4	0.5	27	14.0 - 15.0
UV254	0.032	0.002	3	0.031 - 0.035					pH	9.2	0.1	27	9.1 - 9.4
SUVA	1.31	0.08	3	1.24 - 1.40					Time	20.4	0.5	27	19.8 - 21.1
Bromide	87	69	2	53 - 122					Comments:				
SDS-TOX	119	11	3	106 - 127									
SDS-THM4	52	4	3	48 - 56					Chart Legend: <div><div><div></div><div>10 Min EBCT</div></div><div><div></div><div>20 Min EBCT</div></div><div><div></div><div>Influent</div></div><div><div></div><div>Influent</div></div></div>				
SDS-HAA6	15	2	3	13 - 16									
Effluent	10 Min EBCT (13 B-S days)				20 Min EBCT (34 B-S days)								
Effluent pH	8.1	0.5	12	7.4 - 8.9	8.4	0.4	12	7.2 - 9.2					
Effluent Temp	20.0	0.0	12	20.0 - 20.0	20.0	0.0	12	20.0 - 20.0					

Water Quality Graphs



Water Quality Graphs (Continued)



ICR Information

ID / ICR#: MI0000220 / 411
 ICR Contact: Janice Skadsen
 Phone No.: 734 994 2840
 Period: 2/17/99 - 3/24/99 (35 B-S days)

Design Information

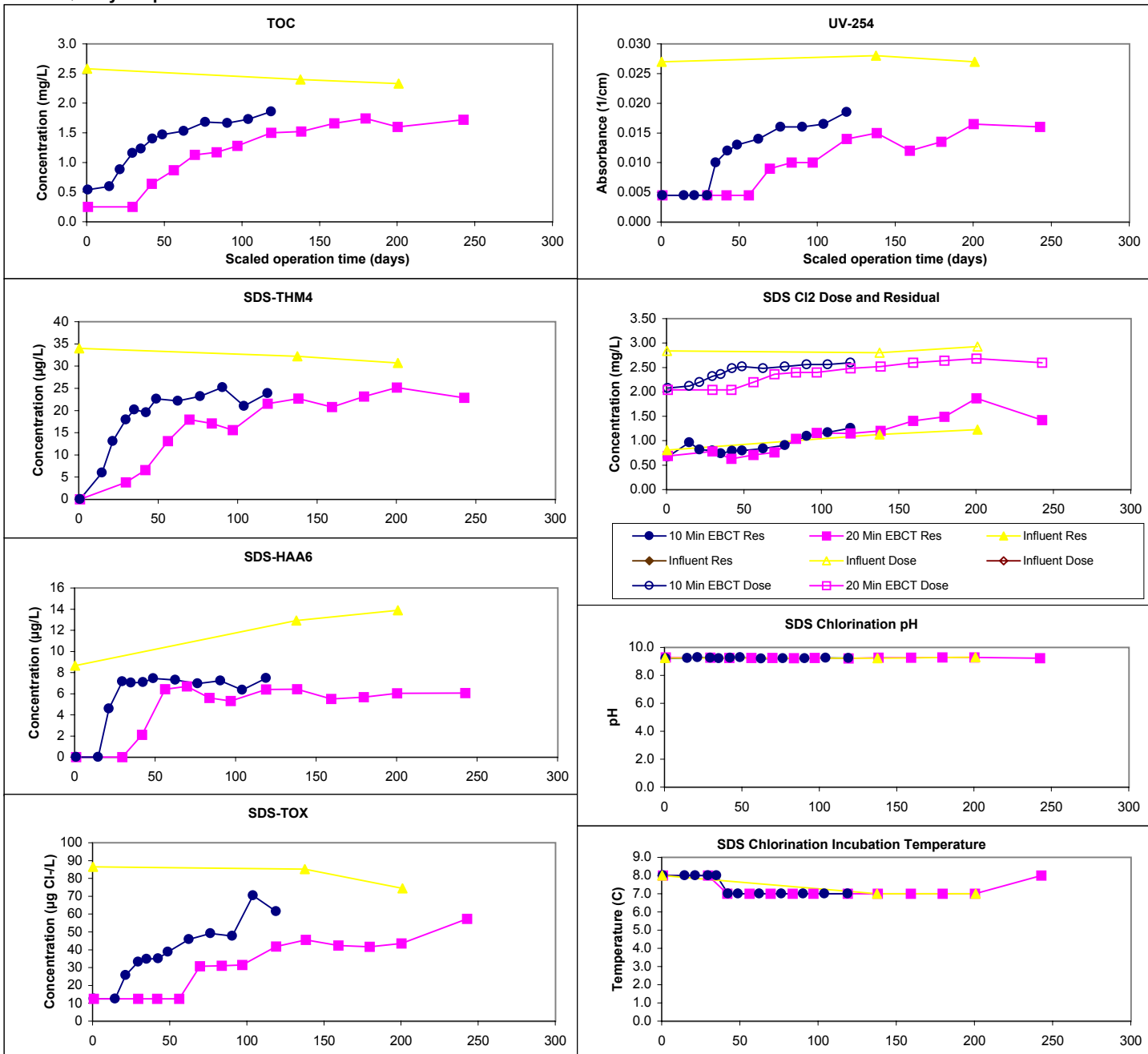
Design TOC: 2.5 mg/L
 Col Diameter: 8.0 mm
 Min Reynolds#: 0.50
 Full-Scale Temp: 7.0 C

Full-Scale GAC Size: 8x30 Bituminous
 Bench-Scale GAC Size: 60x80
 Scaling Factor: 6.88
 Meas Dry Bed Density: 0.44 g/cm3

Water Quality Summary

Influent	Influent				Influent				Res (0)	Mean	SD	Count	Min/Max
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max					
TOC	2.4	0.1	3	2.3 - 2.6									
pH	8.9	0.1	3	8.8 - 9.0									
UV254	0.027	0.001	3	0.027 - 0.028									
SUVA	1.12	0.07	3	1.05 - 1.17									
Bromide	101	1	2	100 - 101									
SDS-TOX	82	7	3	74 - 87									
SDS-THM4	32	2	3	31 - 34									
SDS-HAA6	12	3	3	9 - 14									
Effluent	10 Min EBCT (17 B-S days)				20 Min EBCT (35 B-S days)				Chart Legend:				
Effluent pH	8.6	0.3	12	8.2 - 9.2	8.5	0.3	13	8.1 - 9.5					
Effluent Temp	21.3	0.5	12	21.0 - 22.0	21.7	0.8	13	21.0 - 23.0					

Water Quality Graphs



Water Quality Graphs (Continued)

