

# ICR TREATMENT STUDY ANALYSIS

## Base Analysis and Data Review Comments

<b>Treatment Study ID</b>	1038
<b>Study Protocol</b>	GAC RSSCT treatment study
<b>Plant ICR Number</b>	139
<b>PWS Name</b>	East Bay MUD
<b>City, State, Zip</b>	Oakland, CA 94607

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

### Major comments:

(none)

### General Comments:

1. Water sampled after filtration, using dual media GAC/sand filters.
2. Measured dry bed density was reported as  $0.50 \text{ g/cm}^3$  for all quarters. Experimental results of dry bed density measurement were probably not reported.
3. Scaling factor reported in Table 4 (13.6) should read 13.16.
4. Values below the MRL (as reported in the summary report) are reported for TOC, UV254, THM, and HAA. It is acceptable to report these measured values below the MRL, however, results below the MRL should be considered estimates.

### Outlier Data:

One outlier removed.

**Cell: A1**

**Comment:** 1038-SAS.xls 2/15/00 21:05

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

**Cell: C5**

**Comment:** 1038-10-01 - Run 1 (CHBr3) 2/15/00 19:52

Original value (CoefA0) = 0 New value = -1.1055

Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: D5**

**Comment:** 1038-10-01 - Run 1 (CHBr3) 2/15/00 19:53

Original value (CoefAf) = 0 New value = 895.5937

Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: E5**

**Comment:** 1038-10-01 - Run 1 (CHBr3) 2/15/00 19:53

Original value (CoefB) = 0 New value = 1682.1665

Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: F5**

**Comment:** 1038-10-01 - Run 1 (CHBr3) 2/15/00 19:53

Original value (CoefD) = 0 New value = 0.0588

Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: J5**

**Comment:** 1038-10-01 - Run 1 (CHBr3) 2/15/00 19:53

Original value (S) = 0 New value = -0.0584

Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: C8**

**Comment:** 1038-10-01 - Run 1 (DBAA) 2/15/00 19:56

Original value (CoefA0) = 0.0513 New value = -0.227

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

**Cell: D8**

**Comment:** 1038-10-01 - Run 1 (DBAA) 2/15/00 19:56

Original value (CoefAf) = 2.9579 New value = 3.9501

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

**Cell: E8**

**Comment:** 1038-10-01 - Run 1 (DBAA) 2/15/00 19:56

Original value (CoefB) = 45.4569 New value = 102.7461

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

**Cell: F8**

**Comment:** 1038-10-01 - Run 1 (DBAA) 2/15/00 19:56

Original value (CoefD) = 0.1108 New value = 0.1365

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

**Cell: J8**

**Comment:** 1038-10-01 - Run 1 (DBAA) 2/15/00 19:56

Original value (S) = -0.016 New value = -0.0298

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

**Cell: C9**

**Comment:** 1038-10-01 - Run 1 (DBCM) 2/15/00 20:00

Original value (CoefA0) = 0.2417 New value = 0.0889

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

**Cell: D9**

**Comment:** 1038-10-01 - Run 1 (DBCM) 2/15/00 20:00  
Original value (CoefAf) = 9.9651 New value = 12.5732  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell: E9**

**Comment:** 1038-10-01 - Run 1 (DBCM) 2/15/00 20:00  
Original value (CoefB) = 78.9509 New value = 200.0133  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell: F9**

**Comment:** 1038-10-01 - Run 1 (DBCM) 2/15/00 20:00  
Original value (CoefD) = 0.1307 New value = 0.1499  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell: J9**

**Comment:** 1038-10-01 - Run 1 (DBCM) 2/15/00 20:00  
Original value (S) = -0.0377 New value = -0.0705  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell: C18**

**Comment:** 1038-10-01 - Run 1 (TCAA) 2/15/00 19:54  
Original value (CoefA0) = 0 New value = -0.1968  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell: D18**

**Comment:** 1038-10-01 - Run 1 (TCAA) 2/15/00 19:54  
Original value (CoefAf) = 0 New value = 6.5532  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell: E18**

**Comment:** 1038-10-01 - Run 1 (TCAA) 2/15/00 19:54  
Original value (CoefB) = 0 New value = 451.4965  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell: F18**

**Comment:** 1038-10-01 - Run 1 (TCAA) 2/15/00 19:54  
Original value (CoefD) = 0 New value = 0.1061  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell: J18**

**Comment:** 1038-10-01 - Run 1 (TCAA) 2/15/00 19:54  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell: C21**

**Comment:** 1038-10-01 - Run 1 (TOX) 2/15/00 19:58  
Original value (CoefA0) = 99999 New value = -68.0332  
Fewer than 6 points. Logistic function (type 1) applied.

**Cell: D21**

**Comment:** 1038-10-01 - Run 1 (TOX) 2/15/00 19:58  
Original value (CoefAf) = 99999 New value = 155.0746  
Fewer than 6 points. Logistic function (type 1) applied.

**Cell: E21**

**Comment:** 1038-10-01 - Run 1 (TOX) 2/15/00 19:58  
Original value (CoefB) = 99999 New value = 0.5322  
Fewer than 6 points. Logistic function (type 1) applied.

**Cell: F21**

**Comment:** 1038-10-01 - Run 1 (TOX) 2/15/00 19:58

Original value (CoefD) = 99999 New value = 0.0239  
Fewer than 6 points. Logistic function (type 1) applied.

**Cell:** J21

**Comment:** 1038-10-01 - Run 1 (TOX) 2/15/00 19:58  
Original value (S) = 0 New value = 0  
Fewer than 6 points. Logistic function (type 1) applied.

**Cell:** C27

**Comment:** 1038-10-02 - Run 3 (CHBr3) 2/15/00 20:05  
Original value (CoefA0) = -0.0748 New value = -0.6292  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** D27

**Comment:** 1038-10-02 - Run 3 (CHBr3) 2/15/00 20:05  
Original value (CoefAf) = 3.9177 New value = 17.0533  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** E27

**Comment:** 1038-10-02 - Run 3 (CHBr3) 2/15/00 20:05  
Original value (CoefB) = 6.1186 New value = 19.9176  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** F27

**Comment:** 1038-10-02 - Run 3 (CHBr3) 2/15/00 20:05  
Original value (CoefD) = 0.0494 New value = 0.0932  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** J27

**Comment:** 1038-10-02 - Run 3 (CHBr3) 2/15/00 20:05  
Original value (S) = 0 New value = -0.1439  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** C51

**Comment:** 1038-10-03 - Run 5 (Cl2-D) 2/15/00 20:09  
Original value (CoefA0) = 0.4042 New value = 0.4763  
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

**Cell:** D51

**Comment:** 1038-10-03 - Run 5 (Cl2-D) 2/15/00 20:09  
Original value (CoefAf) = 2.4 New value = 0.8245  
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

**Cell:** E51

**Comment:** 1038-10-03 - Run 5 (Cl2-D) 2/15/00 20:09  
Original value (CoefB) = 31.6211 New value = 1309.8104  
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

**Cell:** F51

**Comment:** 1038-10-03 - Run 5 (Cl2-D) 2/15/00 20:09  
Original value (CoefD) = 0.0832 New value = 0.292  
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

**Cell:** J51

**Comment:** 1038-10-03 - Run 5 (Cl2-D) 2/15/00 20:09  
Original value (S) = 0 New value = 0  
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

**Cell:** C71

**Comment:** 1038-10-04 - Run 7 (CHBr3) 2/15/00 20:14  
Original value (CoefA0) = 0 New value = -0.181  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: D71**

**Comment:** 1038-10-04 - Run 7 (CHBr3) 2/15/00 20:14  
Original value (CoefAf) = 0 New value = 2.8331  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: E71**

**Comment:** 1038-10-04 - Run 7 (CHBr3) 2/15/00 20:14  
Original value (CoefB) = 0 New value = 20.0019  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: F71**

**Comment:** 1038-10-04 - Run 7 (CHBr3) 2/15/00 20:14  
Original value (CoefD) = 0 New value = 0.5674  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: J71**

**Comment:** 1038-10-04 - Run 7 (CHBr3) 2/15/00 20:14  
Original value (S) = 0 New value = -0.0926  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: C106**

**Comment:** 1038-20-01 - Run 2 (TCAA) 2/15/00 20:03  
Original value (CoefA0) = 0 New value = -0.846  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell: D106**

**Comment:** 1038-20-01 - Run 2 (TCAA) 2/15/00 20:03  
Original value (CoefAf) = 0 New value = 8.782  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell: E106**

**Comment:** 1038-20-01 - Run 2 (TCAA) 2/15/00 20:03  
Original value (CoefB) = 0 New value = 21.7849  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell: F106**

**Comment:** 1038-20-01 - Run 2 (TCAA) 2/15/00 20:03  
Original value (CoefD) = 0 New value = 0.0198  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell: J106**

**Comment:** 1038-20-01 - Run 2 (TCAA) 2/15/00 20:03  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell: C110**

**Comment:** 1038-20-01 - Run 2 (TSUVA) 2/15/00 20:01  
Original value (CoefA0) = 99999 New value = -0.0015  
Fewer than 6 points. Logistic function (type 1) applied.

**Cell: D110**

**Comment:** 1038-20-01 - Run 2 (TSUVA) 2/15/00 20:01  
Original value (CoefAf) = 99999 New value = 1.3679  
Fewer than 6 points. Logistic function (type 1) applied.

**Cell: E110**

**Comment:** 1038-20-01 - Run 2 (TSUVA) 2/15/00 20:01  
Original value (CoefB) = 99999 New value = 345.9763  
Fewer than 6 points. Logistic function (type 1) applied.

**Cell: F110**

**Comment:** 1038-20-01 - Run 2 (TSUVA) 2/15/00 20:01

Original value (CoefD) = 99999 New value = 0.0614  
Fewer than 6 points. Logistic function (type 1) applied.

**Cell:** J110

**Comment:** 1038-20-01 - Run 2 (TSUVA) 2/15/00 20:01  
Original value (S) = 0 New value = 0  
Fewer than 6 points. Logistic function (type 1) applied.

**Cell:** C115

**Comment:** 1038-20-02 - Run 4 (CHBr3) 2/15/00 20:08  
Original value (CoefA0) = 0 New value = -0.7406  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell:** D115

**Comment:** 1038-20-02 - Run 4 (CHBr3) 2/15/00 20:08  
Original value (CoefAf) = 0 New value = 9.8616  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell:** E115

**Comment:** 1038-20-02 - Run 4 (CHBr3) 2/15/00 20:08  
Original value (CoefB) = 0 New value = 21.4971  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell:** F115

**Comment:** 1038-20-02 - Run 4 (CHBr3) 2/15/00 20:08  
Original value (CoefD) = 0 New value = 0.0623  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell:** J115

**Comment:** 1038-20-02 - Run 4 (CHBr3) 2/15/00 20:08  
Original value (S) = 0 New value = -0.045  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell:** C119

**Comment:** 1038-20-02 - Run 4 (DBCM) 2/15/00 20:06  
Original value (CoefA0) = 0.5383 New value = 0.5401  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** D119

**Comment:** 1038-20-02 - Run 4 (DBCM) 2/15/00 20:06  
Original value (CoefAf) = 11.872 New value = 13.3599  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** E119

**Comment:** 1038-20-02 - Run 4 (DBCM) 2/15/00 20:06  
Original value (CoefB) = 13.8263 New value = 172.2369  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** F119

**Comment:** 1038-20-02 - Run 4 (DBCM) 2/15/00 20:06  
Original value (CoefD) = 0.0632 New value = 0.1245  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** J119

**Comment:** 1038-20-02 - Run 4 (DBCM) 2/15/00 20:06  
Original value (S) = -0.0255 New value = -0.0337  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** C137

**Comment:** 1038-20-03 - Run 6 (CHBr3) 2/15/00 20:12  
Original value (CoefA0) = 0.6269 New value = 0.4089  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell: D137**

**Comment:** 1038-20-03 - Run 6 (CHBr3) 2/15/00 20:12  
Original value (CoefAf) = 5.8916 New value = 63.4276  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell: E137**

**Comment:** 1038-20-03 - Run 6 (CHBr3) 2/15/00 20:12  
Original value (CoefB) = 18.4818 New value = 96.8867  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell: F137**

**Comment:** 1038-20-03 - Run 6 (CHBr3) 2/15/00 20:12  
Original value (CoefD) = 0.0606 New value = 0.0419  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell: J137**

**Comment:** 1038-20-03 - Run 6 (CHBr3) 2/15/00 20:12  
Original value (S) = -0.0198 New value = -0.027  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell: C139**

**Comment:** 1038-20-03 - Run 6 (Cl2-D) 2/15/00 20:11  
Original value (CoefA0) = 0.4181 New value = 0.441  
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

**Cell: D139**

**Comment:** 1038-20-03 - Run 6 (Cl2-D) 2/15/00 20:11  
Original value (CoefAf) = 2.43 New value = 0.7042  
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

**Cell: E139**

**Comment:** 1038-20-03 - Run 6 (Cl2-D) 2/15/00 20:11  
Original value (CoefB) = 21.6634 New value = 14.5186  
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

**Cell: F139**

**Comment:** 1038-20-03 - Run 6 (Cl2-D) 2/15/00 20:11  
Original value (CoefD) = 0.0199 New value = 0.0458  
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

**Cell: J139**

**Comment:** 1038-20-03 - Run 6 (Cl2-D) 2/15/00 20:11  
Original value (S) = 0 New value = 0  
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

**Cell: C159**

**Comment:** 1038-20-04 - Run 8 (CHBr3) 2/15/00 20:16  
Original value (CoefA0) = 0 New value = -0.2025  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: D159**

**Comment:** 1038-20-04 - Run 8 (CHBr3) 2/15/00 20:16  
Original value (CoefAf) = 0 New value = 3.8929  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: E159**

**Comment:** 1038-20-04 - Run 8 (CHBr3) 2/15/00 20:16  
Original value (CoefB) = 0 New value = 20.0264  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell: F159**

**Comment:** 1038-20-04 - Run 8 (CHBr3) 2/15/00 20:16

Original value (CoefD) = 0 New value = 0.0861  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell:** J159

**Comment:** 1038-20-04 - Run 8 (CHBr3) 2/15/00 20:16  
Original value (S) = 0 New value = -0.029  
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

**Cell:** C162

**Comment:** 1038-20-04 - Run 8 (DBAA) 2/15/00 20:18  
Original value (CoefA0) = 0.0135 New value = -0.058  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** D162

**Comment:** 1038-20-04 - Run 8 (DBAA) 2/15/00 20:18  
Original value (CoefAf) = 2.343 New value = 2.5741  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** E162

**Comment:** 1038-20-04 - Run 8 (DBAA) 2/15/00 20:18  
Original value (CoefB) = 63.4942 New value = 841.9693  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** F162

**Comment:** 1038-20-04 - Run 8 (DBAA) 2/15/00 20:18  
Original value (CoefD) = 0.0784 New value = 0.1504  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** J162

**Comment:** 1038-20-04 - Run 8 (DBAA) 2/15/00 20:18  
Original value (S) = -0.0033 New value = -0.0054  
Poor peak curve fit. Data was refit by iterative curve fit procedure.



## ICR Information

ID / ICR#: CA0110005 / 139  
 ICR Contact: Maria W. Tikkanen  
 Phone No.: 510-287-1561  
 Period: 4/8/98 - 4/23/98 (14 B-S days)

## Design Information

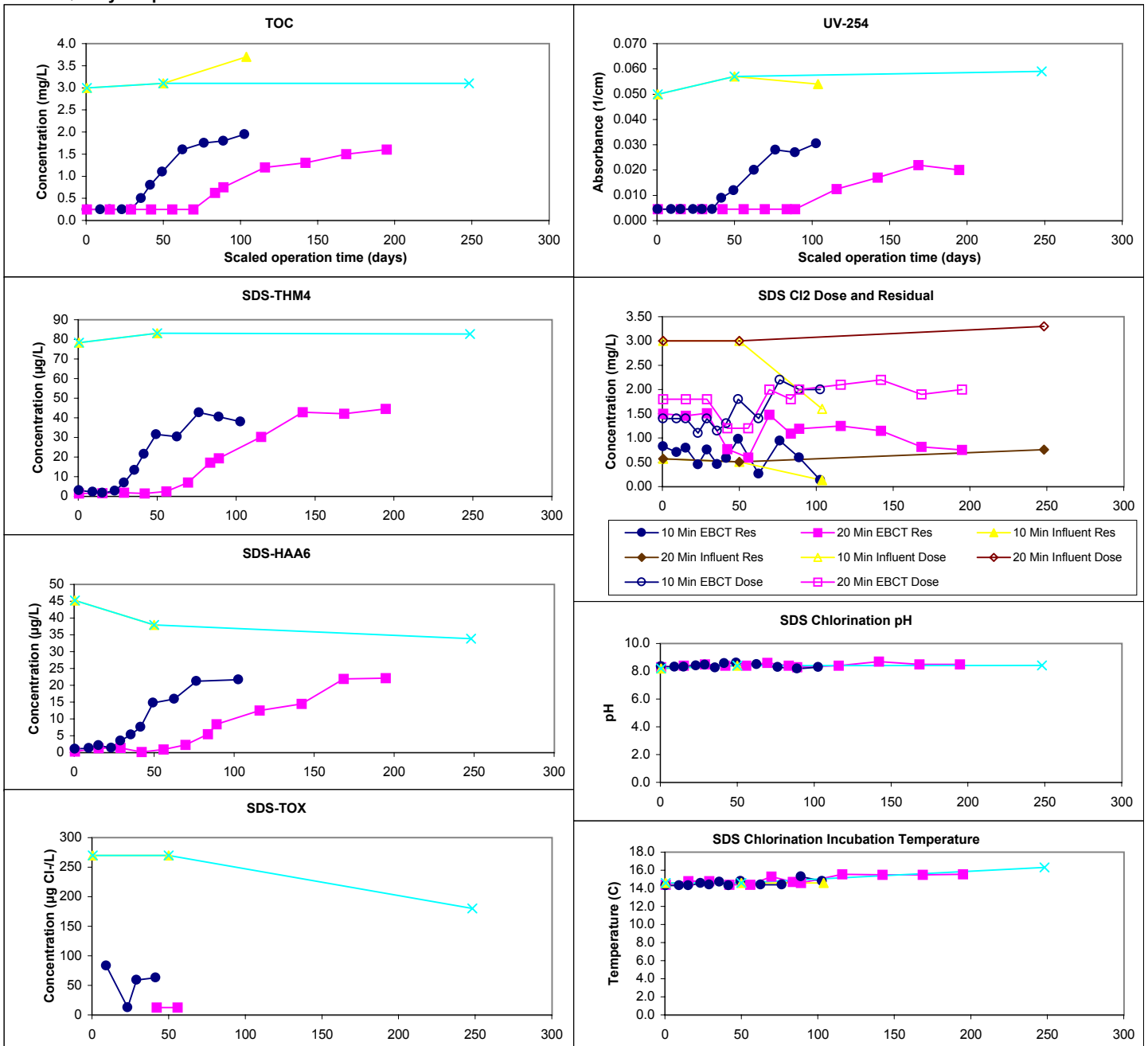
Design TOC: 3.0 mg/L  
 Col Diameter: 15.0 mm  
 Min Reynolds#: 0.50  
 Full-Scale Temp: 13.7 C

Full-Scale GAC Size: 8x30 bituminous  
 Bench-Scale GAC Size: 100x200  
 Scaling Factor: 13.16  
 Meas Dry Bed Density: 0.50 g/cm3

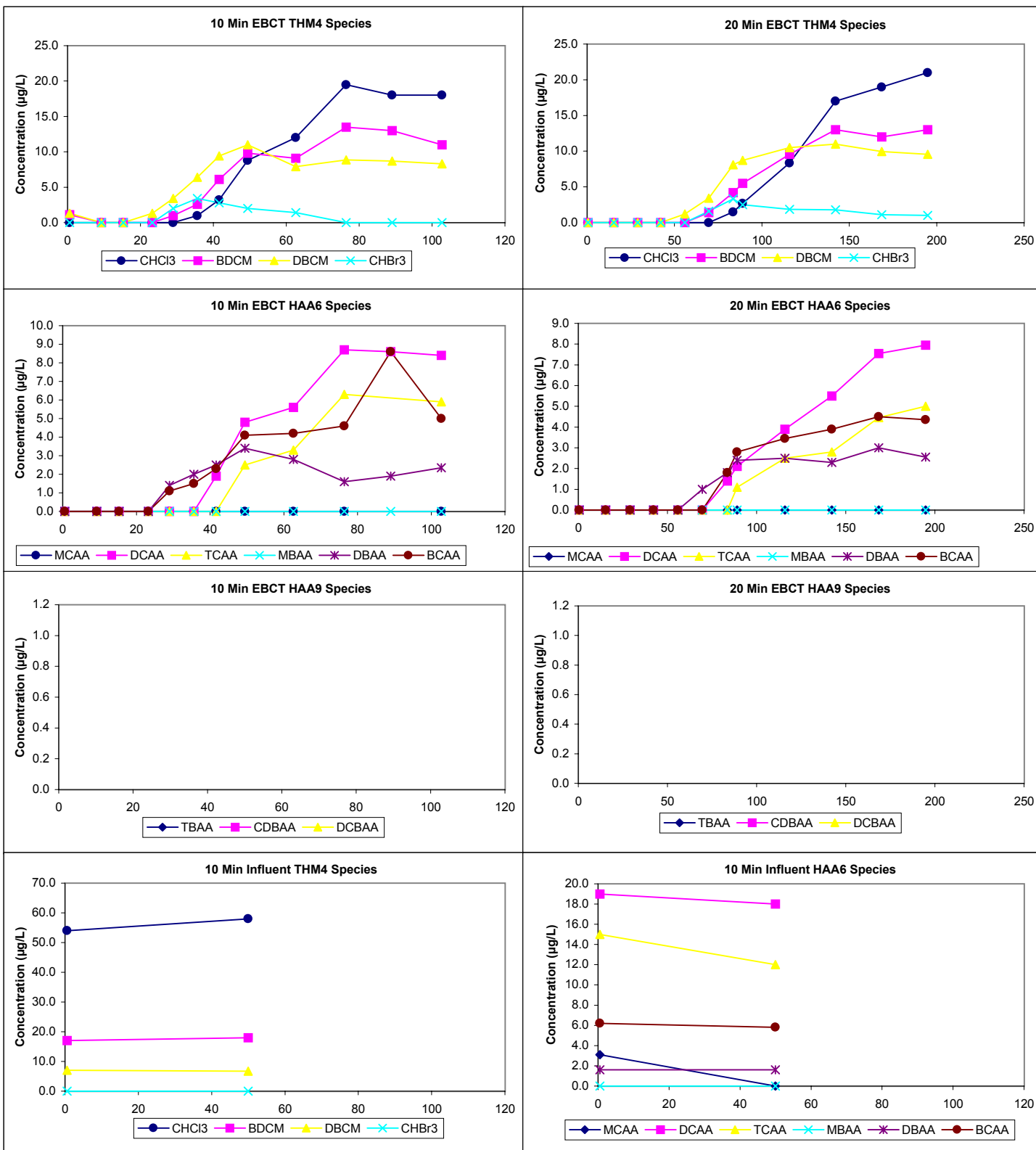
## Water Quality Summary

	10 Min Influent				20 Min Influent								
Influent	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max		Mean	SD	Count	Min/Max
TOC	3.3	0.4	3	3.0 - 3.7	3.1	0.1	3	3.0 - 3.1	Res (0)	0.80	0.39	30	0.13 - 1.51
pH	7.4	0.2	3	7.2 - 7.6	7.4	0.2	3	7.2 - 7.6	Temp	14.8	0.5	30	14.3 - 16.3
UV254	0.054	0.004	3	0.050 - 0.057	0.055	0.005	3	0.050 - 0.059	pH	8.4	0.1	29	8.2 - 8.7
SUVA	1.65	0.19	3	1.46 - 1.84	1.80	0.12	3	1.67 - 1.90	Time	96.2	5.1	29	93.0 - 116.0
Bromide	45	0	1	45 - 45	45	0	1	45 - 45	Comments:				
SDS-TOX	270	0	2	270 - 270	240	52	3	180 - 270					
SDS-THM4	81	5	2	78 - 83	81	3	3	78 - 83					
SDS-HAA6	42	7	2	38 - 45	39	6	3	34 - 45					
Effluent	10 Min EBCT (8 B-S days)				20 Min EBCT (15 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>10 Min Influent</div></div><div><div></div><div>20 Min Influent</div></div></div>			
Effluent pH	7.6	0.2	12	7.4 - 8.1	7.6	0.4	12	7.3 - 8.9					
Effluent Temp	14.9	0.6	12	14.3 - 16.4	15.0	0.8	12	14.2 - 16.9					

## Water Quality Graphs



## Water Quality Graphs (Continued)



## ICR Information

ID / ICR#: CA0110005 / 139  
 ICR Contact: Maria W. Tikkanen  
 Phone No.: 510-287-1561  
 Period: 9/8/98 - 9/29/98 (20 B-S days)

## Design Information

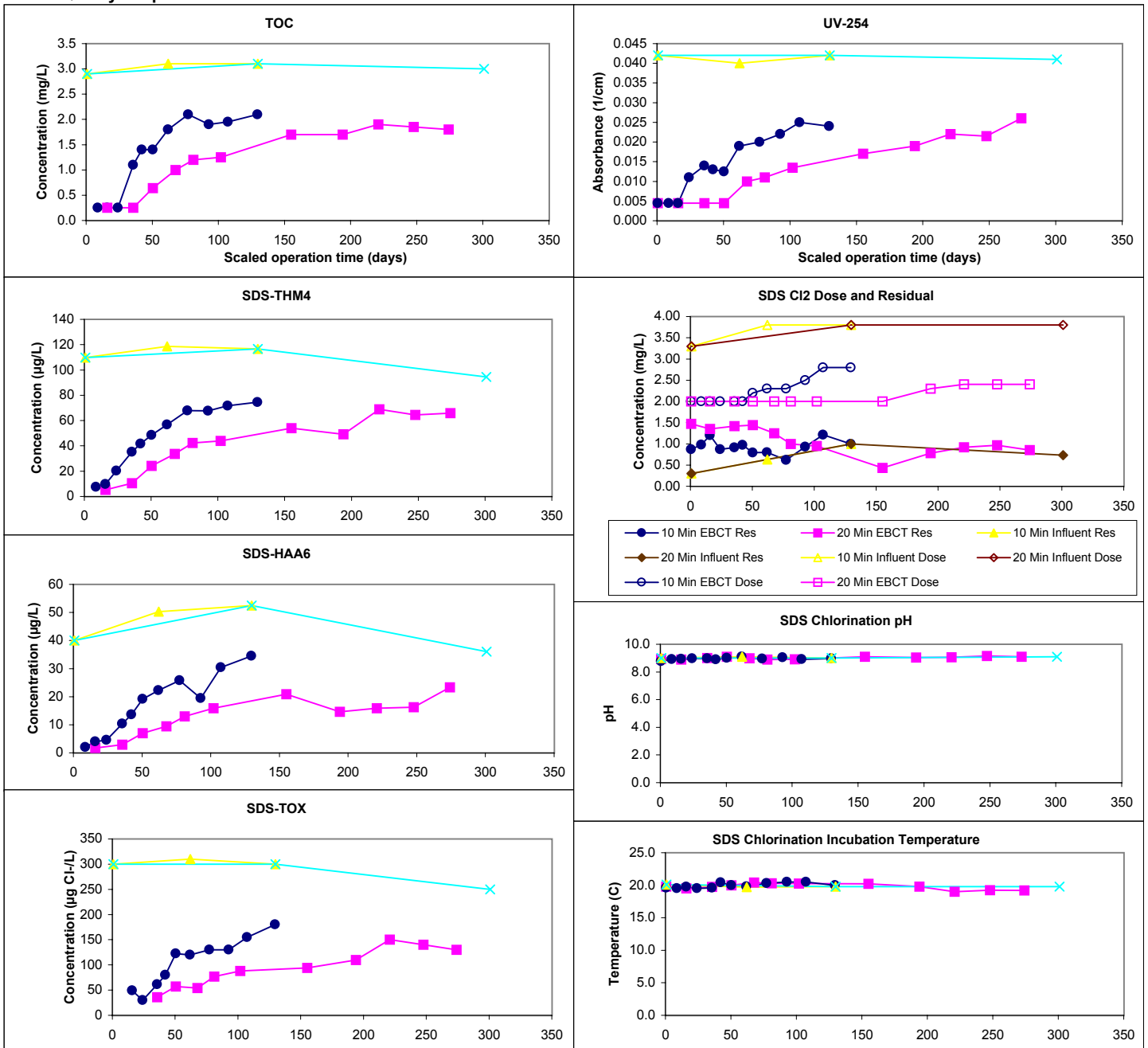
Design TOC: 2.8 mg/L  
 Col Diameter: 15.0 mm  
 Min Reynolds#: 0.50  
 Full-Scale Temp: 18.0 C

Full-Scale GAC Size: 8x30 bituminous  
 Bench-Scale GAC Size: 100x200  
 Scaling Factor: 13.16  
 Meas Dry Bed Density: 0.50 g/cm3

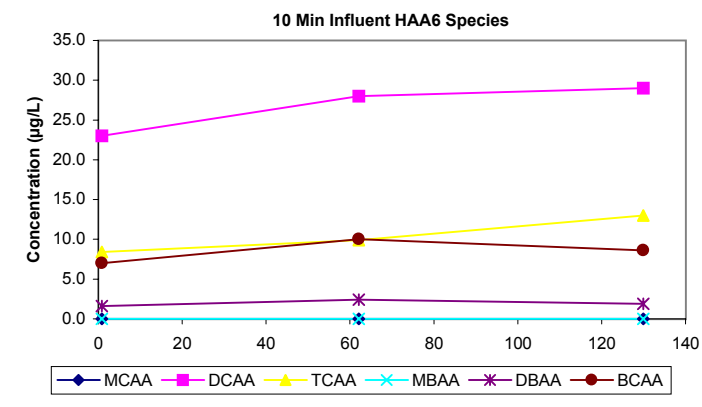
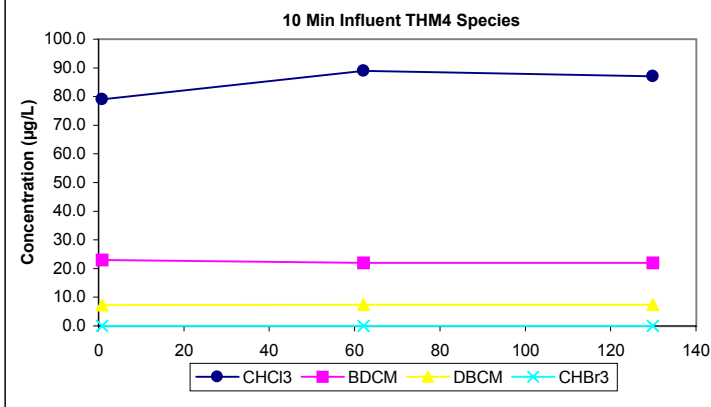
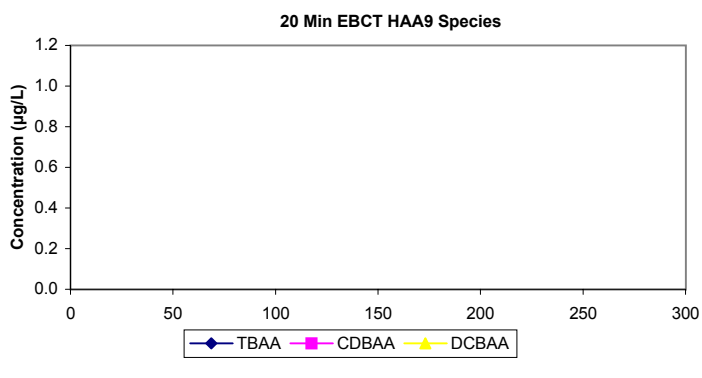
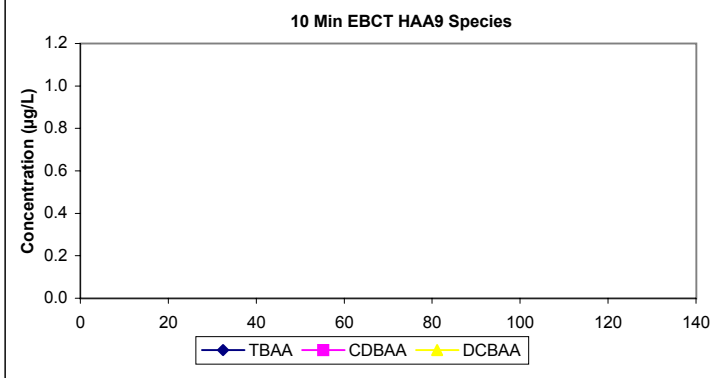
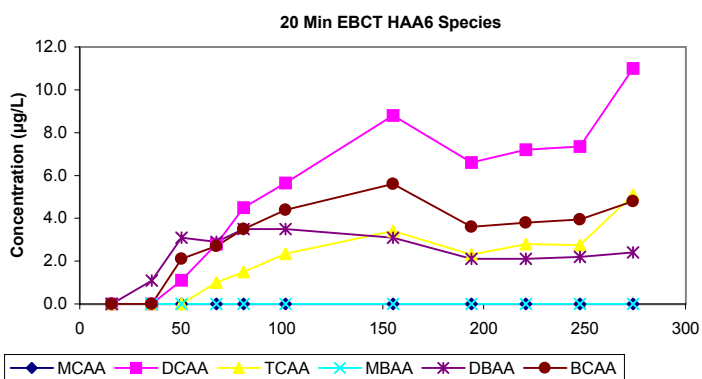
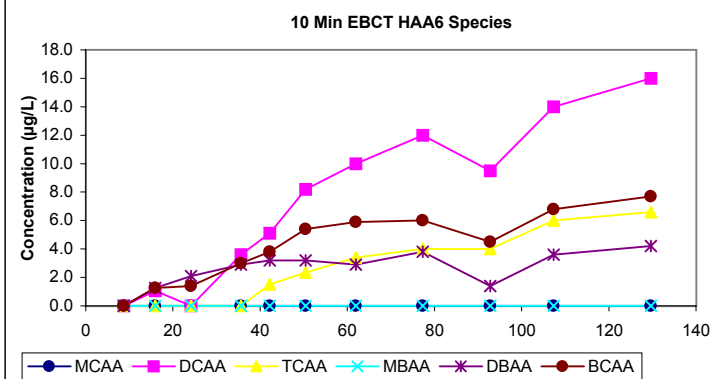
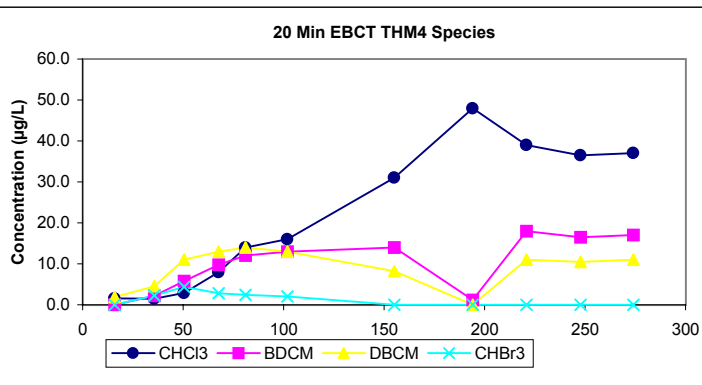
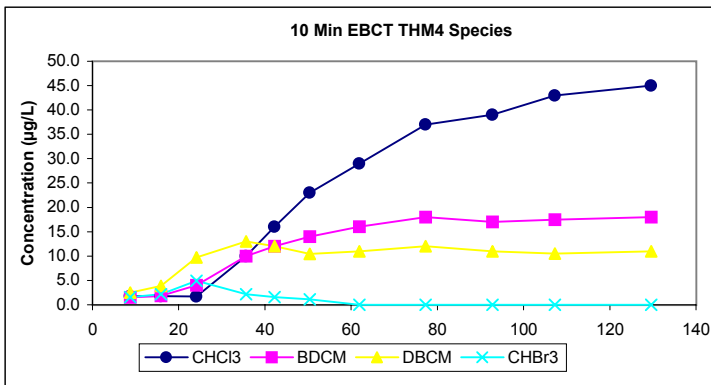
## Water Quality Summary

Influent	10 Min Influent				20 Min Influent				Res (0)	Mean	SD	Count	Min/Max
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max					
TOC	3.0	0.1	3	2.9 - 3.1	3.0	0.1	3	2.9 - 3.1	Temp	19.9	0.4	30	19.0 - 20.5
pH	7.8	0.0	3	7.8 - 7.8	7.9	0.1	3	7.8 - 8.0	pH	9.0	0.1	30	8.8 - 9.2
UV254	0.041	0.001	3	0.040 - 0.042	0.042	0.001	3	0.041 - 0.042	Time	47.7	0.7	30	46.0 - 49.0
SUVA	1.36	0.08	3	1.29 - 1.45	1.39	0.05	3	1.35 - 1.45	Comments:				
Bromide	46	1	2	45 - 46	46	1	2	45 - 46					
SDS-TOX	303	6	3	300 - 310	283	29	3	250 - 300					
SDS-THM4	115	5	3	110 - 119	107	11	3	94 - 117					
SDS-HAA6	48	7	3	40 - 53	43	9	3	36 - 53					
Effluent	10 Min EBCT (10 B-S days)				20 Min EBCT (21 B-S days)				Chart Legend:				
Effluent pH	7.9	0.1	12	7.7 - 8.3	8.0	0.1	12	7.8 - 8.1					
Effluent Temp	19.6	0.3	12	19.2 - 20.2	19.6	0.4	12	18.7 - 20.0					

## Water Quality Graphs



## Water Quality Graphs (Continued)



## ICR Information

ID / ICR#: CA0110005 / 139  
 ICR Contact: Maria W. Tikkanen  
 Phone No.: 510-287-1561  
 Period: 12/10/98 - 12/27/98 (16 B-S days)

## Design Information

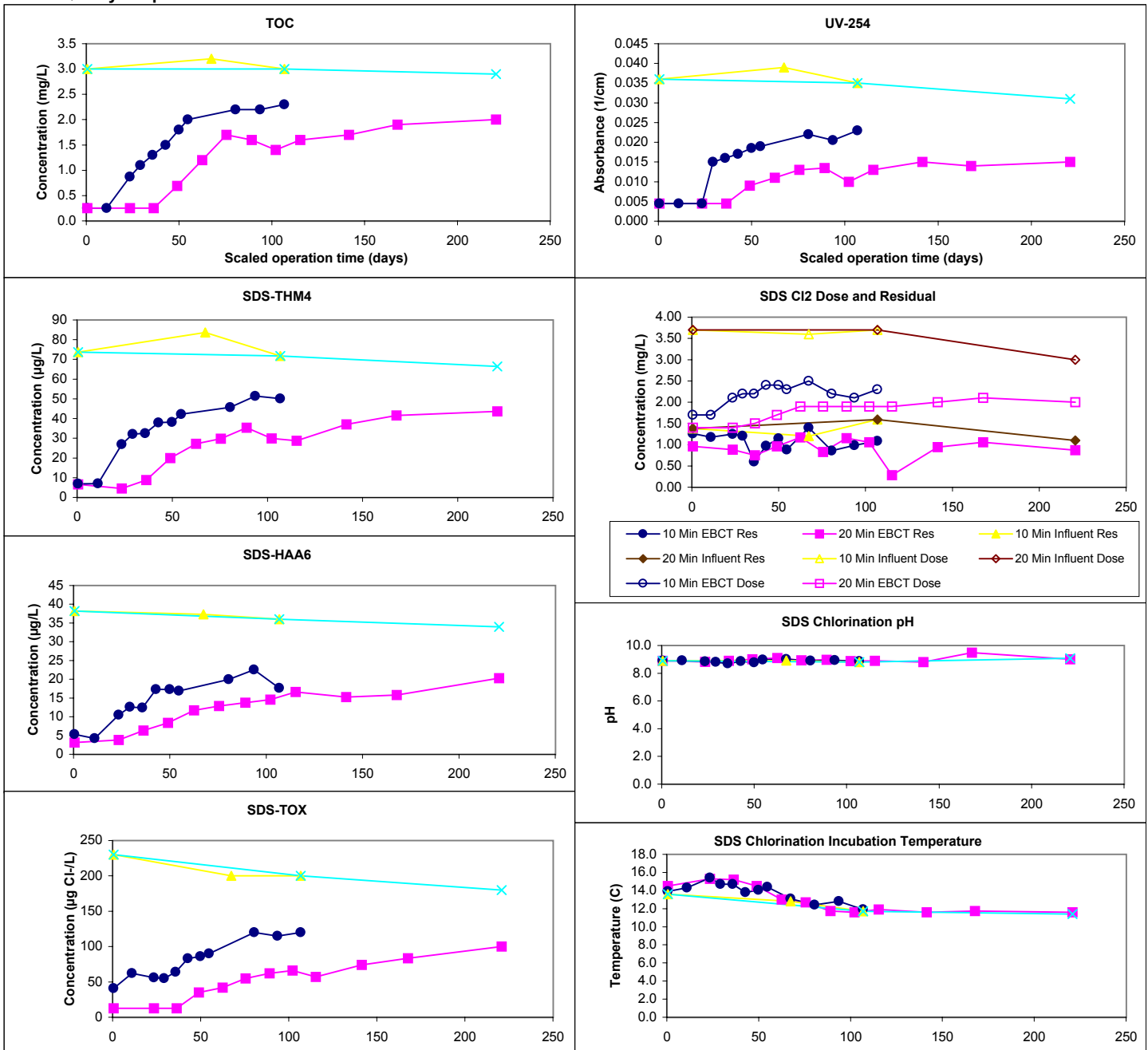
Design TOC: 3.1 mg/L  
 Col Diameter: 15.0 mm  
 Min Reynolds#: 0.50  
 Full-Scale Temp: 14.0 C

Full-Scale GAC Size: 8x30 bituminous  
 Bench-Scale GAC Size: 100x200  
 Scaling Factor: 13.16  
 Meas Dry Bed Density: 0.50 g/cm3

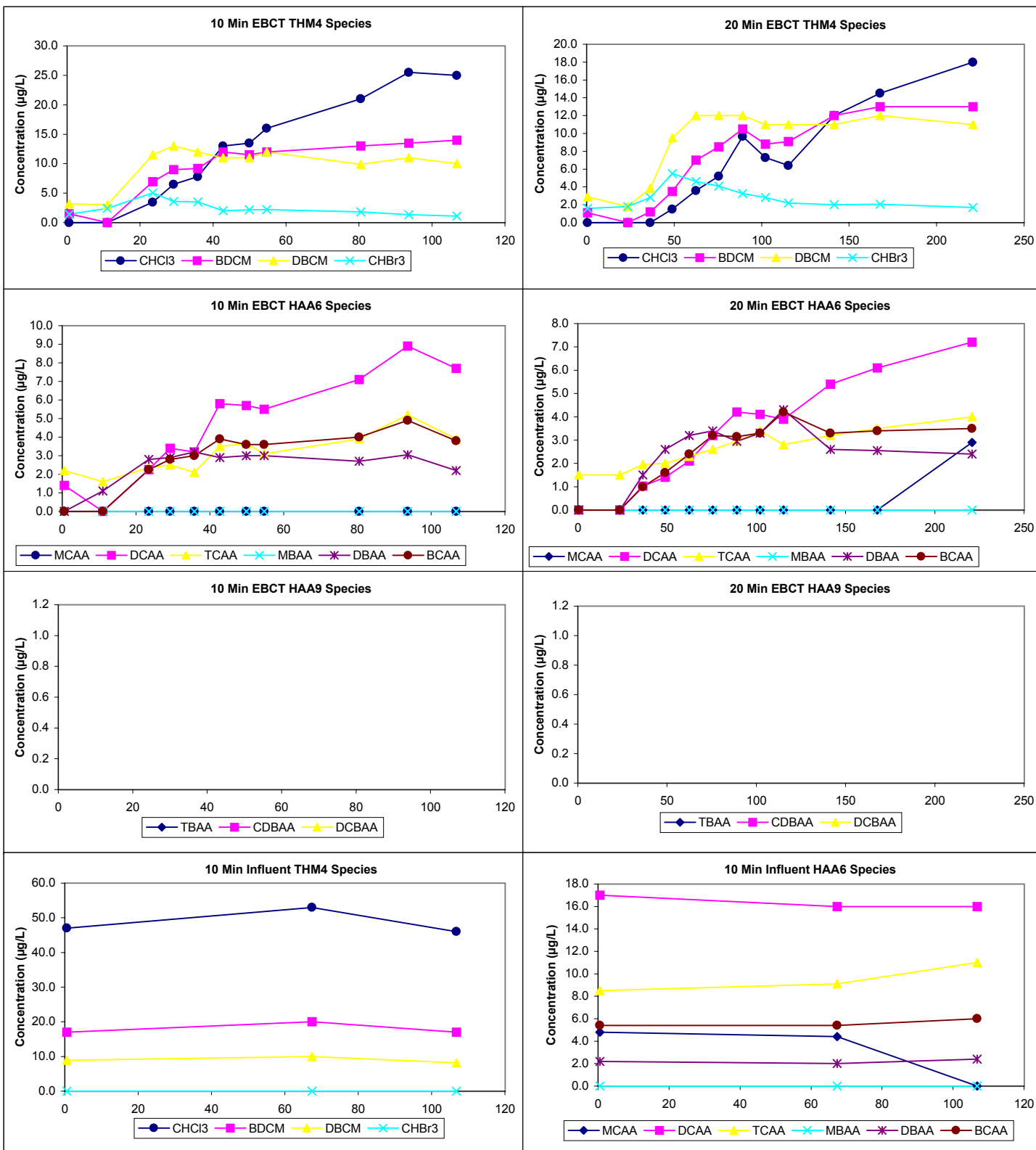
## Water Quality Summary

Influent	10 Min Influent				20 Min Influent								
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max		Mean	SD	Count	Min/Max
TOC	3.1	0.1	3	3.0 - 3.2	3.0	0.1	3	2.9 - 3.0	Res (0)	1.07	0.28	30	0.28 - 1.59
pH	8.1	0.0	3	8.1 - 8.1	8.1	0.1	3	8.1 - 8.3	Temp	13.2	1.3	30	11.4 - 15.4
UV254	0.037	0.002	3	0.035 - 0.039	0.034	0.003	3	0.031 - 0.036	pH	8.9	0.1	30	8.7 - 9.5
SUVA	1.20	0.03	3	1.17 - 1.22	1.15	0.07	3	1.07 - 1.20	Time	95.9	0.4	30	94.5 - 96.0
Bromide	54	0	1	54 - 54	50	9	2	45 - 54	Comments:				
SDS-TOX	210	17	3	200 - 230	203	25	3	180 - 230					
SDS-THM4	76	6	3	72 - 84	71	4	3	66 - 74					
SDS-HAA6	37	1	3	36 - 38	36	2	3	34 - 38					
Effluent	10 Min EBCT (8 B-S days)				20 Min EBCT (17 B-S days)				Chart Legend:				
Effluent pH	8.2	0.1	12	8.0 - 8.4	8.1	0.2	12	7.9 - 8.7					
Effluent Temp	13.4	0.3	12	13.0 - 13.8	13.1	1.4	12	10.9 - 16.3					

## Water Quality Graphs



## Water Quality Graphs (Continued)



## ICR Information

ID / ICR#: CA0110005 / 139  
 ICR Contact: Maria W. Tikkanen  
 Phone No.: 510-287-1561  
 Period: 2/2/99 - 2/26/99 (24 B-S days)

## Design Information

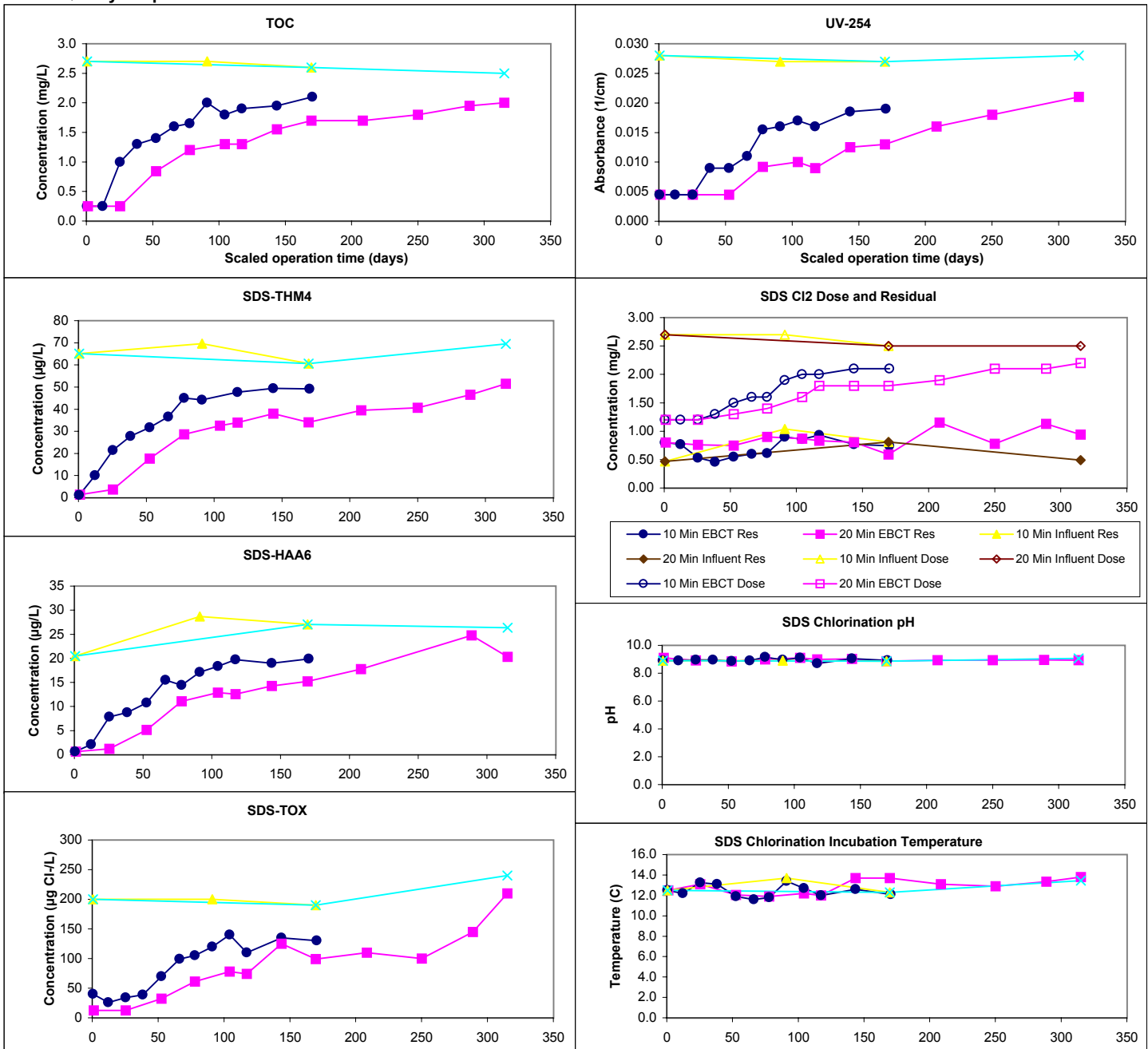
Design TOC: 2.6 mg/L  
 Col Diameter: 15.0 mm  
 Min Reynolds#: 0.50  
 Full-Scale Temp: 10.0 C

Full-Scale GAC Size: 8x30 bituminous  
 Bench-Scale GAC Size: 100x200  
 Scaling Factor: 13.16  
 Meas Dry Bed Density: 0.50 g/cm3

## Water Quality Summary

Influent	10 Min Influent				20 Min Influent				<div>Res (0)    <u>Mean</u>    <u>SD</u>    <u>Count</u>    <u>Min/Max</u></div> <div>Temp    12.7    0.7    30    11.6 - 13.8</div> <div>pH    8.9    0.1    30    8.7 - 9.2</div> <div>Time    96.7    2.5    30    94.5 - 109.0</div> <div>Comments:</div>				
	<u>Mean</u>	<u>SD/RD</u>	<u>Count</u>	<u>Min/Max</u>	<u>Mean</u>	<u>SD/RD</u>	<u>Count</u>	<u>Min/Max</u>					
TOC	2.7	0.1	3	2.6 - 2.7	2.6	0.1	3	2.5 - 2.7					
pH	8.0	0.0	3	8.0 - 8.1	8.1	0.1	3	8.0 - 8.2					
UV254	0.027	0.001	3	0.027 - 0.028	0.028	0.001	3	0.027 - 0.028					
SUVA	1.03	0.02	3	1.00 - 1.04	1.07	0.05	3	1.04 - 1.12					
Bromide	37	2	2	36 - 38	39	5	2	36 - 41					
SDS-TOX	197	6	3	190 - 200	210	26	3	190 - 240					
SDS-THM4	65	5	3	61 - 70	65	4	3	61 - 70					
SDS-HAA6	25	4	3	20 - 29	25	4	3	20 - 27					
<b>Effluent</b>	<b>10 Min EBCT</b> (13 B-S days)				<b>20 Min EBCT</b> (24 B-S days)				<b>Chart Legend:</b> <div><div><div></div><div>10 Min EBCT</div></div><div><div></div><div>20 Min EBCT</div></div><div><div></div><div>10 Min Influent</div></div><div><div></div><div>20 Min Influent</div></div></div>				
Effluent pH	8.0	0.1	12	7.8 - 8.2	8.1	0.2	12	7.9 - 8.5					
Effluent Temp	12.3	0.7	12	11.5 - 14.1	12.7	0.7	12	11.7 - 14.1					

## Water Quality Graphs



## Water Quality Graphs (Continued)

