

ICR TREATMENT STUDY ANALYSIS

Base Analysis and Data Review Comments

Treatment Study ID	1064
Study Protocol	GAC RSSCT treatment study
Plant ICR Number	652
PWS Name	Abilene
City, State, Zip	Abilene, TX 79604

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

Major comments:

1. GAC effluent SDS-HAA breakthrough results are unusual throughout study - high levels of immediate breakthrough and in some cases fairly constant levels during the entire run time. SDS-MCAA levels very high throughout entire treatment study - usually about 50 µg/L in both influent and effluent. During some runs, most effluent levels were about equal to influent levels.
 - a. Quarter 1: For 10 minute EBCT run: immediate HAA breakthrough levels above influent concentrations; levels decrease over the course of the run (DCAA, TCAA, MBAA). The 20 minute EBCT run shows a breakthrough curve for SDS-DBAA, but other species do not show any clear trend.
 - b. Quarter 2: Effluent values for most HAA species measured at about 80-120% of influent values, and roughly constant throughout entire run - immediate breakthrough for all compounds at near influent levels.
 - c. Quarter 3: High immediate breakthrough levels for some species (TCAA, MBAA, MCAA), others show more typical breakthrough behavior (DBAA, BCAA) in 10 minute EBCT run. Similar results in 20 minute EBCT run.
 - d. Quarter 4: Most HAA species show immediate breakthrough at levels above those measured in the influent. Influent SDS-MCAA increases from 10 to 63 µg/L over the course of the 10 minute EBCT run.

General Comments:

Outlier Data:

Q1 6 outlier data points removed.

All HAA data changed to NCF due to problems detailed above.

Cell: A1

Comment: 1064-SAS.xls 2/13/00 19:32

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

Cell: C3

Comment: 1064-10-01 - Run 1 (BDCM) 2/13/00 19:09
Original value (CoefA0) = 0 New value = -0.3857
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D3

Comment: 1064-10-01 - Run 1 (BDCM) 2/13/00 19:09
Original value (CoefAf) = 0 New value = 14.5463
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E3

Comment: 1064-10-01 - Run 1 (BDCM) 2/13/00 19:09
Original value (CoefB) = 0 New value = 2246.6936
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F3

Comment: 1064-10-01 - Run 1 (BDCM) 2/13/00 19:09
Original value (CoefD) = 0 New value = 0.2001
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J3

Comment: 1064-10-01 - Run 1 (BDCM) 2/13/00 19:09
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C6

Comment: 1064-10-01 - Run 1 (CHCl3) 2/13/00 19:06
Original value (CoefA0) = 99999 New value = -0.1499
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: D6

Comment: 1064-10-01 - Run 1 (CHCl3) 2/13/00 19:06
Original value (CoefAf) = 99999 New value = 2.8327
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: E6

Comment: 1064-10-01 - Run 1 (CHCl3) 2/13/00 19:06
Original value (CoefB) = 99999 New value = 20.0022
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: F6

Comment: 1064-10-01 - Run 1 (CHCl3) 2/13/00 19:06
Original value (CoefD) = 99999 New value = 0.2022
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: J6

Comment: 1064-10-01 - Run 1 (CHCl3) 2/13/00 19:06
Original value (S) = 0 New value = -0.1179
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: C19

Comment: 1064-10-01 - Run 1 (THM4) 2/13/00 19:08
Original value (CoefA0) = 99999 New value = 0.8279
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D19

Comment: 1064-10-01 - Run 1 (THM4) 2/13/00 19:08
Original value (CoefAf) = 99999 New value = 105.857
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E19

Comment: 1064-10-01 - Run 1 (THM4) 2/13/00 19:08
Original value (CoefB) = 99999 New value = 3632.3984
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F19

Comment: 1064-10-01 - Run 1 (THM4) 2/13/00 19:08
Original value (CoefD) = 99999 New value = 0.2571
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J19

Comment: 1064-10-01 - Run 1 (THM4) 2/13/00 19:08
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C25

Comment: 1064-10-02 - Run 3 (BDCM) 2/13/00 19:13
Original value (CoefA0) = 0 New value = -1.3359
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D25

Comment: 1064-10-02 - Run 3 (BDCM) 2/13/00 19:13
Original value (CoefAf) = 0 New value = 1911.7148
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E25

Comment: 1064-10-02 - Run 3 (BDCM) 2/13/00 19:13
Original value (CoefB) = 0 New value = 3112.9338
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F25

Comment: 1064-10-02 - Run 3 (BDCM) 2/13/00 19:13
Original value (CoefD) = 0 New value = 0.0466
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J25

Comment: 1064-10-02 - Run 3 (BDCM) 2/13/00 19:13
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C28

Comment: 1064-10-02 - Run 3 (CHCl3) 2/13/00 19:11
Original value (CoefA0) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: D28

Comment: 1064-10-02 - Run 3 (CHCl3) 2/13/00 19:11
Original value (CoefAf) = 0 New value = 3.6
Fewer than 6 points above MRL. Step function applied.

Cell: E28

Comment: 1064-10-02 - Run 3 (CHCl3) 2/13/00 19:11
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F28

Comment: 1064-10-02 - Run 3 (CHCl3) 2/13/00 19:11
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J28

Comment: 1064-10-02 - Run 3 (CHCl3) 2/13/00 19:11
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: C47

Comment: 1064-10-03 - Run 5 (BDCM) 2/13/00 19:16
Original value (CoefA0) = 0.6419 New value = -0.5656
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: D47

Comment: 1064-10-03 - Run 5 (BDCM) 2/13/00 19:16
Original value (CoefAf) = 11.625 New value = 1262.1792
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: E47

Comment: 1064-10-03 - Run 5 (BDCM) 2/13/00 19:16
Original value (CoefB) = 36.6059 New value = 1134.3613
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: F47

Comment: 1064-10-03 - Run 5 (BDCM) 2/13/00 19:16
Original value (CoefD) = 0.1171 New value = 0.0656
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: J47

Comment: 1064-10-03 - Run 5 (BDCM) 2/13/00 19:16

Original value (S) = 0 New value = -0.0883
Poor peak curve fit. Data was refit by iterative curve fit procedure.

Cell: C50

Comment: 1064-10-03 - Run 5 (CHCl3) 2/13/00 19:14
Original value (CoefA0) = 0 New value = -0.4517
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D50

Comment: 1064-10-03 - Run 5 (CHCl3) 2/13/00 19:14
Original value (CoefAf) = 0 New value = 20.3759
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E50

Comment: 1064-10-03 - Run 5 (CHCl3) 2/13/00 19:14
Original value (CoefB) = 0 New value = 9.9475
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F50

Comment: 1064-10-03 - Run 5 (CHCl3) 2/13/00 19:14
Original value (CoefD) = 0 New value = 0.0209
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J50

Comment: 1064-10-03 - Run 5 (CHCl3) 2/13/00 19:14
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C72

Comment: 1064-10-04 - Run 7 (CHCl3) 2/13/00 19:20
Original value (CoefA0) = 0 New value = 1.2134
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: D72

Comment: 1064-10-04 - Run 7 (CHCl3) 2/13/00 19:20
Original value (CoefAf) = 0 New value = 314.0971
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: E72

Comment: 1064-10-04 - Run 7 (CHCl3) 2/13/00 19:20
Original value (CoefB) = 0 New value = 589.6296
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: F72

Comment: 1064-10-04 - Run 7 (CHCl3) 2/13/00 19:20
Original value (CoefD) = 0 New value = 0.3755
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: J72

Comment: 1064-10-04 - Run 7 (CHCl3) 2/13/00 19:20
Original value (S) = 0 New value = -0.206

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

Cell: C88

Comment: 1064-10-04 - Run 7 (TSUVA) 2/13/00 19:19

Original value (CoefA0) = -1.1188 New value = -0.1154

Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

Cell: D88

Comment: 1064-10-04 - Run 7 (TSUVA) 2/13/00 19:19

Original value (CoefAf) = 3.1793 New value = 1.8611

Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

Cell: E88

Comment: 1064-10-04 - Run 7 (TSUVA) 2/13/00 19:19

Original value (CoefB) = 1.3658 New value = 19.7949

Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

Cell: F88

Comment: 1064-10-04 - Run 7 (TSUVA) 2/13/00 19:19

Original value (CoefD) = 0.1401 New value = 0.5013

Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

Cell: J88

Comment: 1064-10-04 - Run 7 (TSUVA) 2/13/00 19:19

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: C91

Comment: 1064-20-01 - Run 2 (BDCM) 2/13/00 19:10

Original value (CoefA0) = 0 New value = -0.4179

Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D91

Comment: 1064-20-01 - Run 2 (BDCM) 2/13/00 19:10

Original value (CoefAf) = 0 New value = 13.6247

Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E91

Comment: 1064-20-01 - Run 2 (BDCM) 2/13/00 19:10

Original value (CoefB) = 0 New value = 9.7106

Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F91

Comment: 1064-20-01 - Run 2 (BDCM) 2/13/00 19:10

Original value (CoefD) = 0 New value = 0.0144

Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J91

Comment: 1064-20-01 - Run 2 (BDCM) 2/13/00 19:10

Original value (S) = 0 New value = 0

Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C135

Comment: 1064-20-03 - Run 6 (BDCM) 2/13/00 19:18
Original value (CoefA0) = 0 New value = -1.5894
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: D135

Comment: 1064-20-03 - Run 6 (BDCM) 2/13/00 19:18
Original value (CoefAf) = 0 New value = 179.7982
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: E135

Comment: 1064-20-03 - Run 6 (BDCM) 2/13/00 19:18
Original value (CoefB) = 0 New value = 246.5034
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: F135

Comment: 1064-20-03 - Run 6 (BDCM) 2/13/00 19:18
Original value (CoefD) = 0 New value = 0.1053
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: J135

Comment: 1064-20-03 - Run 6 (BDCM) 2/13/00 19:18
Original value (S) = 0 New value = -0.0887
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: C154

Comment: 1064-20-03 - Run 6 (TSUVA) 2/13/00 19:16
Original value (CoefA0) = 0 New value = -0.1528
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

Cell: D154

Comment: 1064-20-03 - Run 6 (TSUVA) 2/13/00 19:16
Original value (CoefAf) = 1.563 New value = 1.3751
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

Cell: E154

Comment: 1064-20-03 - Run 6 (TSUVA) 2/13/00 19:16
Original value (CoefB) = 10 New value = 19.9884
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

Cell: F154

Comment: 1064-20-03 - Run 6 (TSUVA) 2/13/00 19:16
Original value (CoefD) = 0.15 New value = 1.6771
Peak curve fit with S = 0. Refit to type 1 curve fit by iterative curve fit procedure.

Cell: J154

Comment: 1064-20-03 - Run 6 (TSUVA) 2/13/00 19:16
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: C157

Comment: 1064-20-04 - Run 8 (BDCM) 2/13/00 19:21
Original value (CoefA0) = 0 New value = -0.895
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D157

Comment: 1064-20-04 - Run 8 (BDCM) 2/13/00 19:21
Original value (CoefAf) = 0 New value = 22.8859
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E157

Comment: 1064-20-04 - Run 8 (BDCM) 2/13/00 19:21
Original value (CoefB) = 0 New value = 80.4039
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F157

Comment: 1064-20-04 - Run 8 (BDCM) 2/13/00 19:21
Original value (CoefD) = 0 New value = 0.0405
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J157

Comment: 1064-20-04 - Run 8 (BDCM) 2/13/00 19:21
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C160

Comment: 1064-20-04 - Run 8 (CHCl3) 2/13/00 19:04
Original value (CoefA0) = 0 New value = 3.442
Fewer than 6 points above MRL. Step function applied.

Cell: D160

Comment: 1064-20-04 - Run 8 (CHCl3) 2/13/00 19:04
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: E160

Comment: 1064-20-04 - Run 8 (CHCl3) 2/13/00 19:04
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F160

Comment: 1064-20-04 - Run 8 (CHCl3) 2/13/00 19:04
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J160

Comment: 1064-20-04 - Run 8 (CHCl3) 2/13/00 19:04
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: K160

Comment: 1064-20-04 - Run 8 (CHCl3) 2/13/00 19:04

Original value (t0) = 0 New value = 8.3593
Fewer than 6 points above MRL. Step function applied.

ICR Information

ID / ICR#: TX2210001 / 652
 ICR Contact: Larry Bailey
 Phone No.: (915) 676-6041
 Period: 4/6/98 - 4/17/98 (10 B-S days)

Design Information

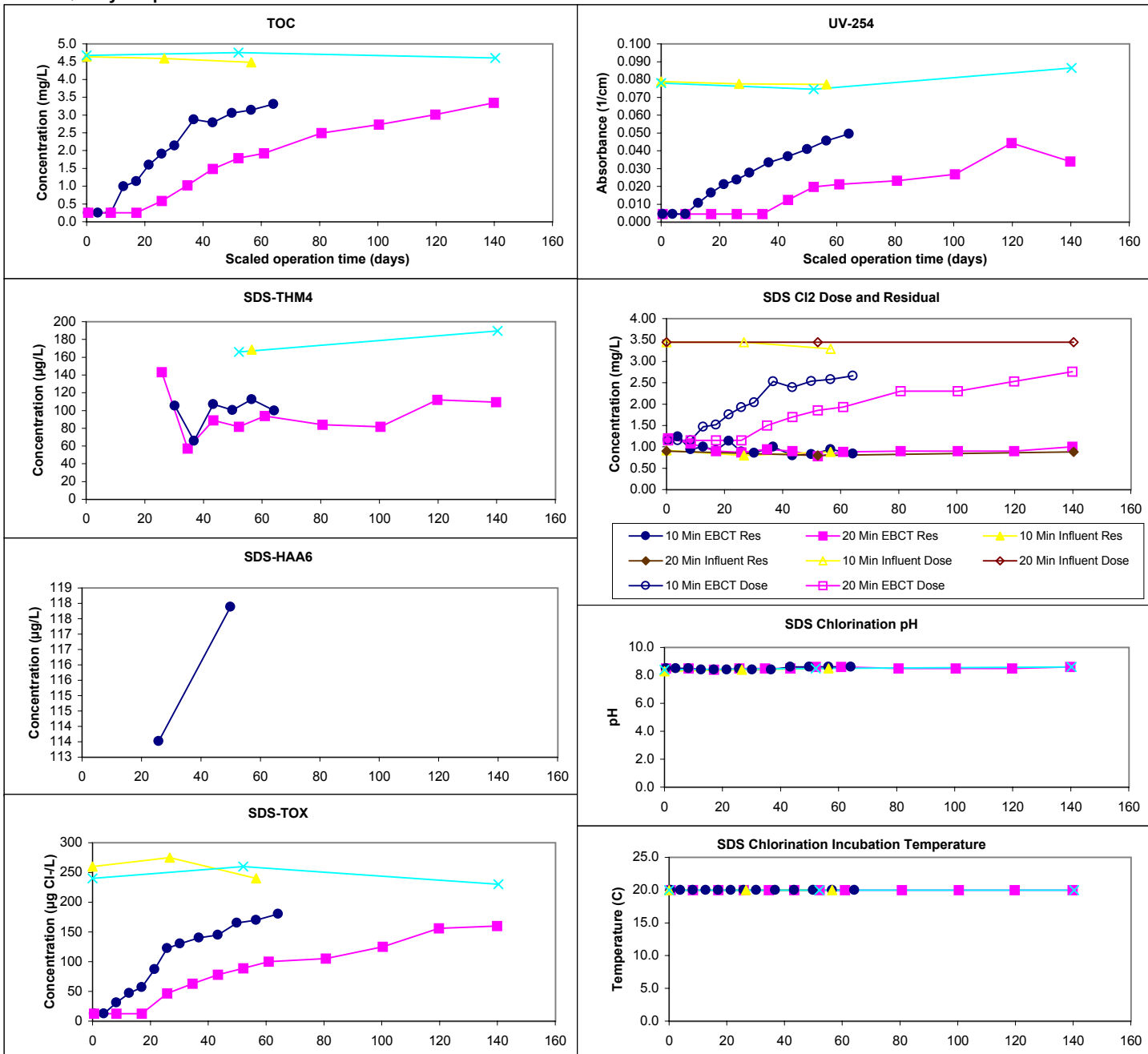
Design TOC: 4.5 mg/L
 Col Diameter: 15.0 mm
 Min Reynolds#: 0.49
 Full-Scale Temp: 19.0 C

Full-Scale GAC Size: 8x30 Bituminus coal
 Bench-Scale GAC Size: 100x200
 Scaling Factor: 13.16
 Meas Dry Bed Density: 0.46 g/cm3

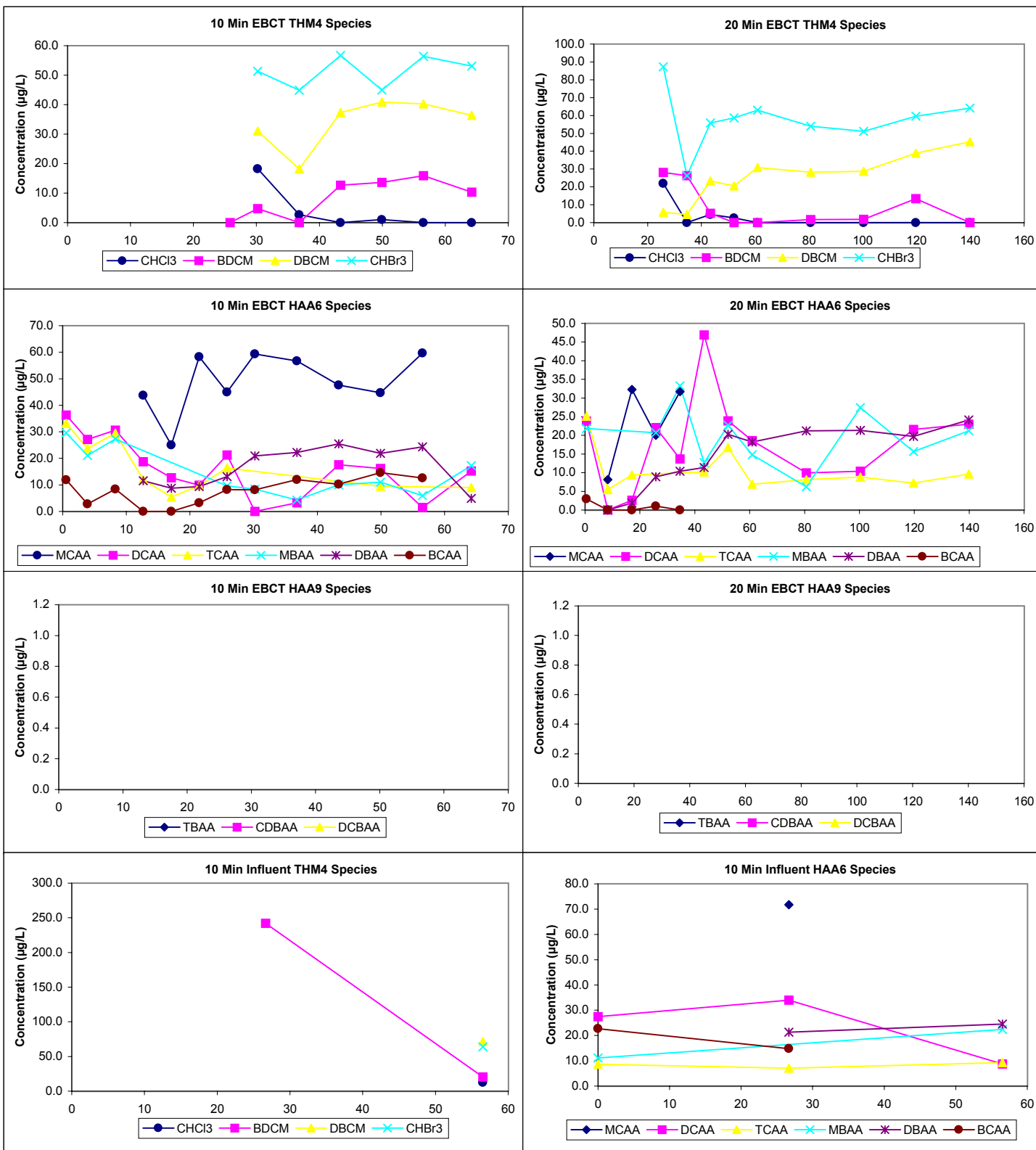
Water Quality Summary

Influent	10 Min Influent				20 Min Influent				Cumulative SDS Conditions			
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max	Mean	SD	Count	Min/Max
TOC	4.6	0.1	3	4.5 - 4.6	4.7	0.1	3	4.6 - 4.8	Res (0)	0.94	0.12	31 0.78 - 1.24
pH	8.1	0.1	3	7.9 - 8.2	8.2	0.2	3	8.0 - 8.3	Temp	20.0	0.0	31 20.0 - 20.0
UV254	0.078	0.001	3	0.077 - 0.079	0.080	0.006	3	0.075 - 0.087	pH	8.5	0.1	31 8.3 - 8.6
SUVA	1.70	0.02	3	1.69 - 1.72	1.71	0.16	3	1.57 - 1.88	Time	23.7	0.5	31 23.0 - 24.7
Bromide	435	10	2	430 - 440	440	0	2	440 - 440	Comments:			
SDS-TOX	258	18	3	240 - 275	243	15	3	230 - 260				
SDS-THM4	169	0	1	169 - 169	178	24	2	166 - 190	Chart Legend:			
SDS-HAA6	NA	0	0	0 - 0	NA	0	0	0 - 0				
Effluent	10 Min EBCT (5 B-S days)				20 Min EBCT (11 B-S days)				10 Min EBCT 20 Min EBCT 10 Min Influent 20 Min Influent			
Effluent pH	8.3	0.1	13	8.2 - 8.4	8.3	0.1	12	8.1 - 8.5				
Effluent Temp	20.7	0.7	13	19.5 - 21.9	21.1	0.8	12	19.7 - 22.0				

Water Quality Graphs



Water Quality Graphs (Continued)



ICR Information

ID / ICR#: TX2210001 / 652
 ICR Contact: Larry Bailey
 Phone No.: (915) 676-6041
 Period: 6/12/98 - 6/25/98 (12 B-S days)

Design Information

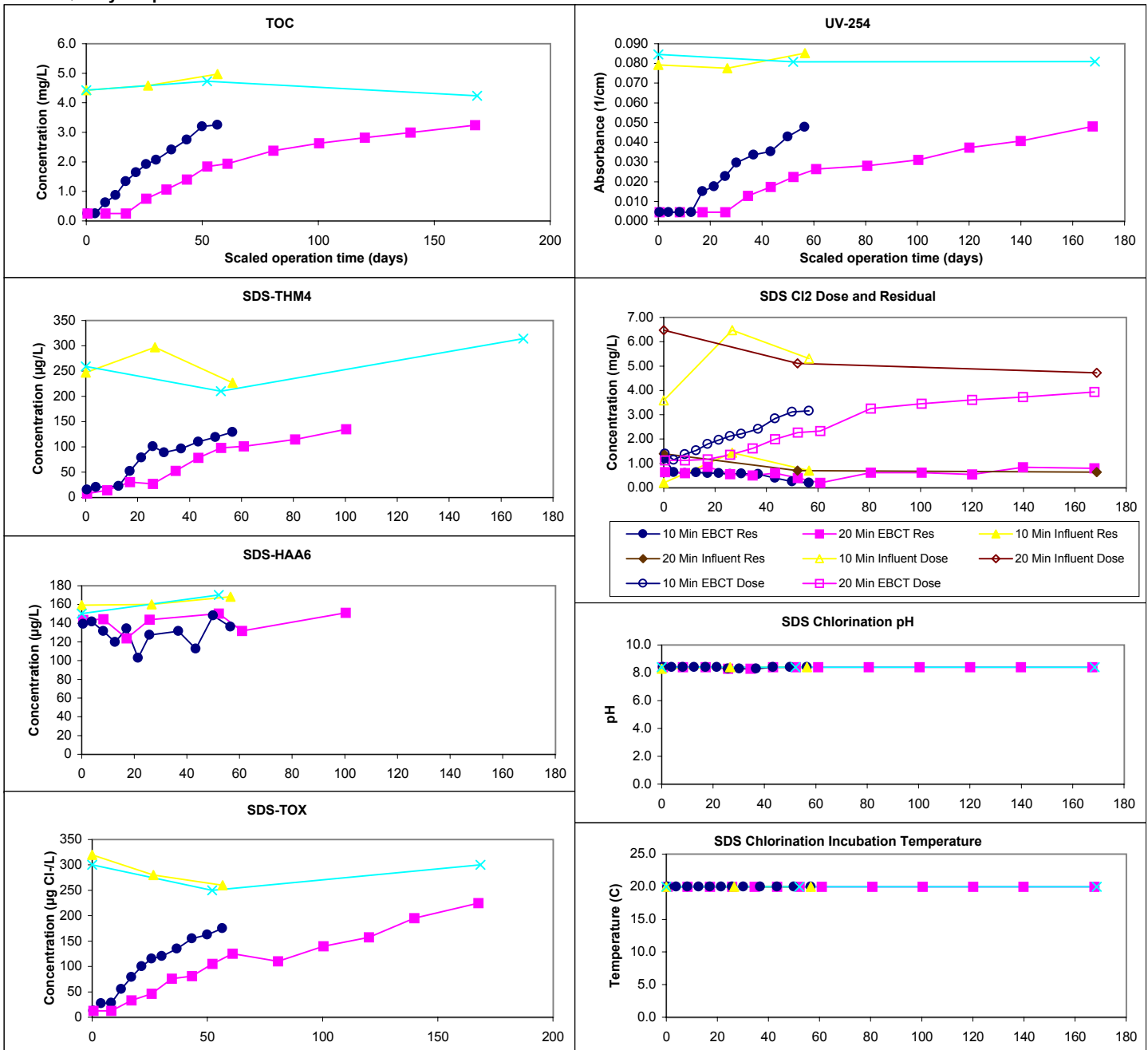
Design TOC: 4.5 mg/L
 Col Diameter: 15.0 mm
 Min Reynolds#: 0.58
 Full-Scale Temp: 26.0 C

Full-Scale GAC Size: 8x30 Bituminus coal
 Bench-Scale GAC Size: 100x200
 Scaling Factor: 13.16
 Meas Dry Bed Density: 0.46 g/cm3

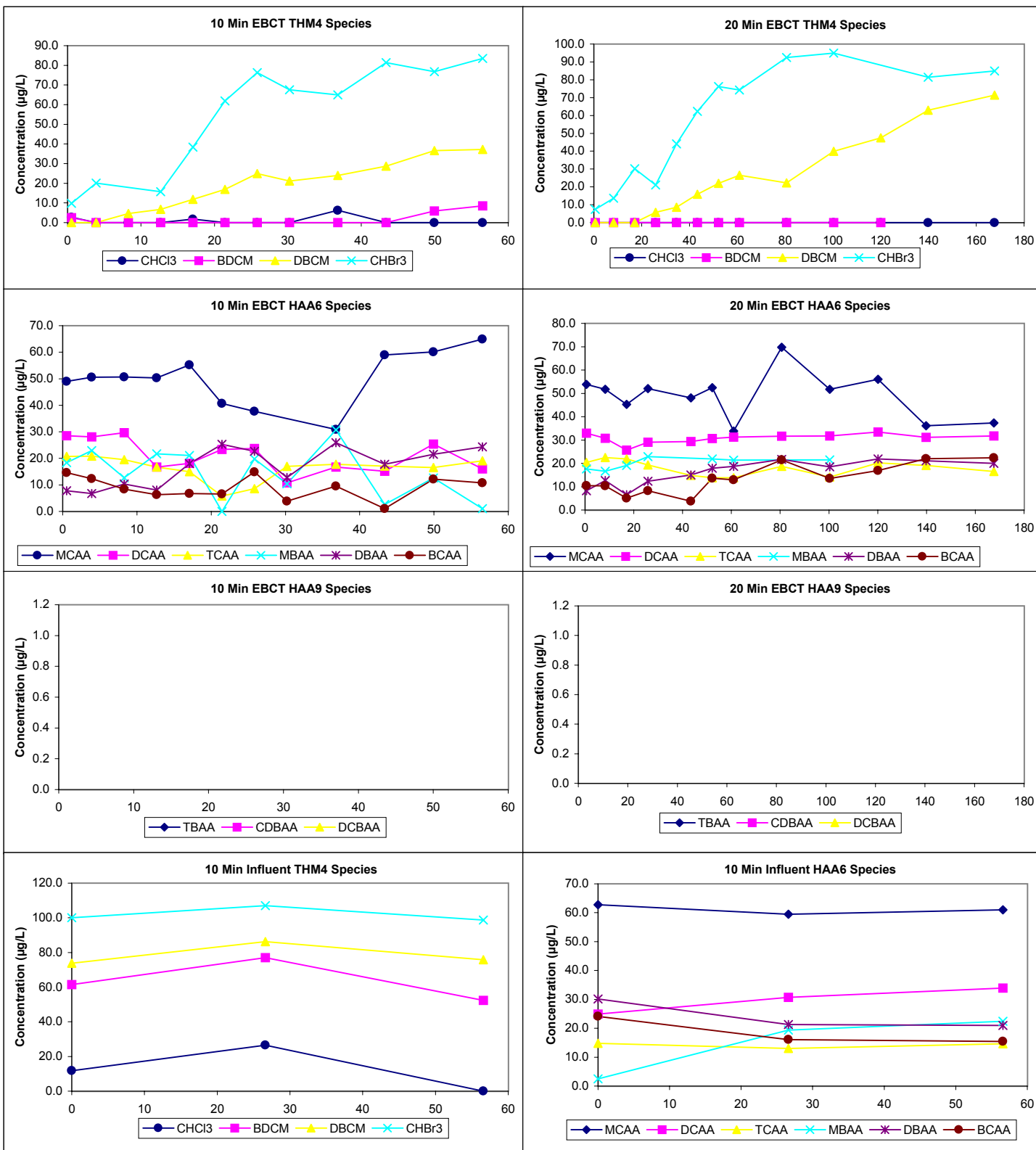
Water Quality Summary

Influent	10 Min Influent				20 Min Influent				Cumulative SDS Conditions			
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max	Res (0)	Mean	SD	Count
TOC	4.7	0.3	3	4.4 - 5.0	4.5	0.2	3	4.2 - 4.7	0.64	0.29		31
pH	8.0	0.1	3	7.9 - 8.1	8.1	0.1	3	8.0 - 8.2	Temp	20.0	0.0	31
UV254	0.081	0.004	3	0.078 - 0.085	0.082	0.002	3	0.081 - 0.085	pH	8.4	0.0	31
SUVA	1.73	0.05	3	1.69 - 1.79	1.84	0.12	3	1.71 - 1.91	Time	24.1	0.4	31
Bromide	445	10	2	440 - 450	460	0	2	460 - 460	Comments:			
SDS-TOX	287	31	3	260 - 320	283	29	3	250 - 300				
SDS-THM4	257	36	3	227 - 297	261	52	3	210 - 314	Chart Legend:			
SDS-HAA6	163	5	3	159 - 168	160	20	2	150 - 170				
Effluent	10 Min EBCT				20 Min EBCT				Chart Legend:			
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max				
Effluent pH	8.1	0.1	12	8.0 - 8.2	8.2	0.1	13	8.0 - 8.3	● 10 Min EBCT	■ 20 Min EBCT	▲ 10 Min Influent	× 20 Min Influent
Effluent Temp	22.1	0.6	12	21.1 - 23.4	22.0	0.8	13	20.8 - 23.6				

Water Quality Graphs



Water Quality Graphs (Continued)



ICR Information

ID / ICR#: TX2210001 / 652
 ICR Contact: Larry Bailey
 Phone No.: (915) 676-6041
 Period: 11/9/98 - 11/12/98 (3 B-S days)

Design Information

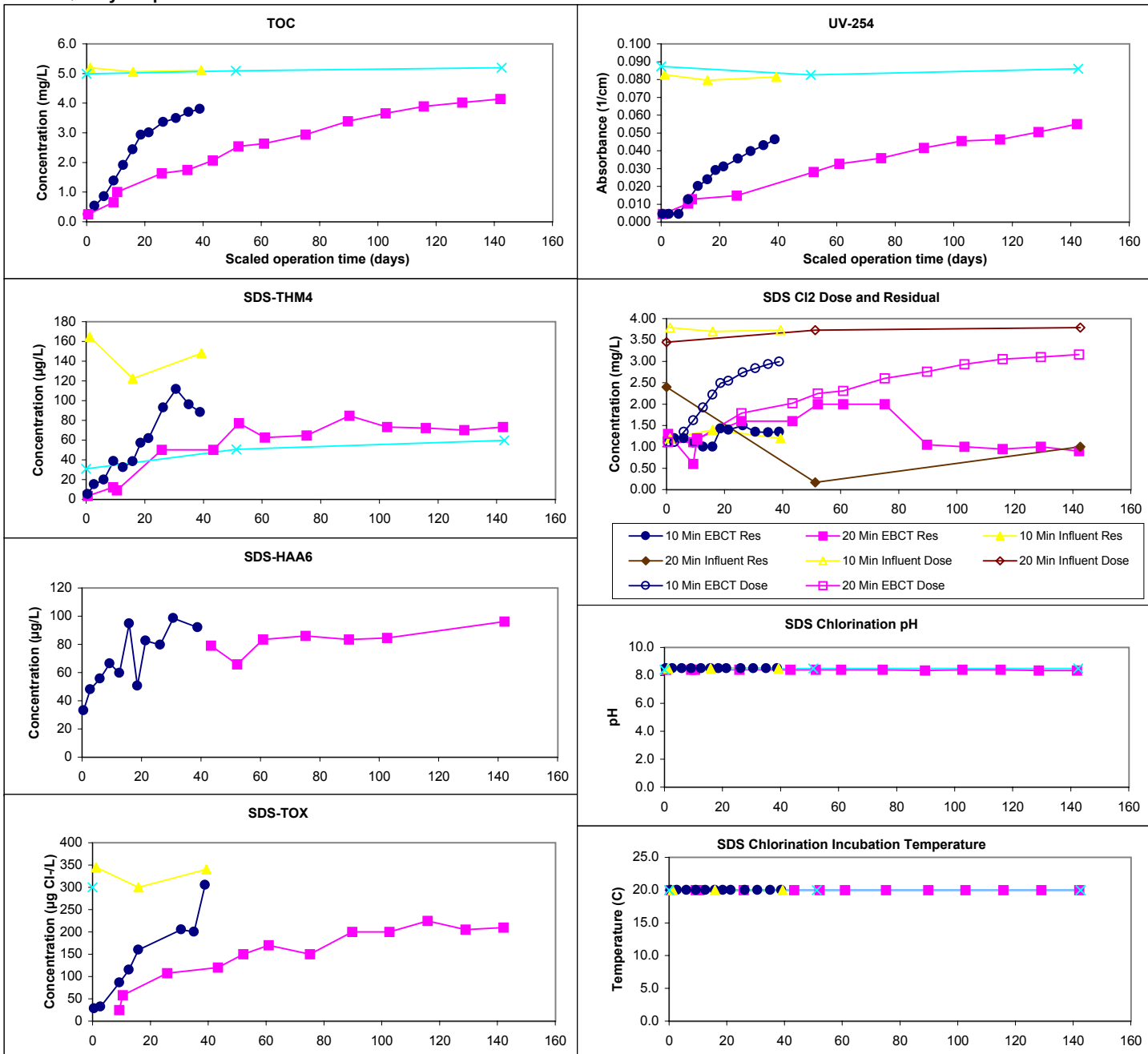
Design TOC: 4.5 mg/L
 Col Diameter: 15.0 mm
 Min Reynolds#: 0.45
 Full-Scale Temp: 16.0 C

Full-Scale GAC Size: 8x30 Bituminus coal
 Bench-Scale GAC Size: 100x200
 Scaling Factor: 13.16
 Meas Dry Bed Density: 0.46 g/cm3

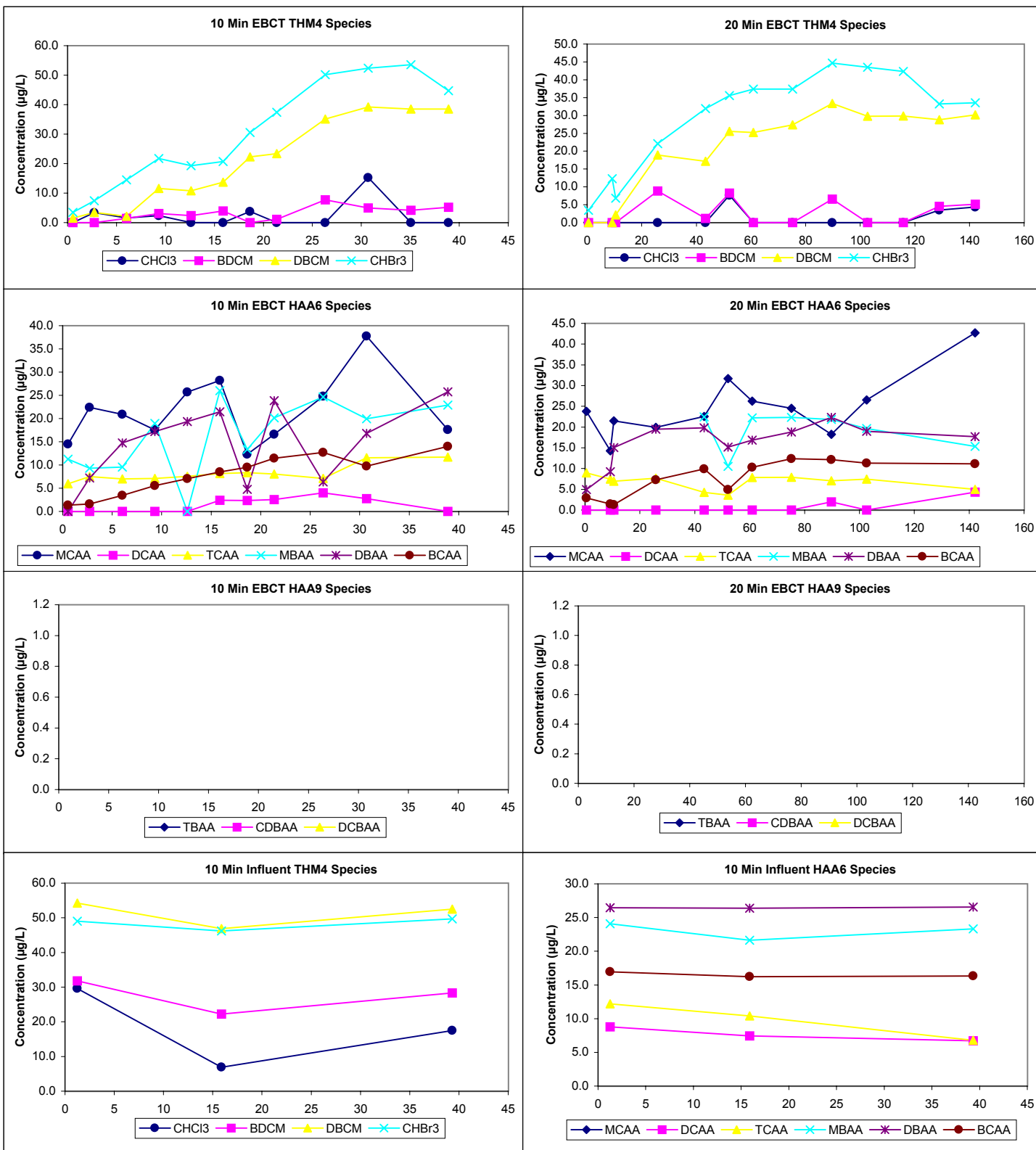
Water Quality Summary

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	5.1	0.1	3	5.1 - 5.2	5.1	0.1	3	5.0 - 5.2	Temp	1.28	0.43	31	0.17 - 2.40	
pH	8.2	0.0	3	8.1 - 8.2	8.1	0.1	3	8.0 - 8.2	pH	20.0	0.0	31	20.0 - 20.0	
UV254	0.081	0.002	3	0.080 - 0.083	0.085	0.002	3	0.083 - 0.087	Time	8.5	0.1	31	8.4 - 8.5	
SUVA	1.59	0.01	3	1.57 - 1.59	1.68	0.07	3	1.62 - 1.75		23.5	0.6	31	22.8 - 24.7	
Bromide	630	20	2	620 - 640	625	10	2	620 - 630	Comments:					
SDS-TOX	328	25	3	300 - 345	300	0	1	300 - 300						
SDS-THM4	145	21	3	122 - 165	47	15	3	31 - 60	Chart Legend:					
SDS-HAA6	NA	0	0	0 - 0	NA	0	0	0 - 0						
Effluent	10 Min EBCT (3 B-S days)				20 Min EBCT (11 B-S days)				Effluent pH	Effluent Temp	10 Min EBCT	20 Min EBCT	10 Min Influent	20 Min Influent
	8.2	0.0	12	8.2 - 8.3	8.2	0.1	13	8.0 - 8.4						
	20.5	0.6	12	19.4 - 21.7	20.7	0.9	13	19.7 - 22.5						

Water Quality Graphs



Water Quality Graphs (Continued)



ICR Information

ID / ICR#: TX2210001 / 652
 ICR Contact: Larry Bailey
 Phone No.: (915) 676-6041
 Period: 1/19/99 - 1/28/99 (9 B-S days)

Design Information

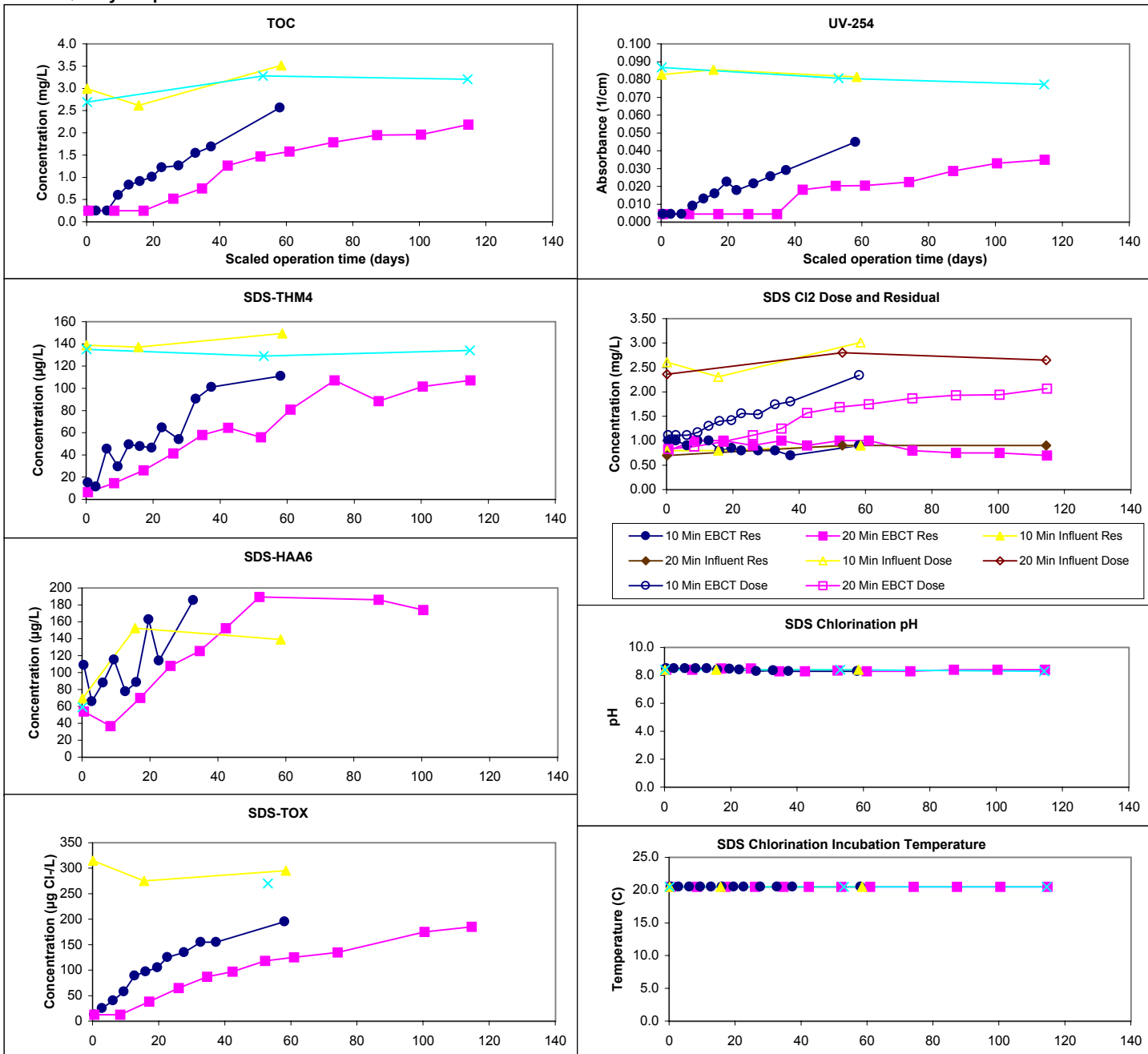
Design TOC: 4.5 mg/L
 Col Diameter: 15.0 mm
 Min Reynolds#: 0.39
 Full-Scale Temp: 10.0 C

Full-Scale GAC Size: 8x30 Bituminus coal
 Bench-Scale GAC Size: 100x200
 Scaling Factor: 13.16
 Meas Dry Bed Density: 0.46 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	0.5	3	2.6 - 3.5	3.1	0.3	3	2.7 - 3.3		0.87	0.10	30	0.70 - 1.00
pH	7.9	0.2	3	7.7 - 8.1	7.9	0.1	3	7.9 - 8.0	Temp	20.5	0.0	30	20.5 - 20.5
UV254	0.083	0.002	3	0.082 - 0.086	0.082	0.005	3	0.077 - 0.087	pH	8.4	0.1	30	8.3 - 8.5
SUVA	2.78	0.47	3	2.32 - 3.27	2.70	0.45	3	2.41 - 3.22	Time	23.3	0.3	30	22.7 - 23.8
Bromide	645	30	2	630 - 660	665	10	2	660 - 670	Comments:				
SDS-TOX	295	20	3	275 - 315	270	0	1	270 - 270					
SDS-THM4	142	7	3	137 - 149	133	3	3	129 - 135					
SDS-HAA6	120	45	3	69 - 152	59	0	1	59 - 59	<div><div></div>10 Min EBCT</div> <div><div></div>20 Min EBCT</div> <div><div></div>10 Min Influent</div> <div><div></div>20 Min Influent</div>				
Effluent	10 Min EBCT (4 B-S days)				20 Min EBCT (9 B-S days)								
Effluent pH	8.0	0.1	12	8.0 - 8.2	8.1	0.1	12	8.0 - 8.2					
Effluent Temp	21.4	0.4	12	20.9 - 22.0	20.8	0.4	12	20.3 - 21.5	Chart Legend:				

Water Quality Graphs



Water Quality Graphs (Continued)

