

ICR TREATMENT STUDY ANALYSIS

Base Analysis and Data Review Comments

Treatment Study ID	1077
Study Protocol	GAC pilot-scale treatment study
Plant ICR Number	323
PWS Name	Savannah Water System
City, State, Zip	Savannah, GA 31406

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

Major comments:

1. Rapid TOC breakthrough occurred during the 10 minute EBCT run, resulting in 75 percent TOC breakthrough after 15 days of operation (for the remaining three samples, representing 23 to 44 days of operation, the percent breakthrough ranged from 58 to 69 percent). This is unusual, given the low influent TOC concentration (average = 1.4 mg/L) and influent pH (average = 6.5). A total of only five effluent samples were taken. Although GAC influent levels were low, effluent SDS-TTHM and SDS-HAA6 exceeded concentrations formed in the influent to GAC after 44 days of operation. (GAC influent SDS-THM4 averaged 14 µg/L, while GAC influent SDS-HAA6 averaged 22 µg/L.) GAC effluent SDS-TOX levels during the 10 minute EBCT run matched or exceeded those formed in the influent after only 15 days of operation. Influent SDS-TOX ranged between 130 and 160 µg/L as Cl⁻. Note that the rapid breakthrough of TOC and DBP precursors was not observed during the 20 minute EBCT run.
2. Figure 3 indicates that the portion of the columns containing GAC would be of acrylic plexiglass construction. However, a design change was made, and PVC was used instead. As noted in the Summary Report Appendix, a TOC leach test was performed on a section of PVC with a 10 minute EBCT, and an average increase in TOC concentration of 0.26 mg/L was observed for samples taken over 6 days of operation. A wide variability in results were obtained; the standard deviation of the TOC change after contact with PVC was ± 0.33 mg/L. Although the average net increase in TOC concentration was relatively low, it represents a 19 percent of the average influent TOC concentration measured during the treatment study. If a factor during the treatment study experimental phase, TOC leaching may have contributed to rapid TOC breakthrough. Furthermore, since PVC is 57% chloride, any PVC that is leached and reaches the GAC effluent may contribute to TOX measurements, resulting in artificially high effluent measured "SDS-TOX." Assuming the average increase in TOC concentration observed during the leach test (0.26 mg/L) was due to PVC leaching, and that leaching

continued at this rate throughout the treatment study, a potential average 380 µg/L as Cl⁻ leaching exists. This may be a possible explanation for the extremely high breakthrough of SDS-TOX observed during the 10 minute EBCT run, which reached a concentration of 220 µg/L as Cl⁻, while an average SDS-TOX of 147 µg/L as Cl⁻ was measured in the GAC influent. During the 20 minute EBCT run, GAC effluent SDS-TOX reached influent levels.

General Comments:

1. The Summary Report indicates that SDS chlorination pH was 7.2 ± 0.2 . However, the average SDS chlorination pH used during the treatment study according to the Data Collection Spreadsheets was 6.1 (range: 5.9 to 6.6). After full-scale treatment, the plant adds lime to the water to increase the pH to an average value of 7.0, according to Table 2 in the Summary Report. An ambient incubation pH was likely used during SDS chlorination. The use of a lower incubation pH may impact DBP formation and speciation relative to plant distribution system DBP formation.
2. Due to an algae accumulation problem in the sand filter media (pilot filters on-line prior to GAC), plant finished water, which contained chlorine, was used to backwash the sand filters.
3. Due to excessive headloss, the study design hydraulic loading rate of 2.5 gpm/ft² was reduced to 1.43 gpm/ft². The GAC bed depth was also reduced so that the design EBCTs of 10 and 20 minutes remained constant.

Outlier Data:

One outlier removed.

Cell: A1**Comment:** 1077-SAS.xls 2/18/00 16:21

For run 1077-20-01, BL_B and BL_D were adjusted for all parameters, from the B and D values for TOC to the B and D values for TOX. Upon modeling the horizontal TOC breakthrough (all values were BMRL) errors occurred on application of the blended contactor algorithm in the database.

1077-SAS.xls 2/13/00 14:18

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

Cell: C2

Comment: 1077-10-01 - Run 1 (BCAA) 2/13/00 14:06
Original value (CoefA0) = 99999 New value = 0.66
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D2

Comment: 1077-10-01 - Run 1 (BCAA) 2/13/00 14:06
Original value (CoefAf) = 99999 New value = 3.5458
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E2

Comment: 1077-10-01 - Run 1 (BCAA) 2/13/00 14:06
Original value (CoefB) = 99999 New value = 20.0916
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F2

Comment: 1077-10-01 - Run 1 (BCAA) 2/13/00 14:06
Original value (CoefD) = 99999 New value = 0.0863
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J2

Comment: 1077-10-01 - Run 1 (BCAA) 2/13/00 14:06
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C3

Comment: 1077-10-01 - Run 1 (BDCM) 2/13/00 14:09
Original value (CoefA0) = 99999 New value = 1.428
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D3

Comment: 1077-10-01 - Run 1 (BDCM) 2/13/00 14:09
Original value (CoefAf) = 99999 New value = 9.5347
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E3

Comment: 1077-10-01 - Run 1 (BDCM) 2/13/00 14:09

Original value (CoefB) = 99999 New value = 22.3074
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F3

Comment: 1077-10-01 - Run 1 (BDCM) 2/13/00 14:09
Original value (CoefD) = 99999 New value = 0.0657
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J3

Comment: 1077-10-01 - Run 1 (BDCM) 2/13/00 14:09
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C5

Comment: 1077-10-01 - Run 1 (CHBr3) 2/13/00 13:55
Original value (CoefA0) = 99999 New value = 0
Fewer than 6 points. Step function applied.

Cell: D5

Comment: 1077-10-01 - Run 1 (CHBr3) 2/13/00 13:55
Original value (CoefAf) = 99999 New value = 0
Fewer than 6 points. Step function applied.

Cell: E5

Comment: 1077-10-01 - Run 1 (CHBr3) 2/13/00 13:55
Original value (CoefB) = 99999 New value = 0
Fewer than 6 points. Step function applied.

Cell: F5

Comment: 1077-10-01 - Run 1 (CHBr3) 2/13/00 13:55
Original value (CoefD) = 99999 New value = 0
Fewer than 6 points. Step function applied.

Cell: J5

Comment: 1077-10-01 - Run 1 (CHBr3) 2/13/00 13:55
Original value (S) = 0 New value = 0
Fewer than 6 points. Step function applied.

Cell: K5

Comment: 1077-10-01 - Run 1 (CHBr3) 2/13/00 13:55
Original value (t0) = 0 New value = 0
Fewer than 6 points. Step function applied.

Cell: C6

Comment: 1077-10-01 - Run 1 (CHCl3) 2/13/00 14:02
Original value (CoefA0) = 99999 New value = 1.5062
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D6

Comment: 1077-10-01 - Run 1 (CHCl3) 2/13/00 14:02
Original value (CoefAf) = 99999 New value = 568.0654

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

Cell: E6

Comment: 1077-10-01 - Run 1 (CHCl3) 2/13/00 14:02
Original value (CoefB) = 99999 New value = 604.353
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F6

Comment: 1077-10-01 - Run 1 (CHCl3) 2/13/00 14:02
Original value (CoefD) = 99999 New value = 0.0493
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J6

Comment: 1077-10-01 - Run 1 (CHCl3) 2/13/00 14:02
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C7

Comment: 1077-10-01 - Run 1 (Cl2-D) 2/13/00 14:08
Original value (CoefA0) = 99999 New value = 0.8485
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: D7

Comment: 1077-10-01 - Run 1 (Cl2-D) 2/13/00 14:08
Original value (CoefAf) = 99999 New value = 0.9445
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: E7

Comment: 1077-10-01 - Run 1 (Cl2-D) 2/13/00 14:08
Original value (CoefB) = 99999 New value = 19.9981
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: F7

Comment: 1077-10-01 - Run 1 (Cl2-D) 2/13/00 14:08
Original value (CoefD) = 99999 New value = 0.1388
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: J7

Comment: 1077-10-01 - Run 1 (Cl2-D) 2/13/00 14:08
Original value (S) = 0 New value = -0.013
Fewer than 6 points above MRL. Data was fit to peak curve by iterative curve fit procedure.

Cell: C8

Comment: 1077-10-01 - Run 1 (DBAA) 2/13/00 13:56
Original value (CoefA0) = 99999 New value = 0
Fewer than 6 points. Step function applied.

Cell: D8

Comment: 1077-10-01 - Run 1 (DBAA) 2/13/00 13:56
Original value (CoefAf) = 99999 New value = 0
Fewer than 6 points. Step function applied.

Cell: E8

Comment: 1077-10-01 - Run 1 (DBAA) 2/13/00 13:56
Original value (CoefB) = 99999 New value = 0
Fewer than 6 points. Step function applied.

Cell: F8

Comment: 1077-10-01 - Run 1 (DBAA) 2/13/00 13:56
Original value (CoefD) = 99999 New value = 0
Fewer than 6 points. Step function applied.

Cell: J8

Comment: 1077-10-01 - Run 1 (DBAA) 2/13/00 13:56
Original value (S) = 0 New value = 0
Fewer than 6 points. Step function applied.

Cell: K8

Comment: 1077-10-01 - Run 1 (DBAA) 2/13/00 13:56
Original value (t0) = 0 New value = 0
Fewer than 6 points. Step function applied.

Cell: C9

Comment: 1077-10-01 - Run 1 (DBCM) 2/13/00 14:03
Original value (CoefA0) = 99999 New value = -0.0641
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D9

Comment: 1077-10-01 - Run 1 (DBCM) 2/13/00 14:03
Original value (CoefAf) = 99999 New value = 2.1421
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E9

Comment: 1077-10-01 - Run 1 (DBCM) 2/13/00 14:03
Original value (CoefB) = 99999 New value = 519.1453
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F9

Comment: 1077-10-01 - Run 1 (DBCM) 2/13/00 14:03
Original value (CoefD) = 99999 New value = 0.275
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J9

Comment: 1077-10-01 - Run 1 (DBCM) 2/13/00 14:03
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C10

Comment: 1077-10-01 - Run 1 (DCAA) 2/13/00 14:05
Original value (CoefA0) = 99999 New value = 3.1728
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D10

Comment: 1077-10-01 - Run 1 (DCAA) 2/13/00 14:05
Original value (CoefAf) = 99999 New value = 11.812
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E10

Comment: 1077-10-01 - Run 1 (DCAA) 2/13/00 14:05
Original value (CoefB) = 99999 New value = 15.7274
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F10

Comment: 1077-10-01 - Run 1 (DCAA) 2/13/00 14:05
Original value (CoefD) = 99999 New value = 0.0708
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J10

Comment: 1077-10-01 - Run 1 (DCAA) 2/13/00 14:05
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C12

Comment: 1077-10-01 - Run 1 (HAA5) 2/13/00 14:07
Original value (CoefA0) = 99999 New value = 4.8082
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D12

Comment: 1077-10-01 - Run 1 (HAA5) 2/13/00 14:07
Original value (CoefAf) = 99999 New value = 43.1561
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E12

Comment: 1077-10-01 - Run 1 (HAA5) 2/13/00 14:07
Original value (CoefB) = 99999 New value = 30.5496
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F12

Comment: 1077-10-01 - Run 1 (HAA5) 2/13/00 14:07
Original value (CoefD) = 99999 New value = 0.0661
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J12

Comment: 1077-10-01 - Run 1 (HAA5) 2/13/00 14:07
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C13

Comment: 1077-10-01 - Run 1 (HAA6) 2/13/00 14:12
Original value (CoefA0) = 99999 New value = 5.7832
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D13

Comment: 1077-10-01 - Run 1 (HAA6) 2/13/00 14:12

Original value (CoefAf) = 99999 New value = 43.3081
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E13

Comment: 1077-10-01 - Run 1 (HAA6) 2/13/00 14:12
Original value (CoefB) = 99999 New value = 31.0603
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F13

Comment: 1077-10-01 - Run 1 (HAA6) 2/13/00 14:12
Original value (CoefD) = 99999 New value = 0.0713
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J13

Comment: 1077-10-01 - Run 1 (HAA6) 2/13/00 14:12
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C15

Comment: 1077-10-01 - Run 1 (MBAA) 2/13/00 13:52
Original value (CoefA0) = 99999 New value = 0
Fewer than 6 points above MRL. Step function applied.

1077-10-01 - Run 1 (MBAA) 2/13/00 13:53
Original value (CoefA0) = 0 New value = 0
Fewer than 6 points. Step function applied.

Cell: D15

Comment: 1077-10-01 - Run 1 (MBAA) 2/13/00 13:52
Original value (CoefAf) = 99999 New value = 0
Fewer than 6 points above MRL. Step function applied.

1077-10-01 - Run 1 (MBAA) 2/13/00 13:53
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points. Step function applied.

Cell: E15

Comment: 1077-10-01 - Run 1 (MBAA) 2/13/00 13:52
Original value (CoefB) = 99999 New value = 0
Fewer than 6 points above MRL. Step function applied.

1077-10-01 - Run 1 (MBAA) 2/13/00 13:53
Original value (CoefB) = 0 New value = 0
Fewer than 6 points. Step function applied.

Cell: F15

Comment: 1077-10-01 - Run 1 (MBAA) 2/13/00 13:52
Original value (CoefD) = 99999 New value = 0
Fewer than 6 points above MRL. Step function applied.

1077-10-01 - Run 1 (MBAA) 2/13/00 13:53

Original value (CoefD) = 0 New value = 0
Fewer than 6 points. Step function applied.

Cell: J15

Comment: 1077-10-01 - Run 1 (MBAA) 2/13/00 13:52
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

1077-10-01 - Run 1 (MBAA) 2/13/00 13:53
Original value (S) = 0 New value = 0
Fewer than 6 points. Step function applied.

Cell: K15

Comment: 1077-10-01 - Run 1 (MBAA) 2/13/00 13:52
Original value (t0) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

1077-10-01 - Run 1 (MBAA) 2/13/00 13:53
Original value (t0) = 0 New value = 0
Fewer than 6 points. Step function applied.

Cell: C16

Comment: 1077-10-01 - Run 1 (MCAA) 2/13/00 14:10
Original value (CoefA0) = 99999 New value = 0.3186
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D16

Comment: 1077-10-01 - Run 1 (MCAA) 2/13/00 14:10
Original value (CoefAf) = 99999 New value = 656.7712
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E16

Comment: 1077-10-01 - Run 1 (MCAA) 2/13/00 14:10
Original value (CoefB) = 99999 New value = 2824.0136
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F16

Comment: 1077-10-01 - Run 1 (MCAA) 2/13/00 14:10
Original value (CoefD) = 99999 New value = 0.0572
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J16

Comment: 1077-10-01 - Run 1 (MCAA) 2/13/00 14:10
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C18

Comment: 1077-10-01 - Run 1 (TCAA) 2/13/00 14:11
Original value (CoefA0) = 99999 New value = -5.4272
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D18

Comment: 1077-10-01 - Run 1 (TCAA) 2/13/00 14:11
Original value (CoefAf) = 99999 New value = 46.1384
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E18

Comment: 1077-10-01 - Run 1 (TCAA) 2/13/00 14:11
Original value (CoefB) = 99999 New value = 6.5086
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F18

Comment: 1077-10-01 - Run 1 (TCAA) 2/13/00 14:11
Original value (CoefD) = 99999 New value = 0.0208
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J18

Comment: 1077-10-01 - Run 1 (TCAA) 2/13/00 14:11
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C19

Comment: 1077-10-01 - Run 1 (THM4) 2/13/00 14:04
Original value (CoefA0) = 99999 New value = 3.8988
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D19

Comment: 1077-10-01 - Run 1 (THM4) 2/13/00 14:04
Original value (CoefAf) = 99999 New value = 104.6653
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E19

Comment: 1077-10-01 - Run 1 (THM4) 2/13/00 14:04
Original value (CoefB) = 99999 New value = 113.8146
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F19

Comment: 1077-10-01 - Run 1 (THM4) 2/13/00 14:04
Original value (CoefD) = 99999 New value = 0.0653
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J19

Comment: 1077-10-01 - Run 1 (THM4) 2/13/00 14:04
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C20

Comment: 1077-10-01 - Run 1 (TOC) 2/13/00 14:00
Original value (CoefA0) = 99999 New value = 0.1449
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D20

Comment: 1077-10-01 - Run 1 (TOC) 2/13/00 14:00
Original value (CoefAf) = 99999 New value = 0.9057
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E20

Comment: 1077-10-01 - Run 1 (TOC) 2/13/00 14:00
Original value (CoefB) = 99999 New value = 19.9213
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F20

Comment: 1077-10-01 - Run 1 (TOC) 2/13/00 14:00
Original value (CoefD) = 99999 New value = 0.9518
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J20

Comment: 1077-10-01 - Run 1 (TOC) 2/13/00 14:00
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C21

Comment: 1077-10-01 - Run 1 (TOX) 2/13/00 14:13
Original value (CoefA0) = 99999 New value = -281.6204
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D21

Comment: 1077-10-01 - Run 1 (TOX) 2/13/00 14:13
Original value (CoefAf) = 99999 New value = 508.1068
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E21

Comment: 1077-10-01 - Run 1 (TOX) 2/13/00 14:13
Original value (CoefB) = 99999 New value = 0.7373
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F21

Comment: 1077-10-01 - Run 1 (TOX) 2/13/00 14:13
Original value (CoefD) = 99999 New value = 0.0654
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J21

Comment: 1077-10-01 - Run 1 (TOX) 2/13/00 14:13
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C22

Comment: 1077-10-01 - Run 1 (TSUVA) 2/13/00 14:01
Original value (CoefA0) = 99999 New value = -0.1543
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D22

Comment: 1077-10-01 - Run 1 (TSUVA) 2/13/00 14:01

Original value (CoefAf) = 99999 New value = 3.5053
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E22

Comment: 1077-10-01 - Run 1 (TSUVA) 2/13/00 14:01
Original value (CoefB) = 99999 New value = 24.4482
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F22

Comment: 1077-10-01 - Run 1 (TSUVA) 2/13/00 14:01
Original value (CoefD) = 99999 New value = 0.2972
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J22

Comment: 1077-10-01 - Run 1 (TSUVA) 2/13/00 14:01
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C23

Comment: 1077-10-01 - Run 1 (UV254) 2/13/00 14:07
Original value (CoefA0) = 99999 New value = 0.0024
Fewer than 6 points. Logistic function (type 1) applied.

Cell: D23

Comment: 1077-10-01 - Run 1 (UV254) 2/13/00 14:07
Original value (CoefAf) = 99999 New value = 0.0308
Fewer than 6 points. Logistic function (type 1) applied.

Cell: E23

Comment: 1077-10-01 - Run 1 (UV254) 2/13/00 14:07
Original value (CoefB) = 99999 New value = 19.9992
Fewer than 6 points. Logistic function (type 1) applied.

Cell: F23

Comment: 1077-10-01 - Run 1 (UV254) 2/13/00 14:07
Original value (CoefD) = 99999 New value = 0.3364
Fewer than 6 points. Logistic function (type 1) applied.

Cell: J23

Comment: 1077-10-01 - Run 1 (UV254) 2/13/00 14:07
Original value (S) = 0 New value = 0
Fewer than 6 points. Logistic function (type 1) applied.

Cell: C91

Comment: 1077-20-01 - Run 2 (BDCM) 2/13/00 13:57
Original value (CoefA0) = 0 New value = 1.9333
Fewer than 6 points above MRL. Step function applied.

Cell: D91

Comment: 1077-20-01 - Run 2 (BDCM) 2/13/00 13:57
Original value (CoefAf) = 0 New value = 0

Fewer than 6 points above MRL. Step function applied.

Cell: E91

Comment: 1077-20-01 - Run 2 (BDCM) 2/13/00 13:57
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F91

Comment: 1077-20-01 - Run 2 (BDCM) 2/13/00 13:57
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J91

Comment: 1077-20-01 - Run 2 (BDCM) 2/13/00 13:57
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: K91

Comment: 1077-20-01 - Run 2 (BDCM) 2/13/00 13:57
Original value (t0) = 0 New value = 50.9514
Fewer than 6 points above MRL. Step function applied.

Cell: C97

Comment: 1077-20-01 - Run 2 (DBCM) 2/13/00 13:56
Original value (CoefA0) = 0 New value = 2.0333
Poor peak curve fit. Data was refit by iterative curve fit procedure.

1077-20-01 - Run 2 (DBCM) 2/13/00 13:56
Original value (CoefA0) = 2.0333 New value = 2.0333
Fewer than 6 points above MRL. Step function applied.

Cell: D97

Comment: 1077-20-01 - Run 2 (DBCM) 2/13/00 13:56
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: E97

Comment: 1077-20-01 - Run 2 (DBCM) 2/13/00 13:56
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F97

Comment: 1077-20-01 - Run 2 (DBCM) 2/13/00 13:56
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J97

Comment: 1077-20-01 - Run 2 (DBCM) 2/13/00 13:56
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: K97

Comment: 1077-20-01 - Run 2 (DBCM) 2/13/00 13:56
Original value (t0) = 0 New value = 50.9514
Fewer than 6 points above MRL. Step function applied.

Cell: C104

Comment: 1077-20-01 - Run 2 (MCAA) 2/13/00 13:57
Original value (CoefA0) = 0 New value = 2.2
Fewer than 6 points above MRL. Step function applied.

Cell: D104

Comment: 1077-20-01 - Run 2 (MCAA) 2/13/00 13:57
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: E104

Comment: 1077-20-01 - Run 2 (MCAA) 2/13/00 13:57
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F104

Comment: 1077-20-01 - Run 2 (MCAA) 2/13/00 13:57
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J104

Comment: 1077-20-01 - Run 2 (MCAA) 2/13/00 13:57
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: K104

Comment: 1077-20-01 - Run 2 (MCAA) 2/13/00 13:57
Original value (t0) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: C106

Comment: 1077-20-01 - Run 2 (TCAA) 2/13/00 14:15
Original value (CoefA0) = 0 New value = -1.018
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D106

Comment: 1077-20-01 - Run 2 (TCAA) 2/13/00 14:15
Original value (CoefAf) = 0 New value = 11.9384
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E106

Comment: 1077-20-01 - Run 2 (TCAA) 2/13/00 14:15
Original value (CoefB) = 0 New value = 4.7788
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F106

Comment: 1077-20-01 - Run 2 (TCAA) 2/13/00 14:15
Original value (CoefD) = 0 New value = 0.0183
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J106

Comment: 1077-20-01 - Run 2 (TCAA) 2/13/00 14:15
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

ICR Information

ID / ICR#: GA0510003 / 323
 ICR Contact: Tony Tucker
 Phone No.: (912)964-4473
 Period: 4/14/98 - 9/9/98 (148 days)

Design Information

Design TOC: 2.1 mg/L
 Col Diameter: 202.0 mm

Full-Scale GAC Size: 8x30 US Std Mesh
 Full-Scale particle dia.: 1.480 mm
 Meas Dry Bed Density: 352.0 kg/m3

Water Quality Summary

Influent	Mean	SD	Count	Min/Max
TOC	1.4	0.5	8	0.9 - 2.1
pH	6.5	0.2	8	6.1 - 6.9
UV254	0.056	0.030	8	0.037 - 0.130
SUVA	4.24	2.10	8	2.2 - 8.1
Bromide	23.25	15.81	8	0.0 - 44.0
SDS-TOX	147	10	6	130 - 160
SDS-THM4	14	4	7	7 - 18
SDS-HAA6	22	4	7	16 - 27
Ammonia	0.00	0.00	8	0.00 - 0.00

Cumulative SDS Conditions

	Mean	SD	Count	Min/Max
Res (1)	0.67	0.43	21	0.06 - 1.27
Temp	24.1	3.1	21	19.0 - 28.0
pH	6.1	0.2	21	5.9 - 6.6
Time	2.0	0.0	21	2.0 - 2.0

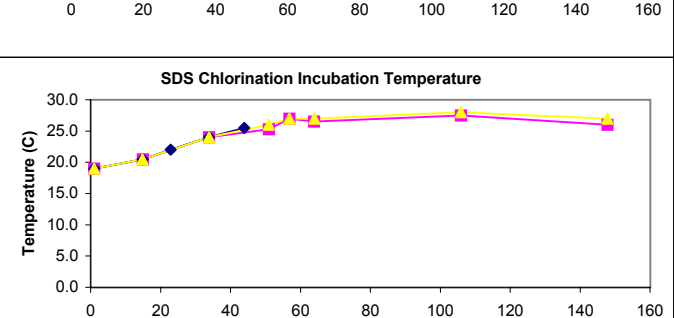
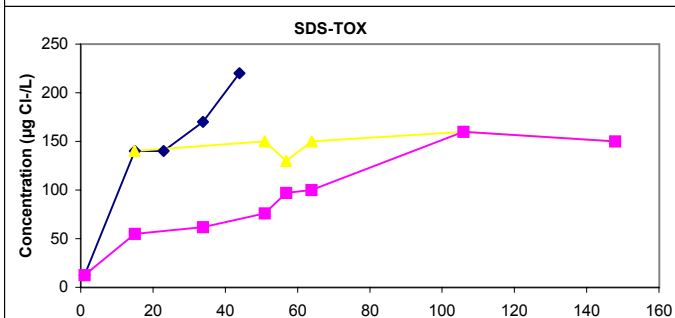
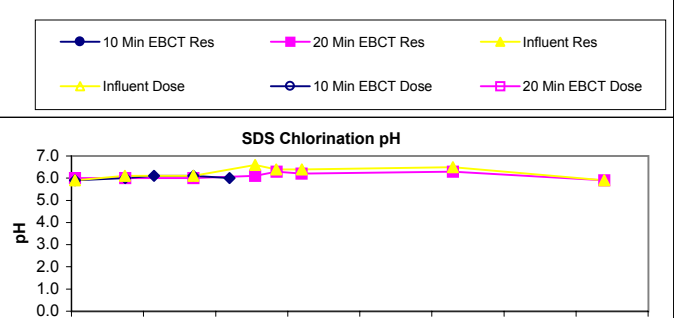
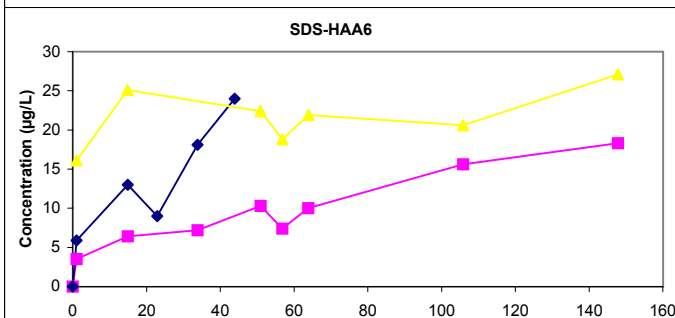
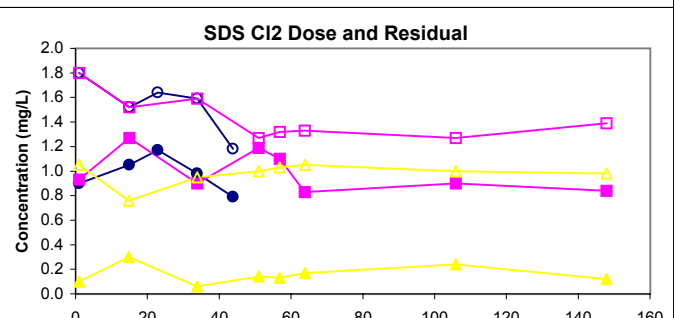
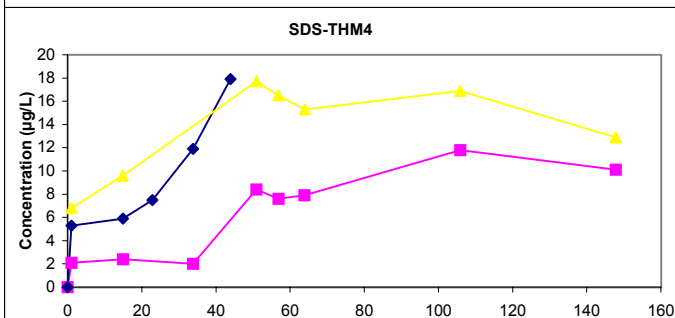
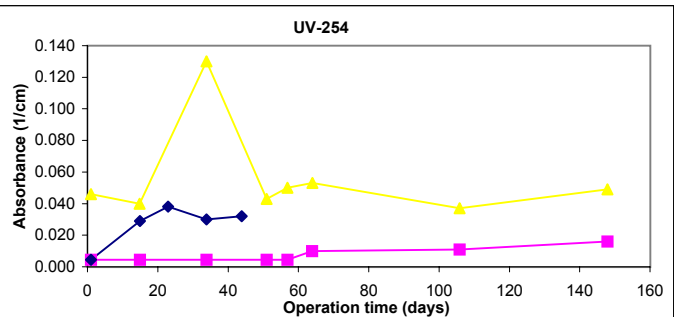
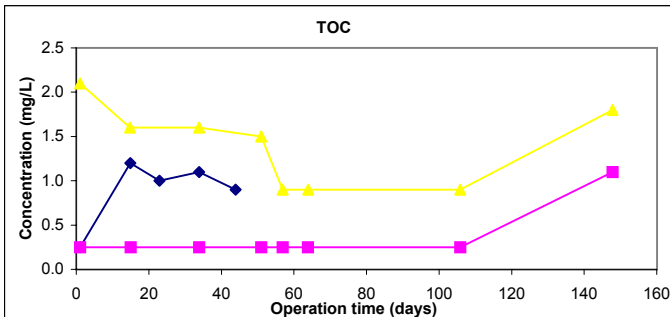
Comments:

Chart

Legend: 10 Min EBCT
 20 Min EBCT
 Influent

Effluent	10 Min EBCT	(44 days)	20 Min EBCT	(148 days)
Effluent pH	6.2	0.3	5	5.7 - 6.6
Effluent Temp	21.9	3.2	5	18.5 - 27.0
	6.2	0.2	8	6.0 - 6.5
	24.9	3.7	8	19.0 - 28.5

Water Quality Parameter Graphs



Water Quality Parameter Graphs (Continued)

