III. Long-Term Biochemical Oxygen Demand Measurements

Long-term biochemical oxygen demand (BOD) measurements were performed with water and trapped sediments collected from the DWSC and the San Joaquin River.

Materials and Methods

Selected water and sediment samples were placed in 300-mL BOD bottles without dilution or seeding. Measurements of dissolved oxygen were performed periodically over 40 days using a DO electrode and meter. Readings were periodically checked with a different meter and by the Winkler method (APHA *et al.,* 1998). When DO levels were measured below 4 or 5 mg/L, reaeration was accomplished by shaking the sample in a 4-L Erlenmeyer flask until saturation was achieved. One or two blanks and glucose-glutamic acid standards (with seed) were also included with each trial.

The kinetic rate decay constant and the ultimate BOD, L_0, was estimated by linearizing the data and fitting with a least-squares line. Assuming the decay of organic matter to behave as a first-order reaction,

$$BOD_t = L_0[1 - e^{-kt}]$$

where BOD_t is the biochemical oxygen demand calculated at time, t, in mg/L, k is the first-order decay rate constant, and L_0 is the ultimate BOD. Determination of k and L_0 is determined graphically by using the following linear approximation of the above equation:

$$\left[\frac{t}{y_t}\right]^{1/3} = (kL_0)^{-1/3} + \left[\frac{k^{2/3}}{6L_0^{1/3}}\right]t,$$

where $y_t = BOD_t$.

A plot of $\left[\frac{t}{y_t}\right]^{1/3}$ vs. *t* is a straight line with slope $m = \frac{1}{6}k^{2/3}L_0^{-1/3}$ and y-intercept of $b = (kL_0)^{-1/3}$. The first-order rate constant and ultimate BOD are calculated from k=6m/b and $L_0=1/(6mb^2)$.

Estimates of the decay constant and ultimate BOD

Examples of the BOD data are presented in Figures III-1 and III-2 for water collected from the San Joaquin River and the DWSC, respectively, for July 13, 2001 data. As shown in Figures III-1 and III-2, total BOD, carbonaceous BOD (CBOD), soluble BOD (sBOD), and soluble CBOD (sCBOD), were performed with San Joaquin River and DWSC water at selected stations and depths. The goodness of fit was evaluated by squared correlation coefficients (R^2) and visual inspection. Anomalous data points were selectively removed so as not to skew the fitted line. However, virtually all the k values were estimated with at least four data points. Experiments were often conducted for 30 days. The fitting parameters for the water and sediment samples are provided in Appendix D, Tables D-1 and D-2. The water BOD data were evaluated on a 5, 10, 20 day basis at 20°C. These calculations appear in Table D-1 along with the BOD_{ult}. The sediment demands were expressed on 10 day and ultimate basis in Table D-2.

Figure III-3 shows the results of the total BOD sediment and associated water tests. The sediment oxygen demand was determined by subtracting the water demand. Shown later the oxygen demand of the trapped sediments were calculated on a TSS, VSS, chlorophyll *a*, or chlorophyll *a* plus pheophytin *a* mass basis.

Figure III-4 presents the BOD_{10} results for water samples collected from the San Joaquin River and the DWSC for each monitoring run conducted from June through October. The BOD_{10} values were calculated from the fitted rate constant and the BOD_{ult} values shown in Table D-1. The highest BOD_{10} measurements observed in the San Joaquin River was 9.5 mg/L on the first monitoring day, June 14, 2001. The BOD_{10} usually remained above 7.5 mg/L through August and then exhibited a decreasing trend to a low of 3 mg/L measured on October 25, 2001. These data suggest that the BOD of water entering the DWSC is strongly influenced by the algae concentrations and productivity in the San Joaquin River above the DWSC.

The BOD_{10} values measured for the DWSC exhibited more variability than the San Joaquin River during the summer months, typically ranging between 4 and 9.5. The lowest BOD_{10} values measured for the DWSC were determined during the last monitoring run, conducted on October 25, 2001. Prior to October 25, the BOD measurements in the DWSC do not exhibit a clear temporal trend.

The fitted first-order rate constant at 20°C for the BOD experiments are plotted in Figure III-5 for the DWSC and the San Joaquin River at the USGS UVM station. The BOD for These data vary from 0.04 to 0.17 d^{-1} for individual experiments. The San Joaquin River data exhibit much less variability than the DWSC. The average decay constants for the San Joaquin River and the DWSC are shown in Table III-1. The $BOD_{uLt.}/BOD_5$ ratio was be determined from,

$$BOD_{ult} / BOD_5 = 1/(1 - e^{-k \times 5}),$$

Table III-1: Mean and standard deviation of the first-order BOD decay constants at 20°C.

Location	k at 20°C (d^{-1})	BODult/BOD_5

	mean	std. dev.	
	BOD / CBOD / NBOD	BOD / CBOD / NBOD	BOD / CBOD / NBOD
San Joaquin River	0.087 / 0.11 / 0.057	0.019 / 0.022 / 0.017	2.8 / 1.7 / 4.0
DWSC	0.094 / 0.11 / 0.076	0.034 / 0.023 / 0.038	2.7 / 1.7 / 3.2

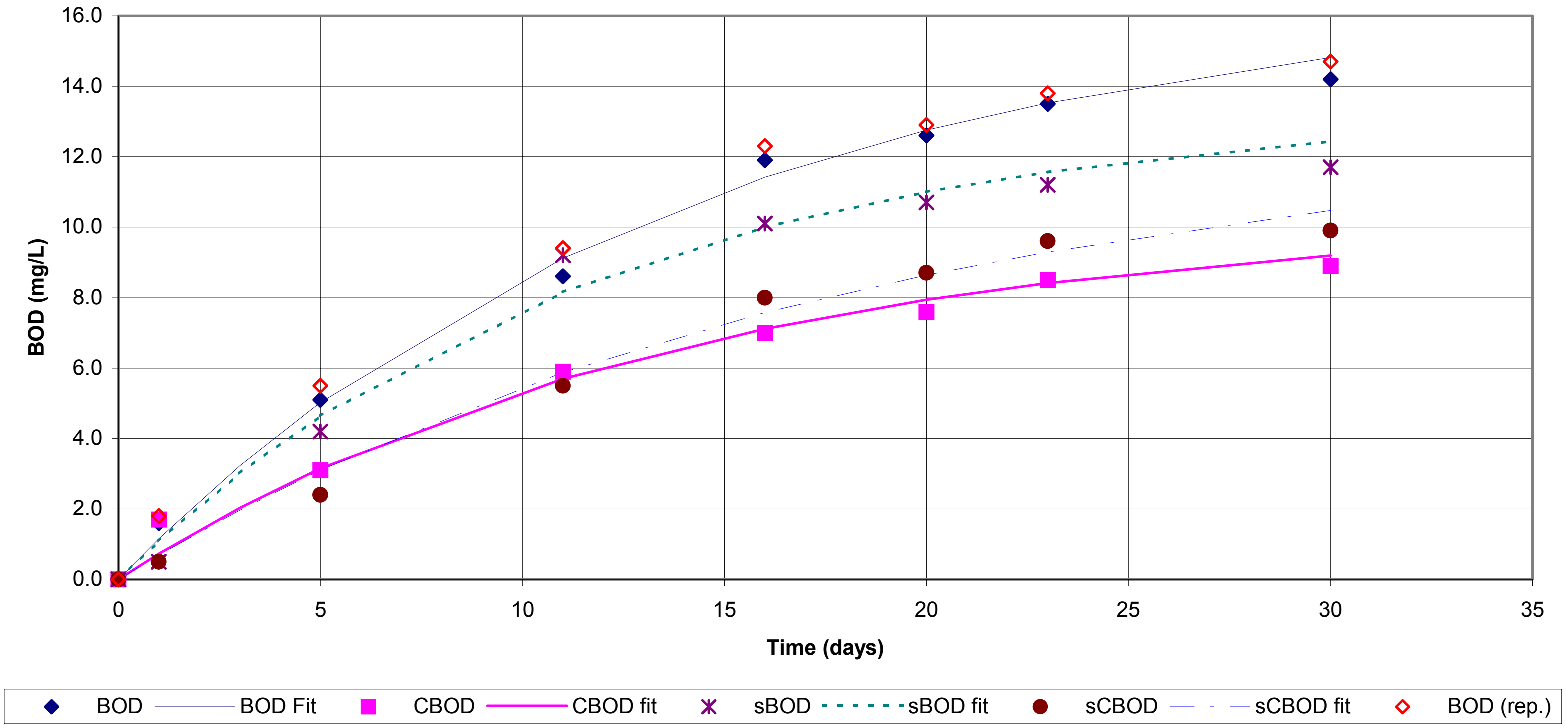

Figure III-1: Oxygen demand results and fitted curves for water collected from the San Joaquin River at the USGS UVM Station on July 13, 2001 during ebb tide.

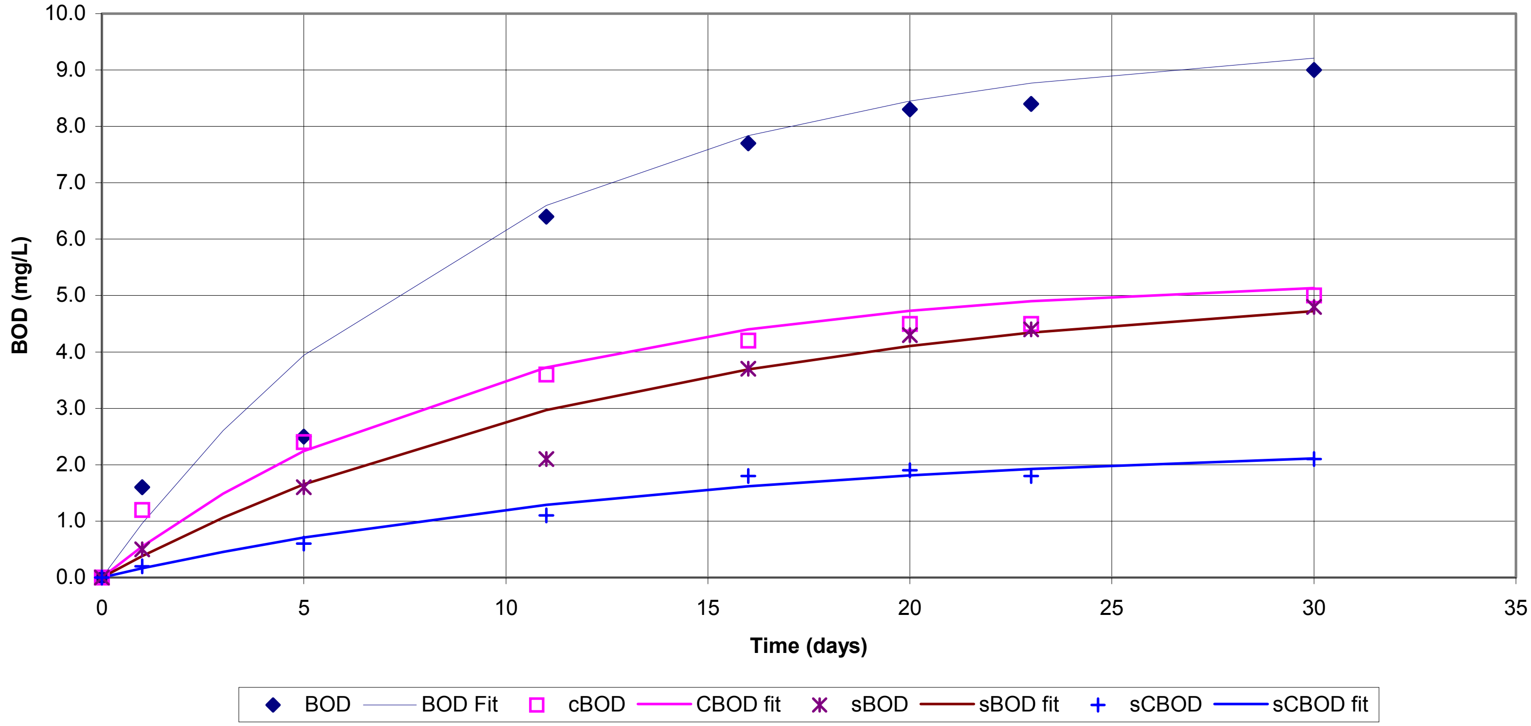

Figure III-2: Oxygen demand results and fitted curves for water collected from the Lt. 43 station on July 13, 2001 during ebb tide.

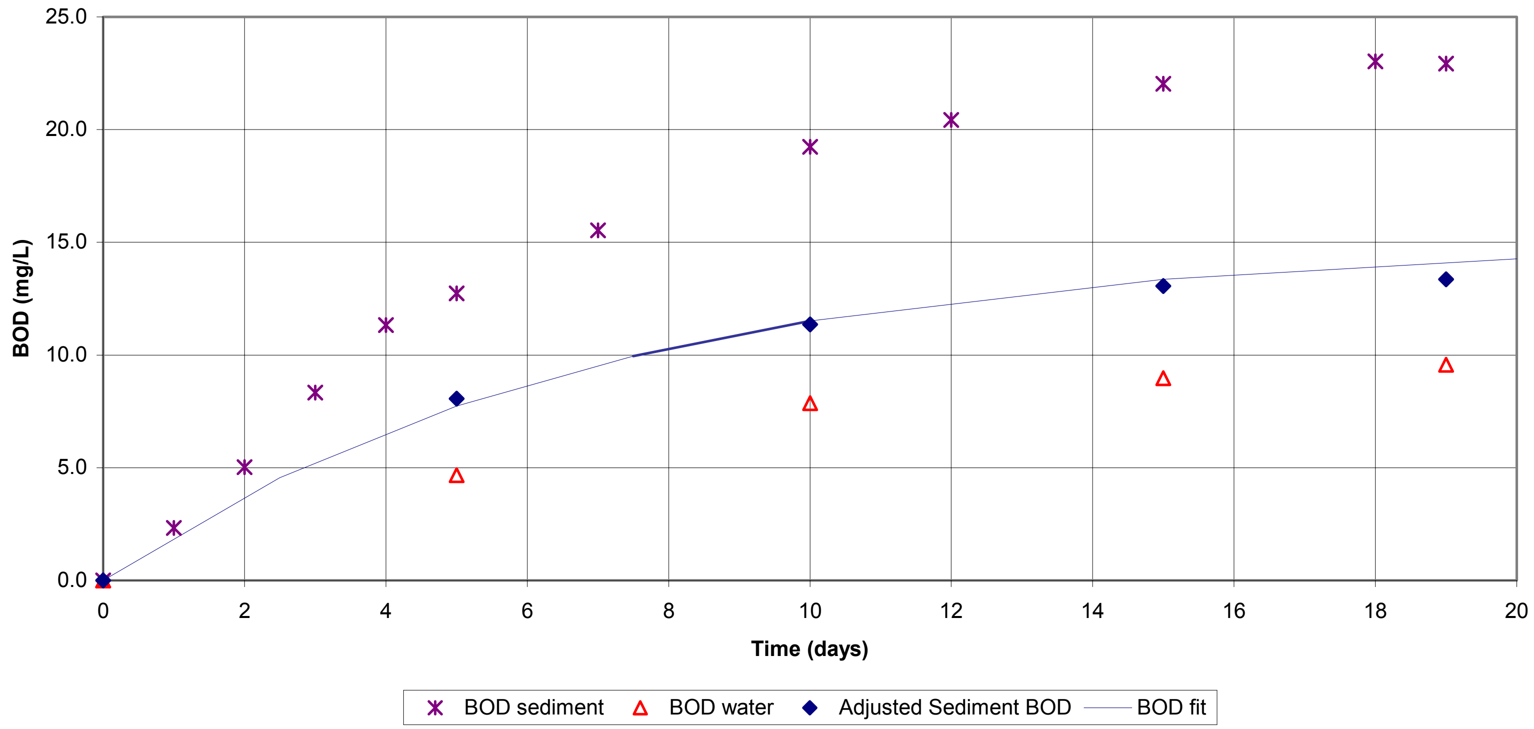

Figure III-3: Example of sediment and water oxygen demand data used to develop adjusted sediment data. Adjusted sediment data were obtained by subtracting the water BOD from the sediment BOD. Sediment and water samples were collected 2 feet above the sediment water interface at Lt. 48 on August 25, 2001.

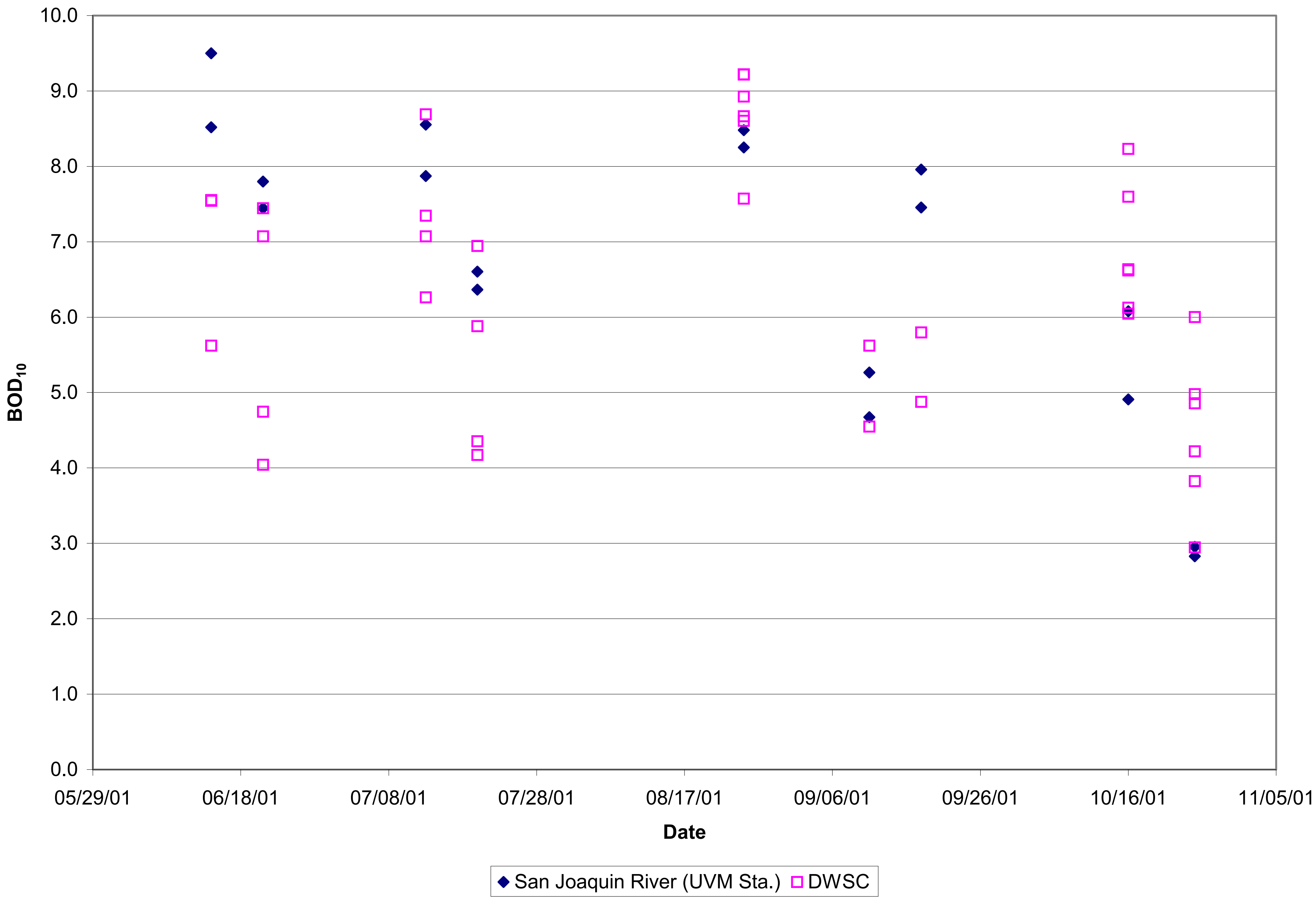

Figure III-4: Comparison of the BOD_{10} in the DWSC and entering the DWSC as measured at the USGS UVM Station on the San Joaquin River.

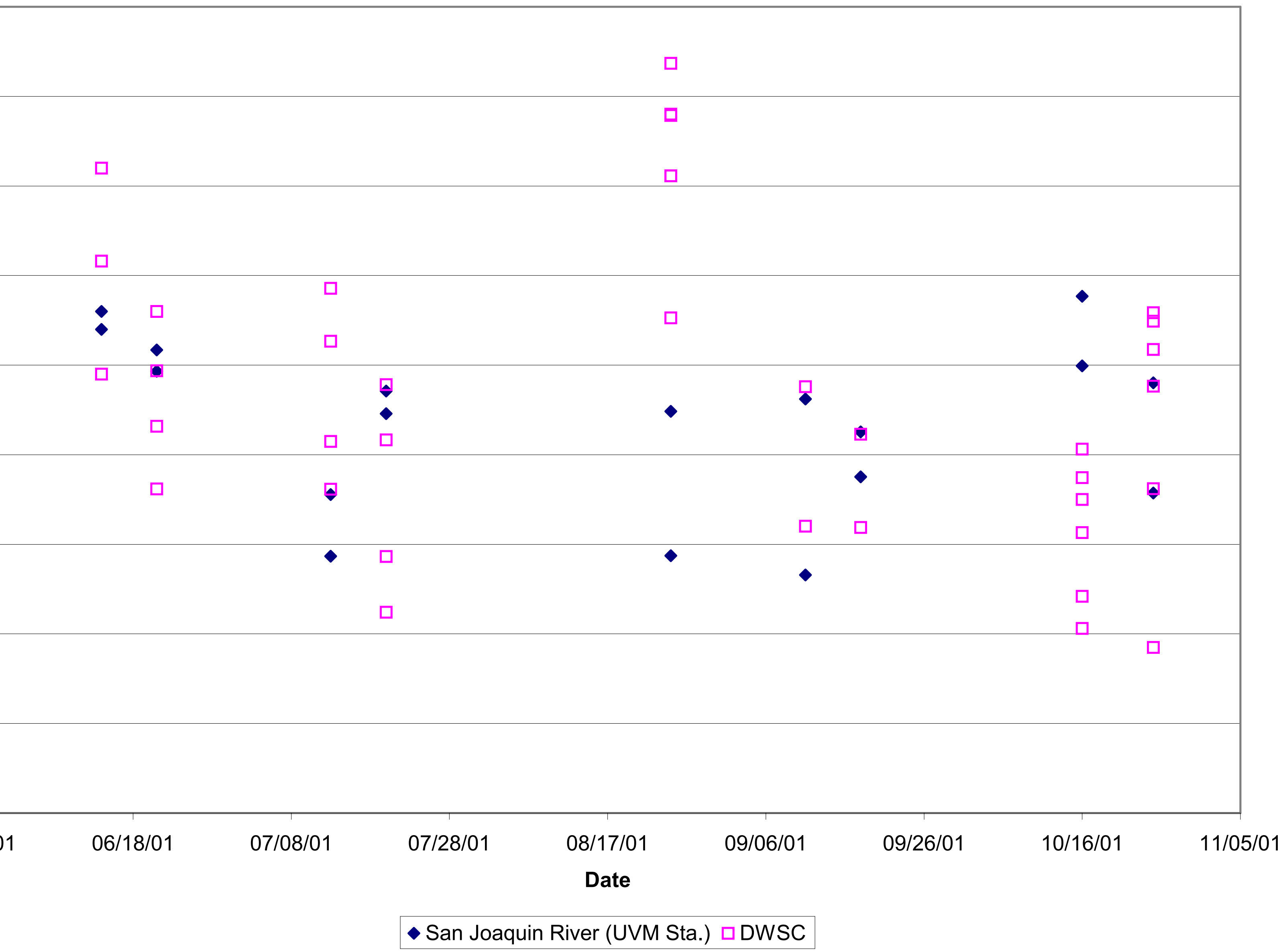

Figure III-5: Comparison of the BOD rate constant, k, in the DWSC and entering the DWSC as measured at the USGS UVM Station on the San Joaquin River.

Soluble, Particulate, Carbonaceous, and Nitrogenous BOD Fractions

The following BOD constituents were determined using 10 day values calculated with k and BOD_{ult} values determined by fitting a first-order equation to plots of

- Carbonaceous BOD (CBOD)
- Soluble BOD (sBOD)
- Soluble carbonaceous BOD (sCBOD)

Fractions of these constituents to the total BOD at 10 days were determined for the waters of the DWSC and the San Joaquin River by the linear fits shown in Figures III-7 through III-9. Note that several of the soluble tests were excluded from the average linear fits. These samples appear to be associated with high soluble fractions. A separate analysis of these cases appears later. The lines in each case were forced through the origin, thus the slopes represent the average fraction for the period of study. The fitted values are summarized in Table III-2.

Table III-2: BOD fractions in the DSWC and San Joaquin River at the USGS UVM Station.

Location	CBOD/BOD	sBOD/BOD	sCBOD/BOD
San Joaquin River	0.63	0.47	0.26
DWSC (Lt. 43)	0.58	0.45	0.28

Using these ratios, the concentrations of nitrogenous BOD, soluble NBOD, particulate BOD, particulate CBOD, and particulate NBOD can be estimated by:

NBOD = BOD - CBOD,
sNBOD = sBOD - sCBOD,
Particulate BOD = BOD - sBOD,
Particulate CBOD = CBOD - sCBOD,
Particulate NBOD = NBOD – sNBOD = BOD – CBOD – sBOD + sCBOD.

Dividing by BOD yields:

NBOD / BOD = 1 - CBOD/BOD,
sNBOD / BOD = sBOD/BOD - sCBOD/BOD,
Particulate BOD / BOD = 1 - sBOD/BOD,
Particulate CBOD / BOD = CBOD/BOD - sCBOD/BOD,
Particulate NBOD /BOD = 1 – CBOD/BOD – sBOD/BOD + sCBOD/BOD.

Table III-3 presents fractions of these constituents relative to total BOD are calculated from ratios estimated above.

Table III-3: BOD fractions in the DSWC and San Joaquin River at the USGS UVM Station.

Location	NBOD / BOD	sNBOD / BOD	pBOD / BOD	pCBOD / BOD	pNBOD / BOD
San Joaquin River	0.37	.21	.53	0.37	0.16
DWSC	0.42	.17	.55	0.30	0.25

These estimates suggest that slightly more than 50 percent of the BOD entering or in the DWSC is associated with particulate matter. These estimates also indicate that approximately 40 percent of the BOD, entering or in the DWSC, consists of NBOD. Of this soluble fraction, approximately 50 percent is nitrogenous.

A common chemical expression of algae decomposition provides estimates of its associated CBOD and NBOD:

$$\underset{\text{(algae)}}{C_{106}H_{263}O_{110}N_{16}P} + 138\ O_2 \rightarrow 106\ CO_2 + 16\ NO_3^- + HPO_4^{2-} + 122\ H_2O + 18\ H^+.$$

Each mg/L of algae will yield a theoretical oxygen demand of 1.2 mg/L. Of this 1.2 mg/L, approximately 25 percent is nitrogenous.

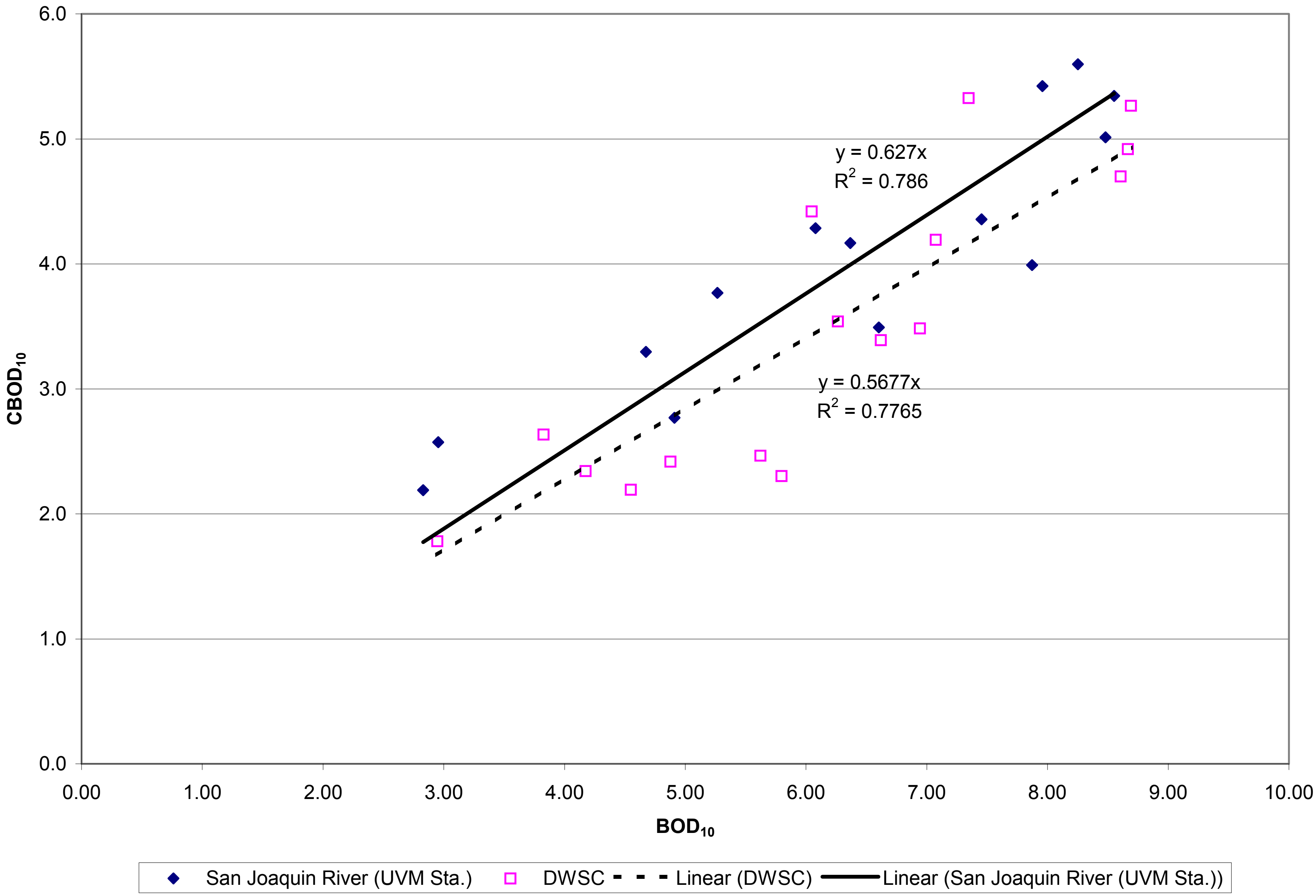

Figure III-7: Carbonaceous BOD_{10} vs. BOD_{10} for samples collected in the DWSC and San Joaquin River at the USGS UVM station.

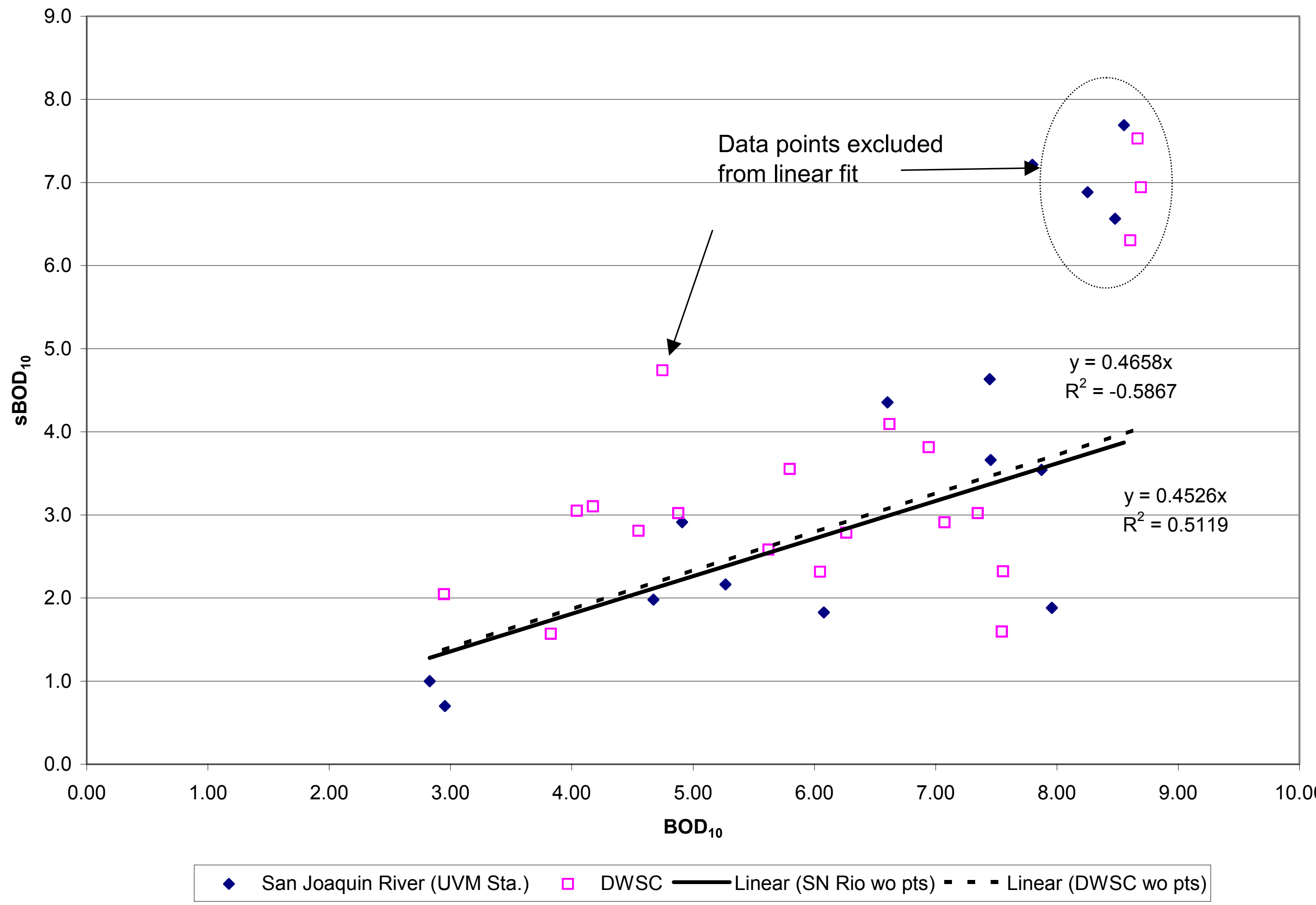

Figure III-8: Soluble BOD_{10} vs. BOD_{10} for samples collected in the DWSC and San Joaquin River at the USGS UVM station.

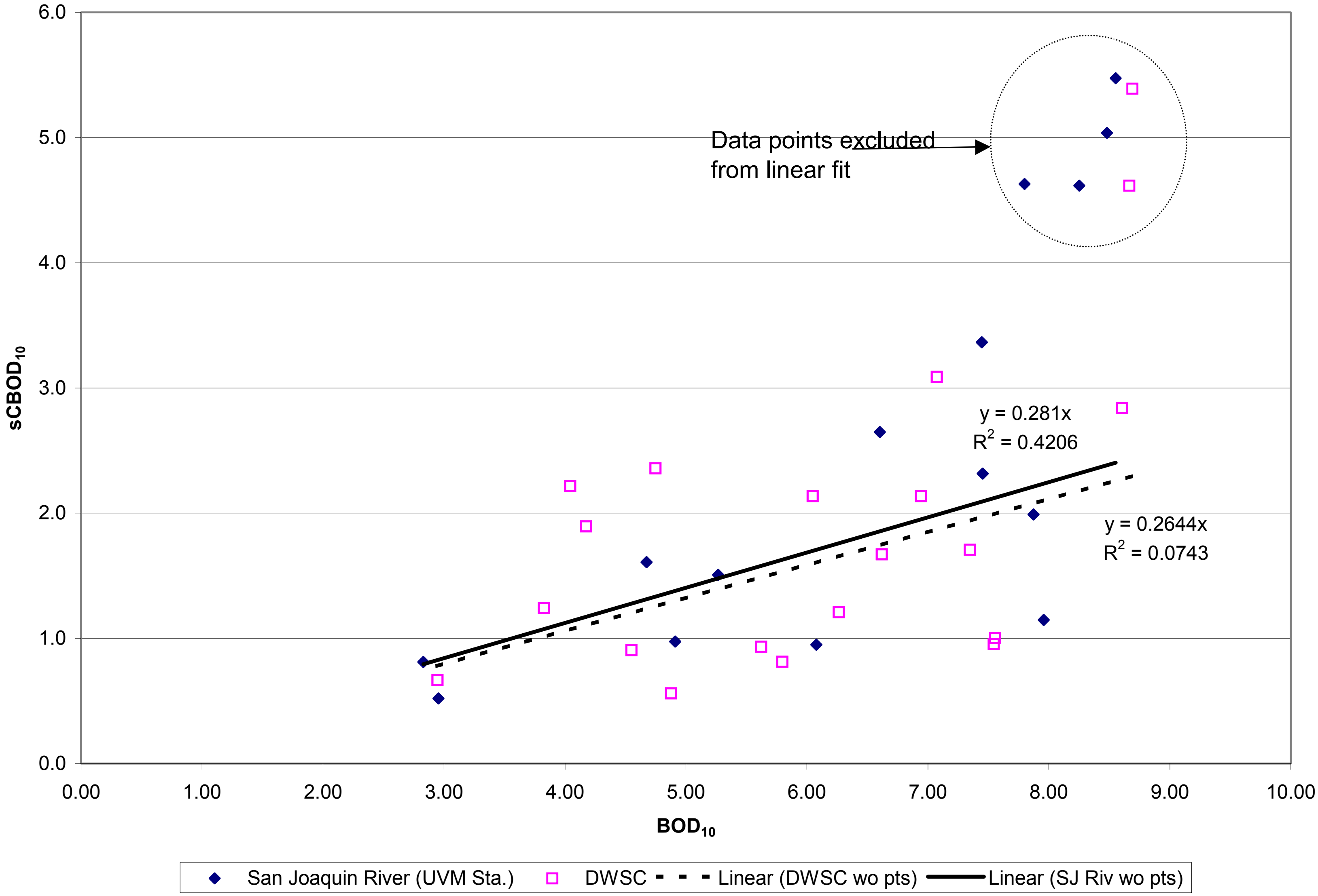

Figure III-9: Soluble carbonaceous BOD_{10} vs. BOD_{10} for samples collected in the DWSC and San Joaquin River at the USGS UVM station.

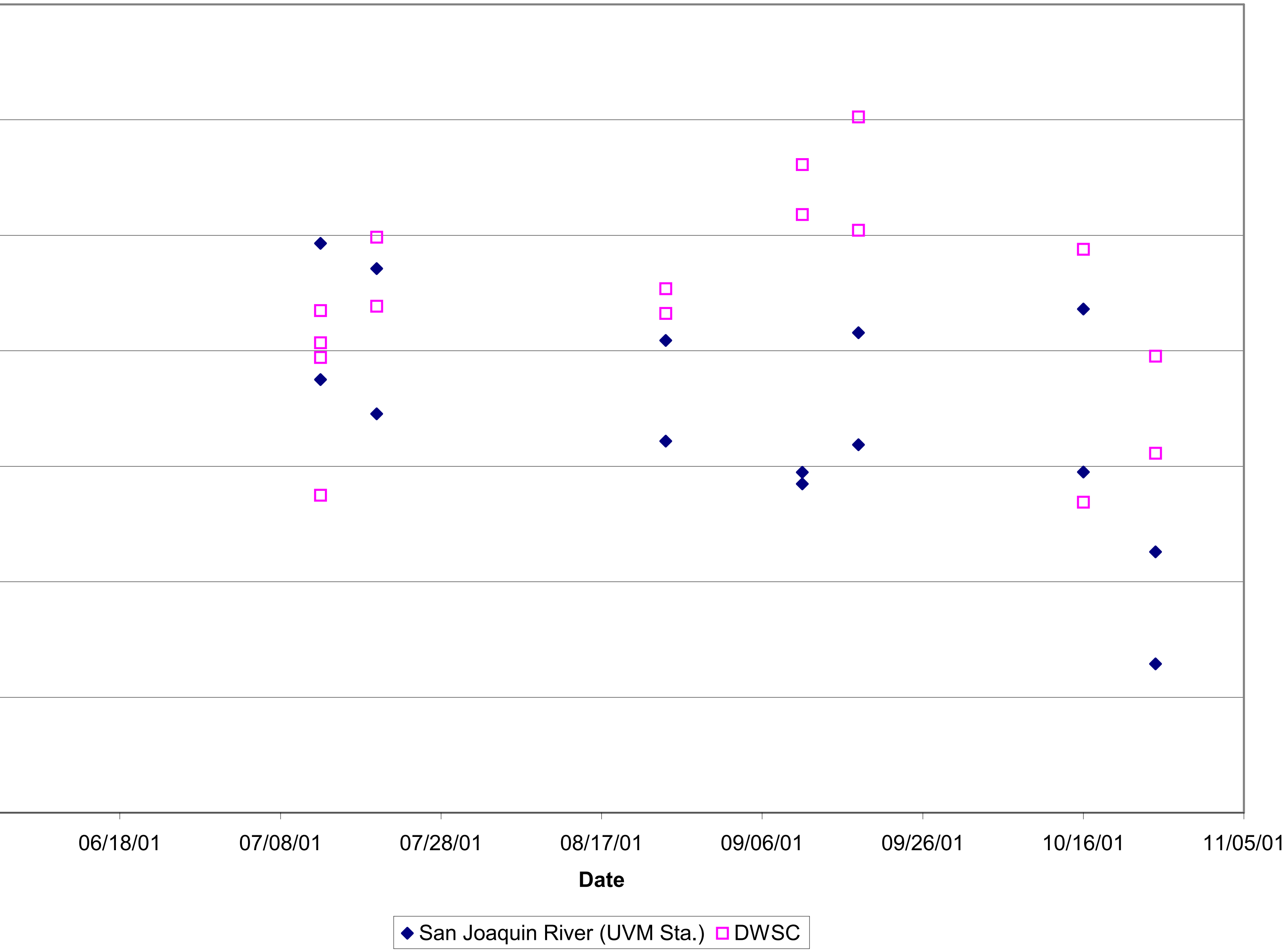

Figure III-10: Comparison of fraction of $NBOD_{10}/BOD_{10}$ in the DWSC and entering the DWSC as measured at the USGS UVM Station on the San Joaquin River.

Oxygen Demands Correlations with Water Quality Data

The TSS, VSS, and phytoplankton pigment concentrations were shown earlier to decrease with downstream distance in the DWSC. Approximately 90 percent of the decline of TSS is associated with the burial of its inorganic fraction. The remaining 10 percent is organic matter that may be lost with decay in the water column or upon settling with subsequent decay. To estimate the potential sediment oxygen demand (SOD) associated with settling matter, correlations of BOD and the constituents measured here to characterize the suspended matter concentrations were investigated.

Figures III-10 through III-13 show the BOD_{10} data was plotted against TSS, VSS, chlorophyll *a*, and chlorophyll *a* plus pheophytin *a* concentrations. As shown in Figure III-11, the BOD_{10} appears to be best correlated to VSS, especially for the San Joaquin River. The y-axis intercept of these lines represents the BOD_{10} when the VSS is zero, or in other words, the average soluble concentration of the BOD_{10}.

To assess the ratio of particulate BOD_{ult} to VSS, the y-axis intercept of the fitted line to the BOD_{ult} data was subtracted from the BOD_{ult} values. The y-axis intercepts of 5.70 and 6.44 mg/L were obtained to adjust the particulate BOD_{ult} values for the San Joaquin River and the DWSC, respectively. The intercept-adjusted particulate BOD_{ult} are plotted against VSS in Figure III-14. The slope of the fitted curves are virtually the same at 1.1 mg BOD_{ult} per 1mg of VSS. This ratio is consistent with the theoretical oxygen demand of 1.07 mg BOD_{ult} per mg of VSS if 40 percent of the VSS mass is carbon molecules.

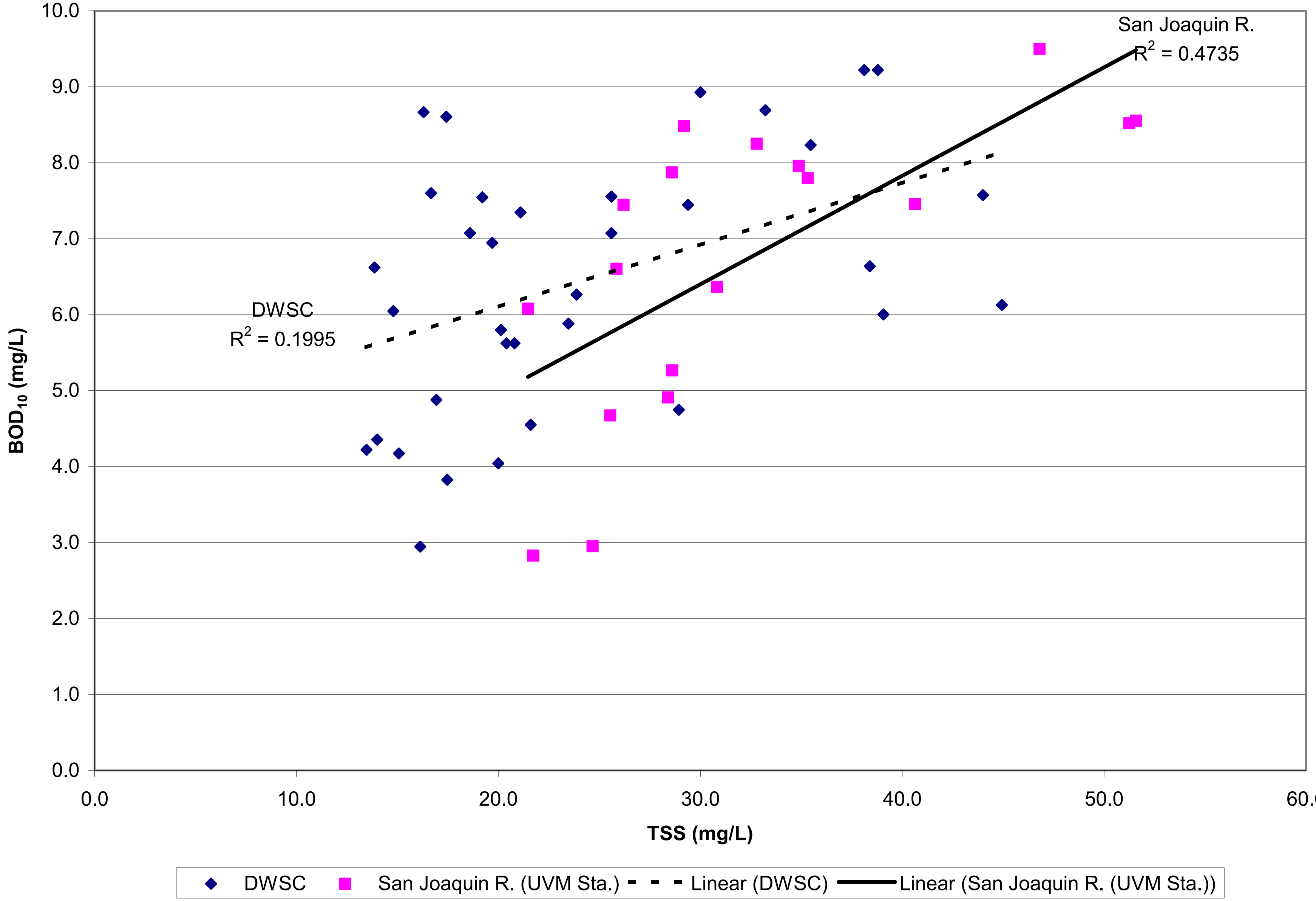

Figure III-10 : Water BOD_{10} vs. TSS concentration

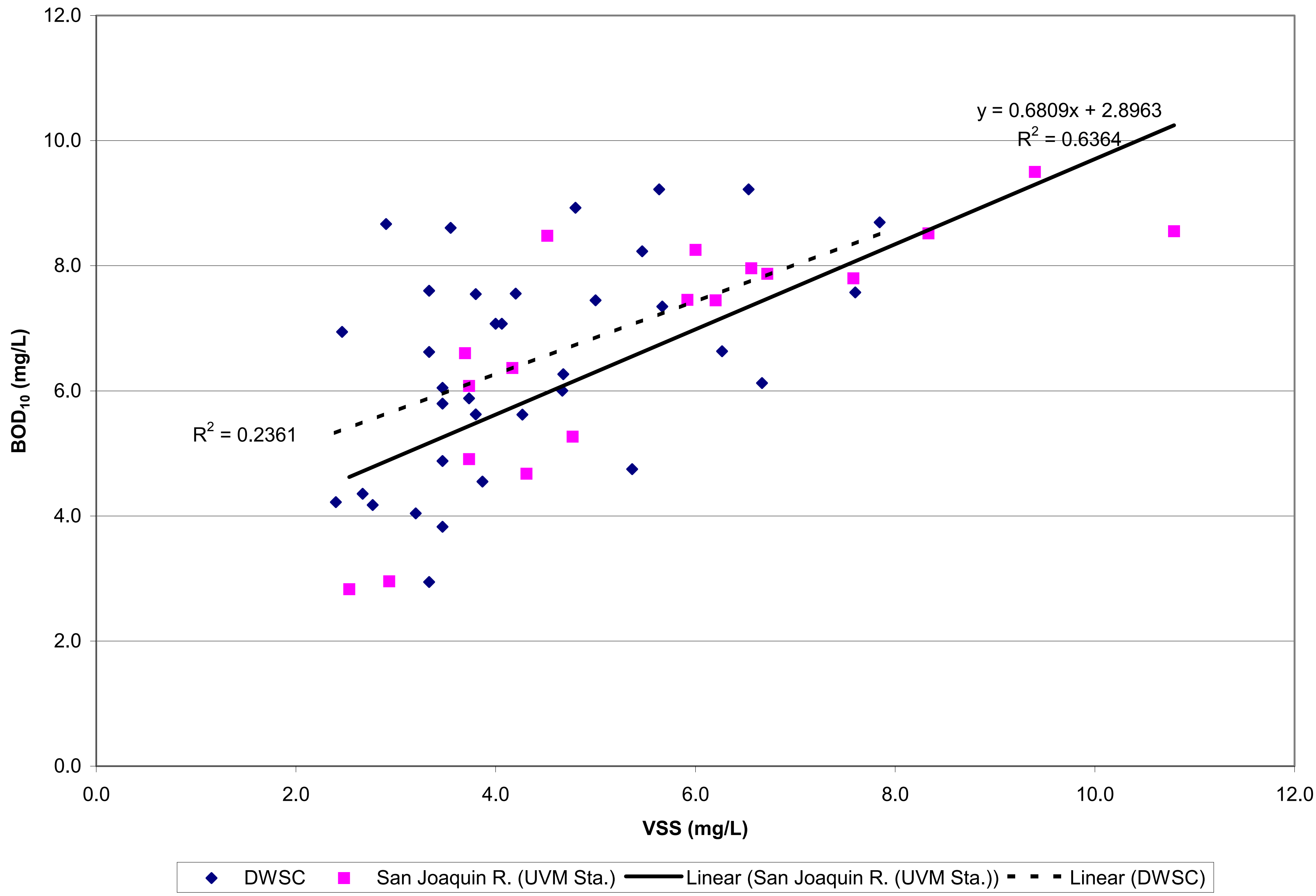

Figure III-11 : Water BOD_{10} vs. VSS concentration.

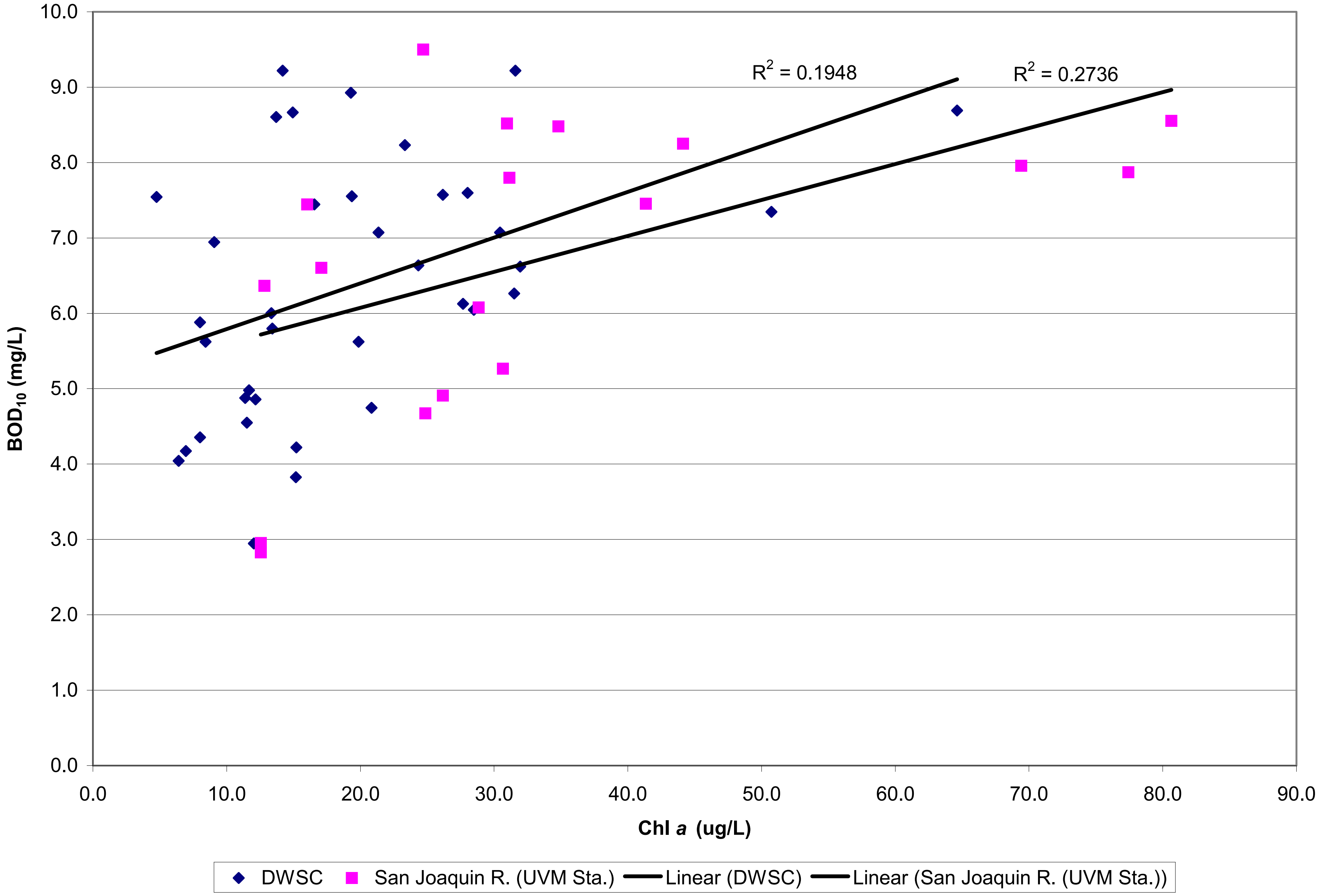

Figure III-12 : Water BOD_{10} vs. Chlorophyll *a* concentration.

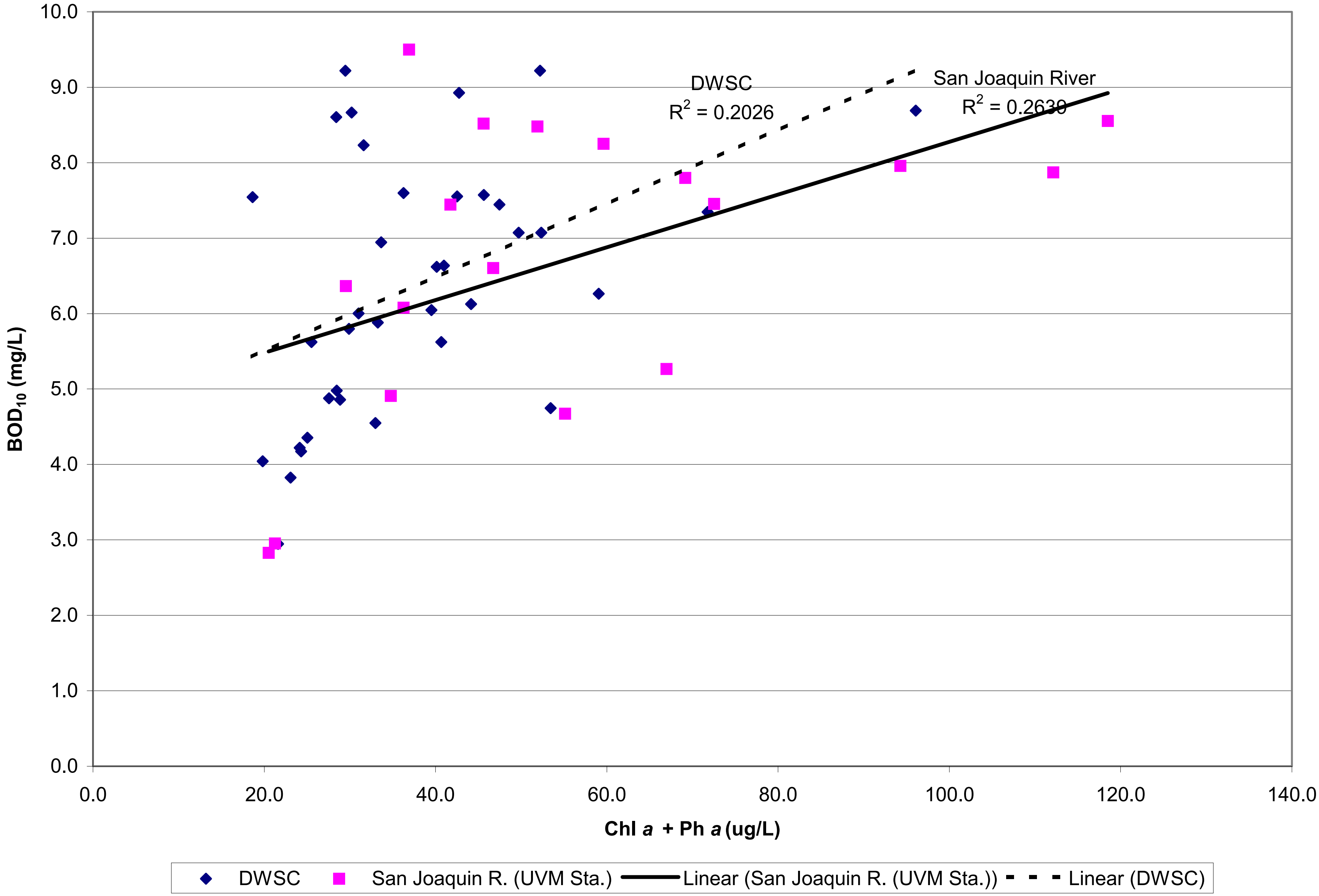

Figure III-13 : Water BOD_{10} vs. chlorophyll *a* plus pheophytin *a* concentration

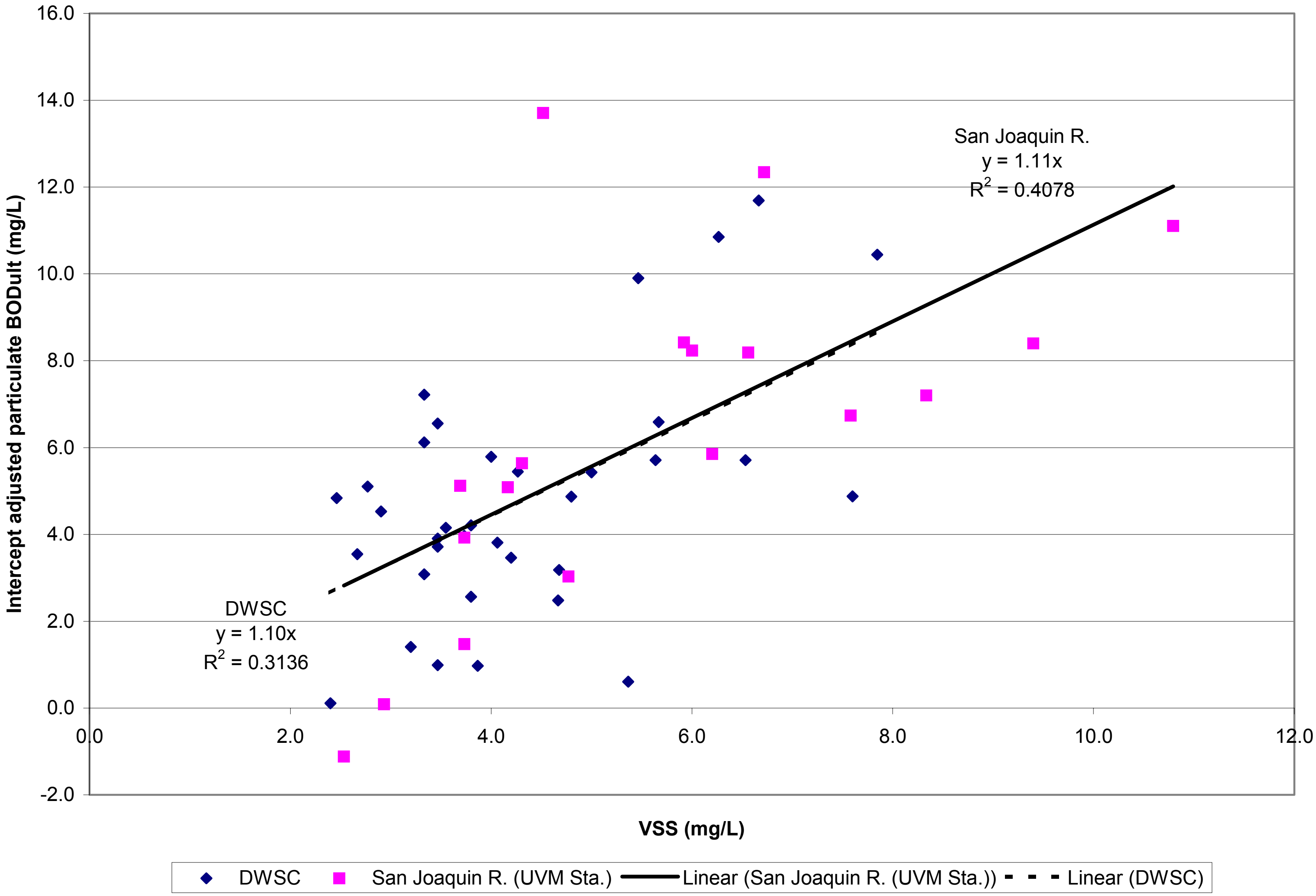

Figure III-14: Particulate BOD_{ult} vs. VSS concentrations for the San Joaquin River and the DWSC.

Trapped Sediment BOD results

The BOD of trapped sediments was estimated with bottle experiments at 20°C. As described earlier, first-order decay curves were fit to the oxygen demand of trapped sediments. All sediment BOD data were adjusted by subtracting the water contribution. The oxygen demand of the sediments were then divided by the mass of TSS, VSS, or chlorophyll *a* plus pheophytin *a* of the sediments used in the bottle experiments. These data are presented in Table D-II of Appendix D. The data are also plotted in Figures III-15 through III-17.

Similar to the water BOD results, the trapped sediments were again well correlated to their VSS mass. The data shown in Figure III-16 shows the BOD_{ult} to range from 0.1 to 0.4 mg BOD_{ult} for each mg of VSS in the trapped sediments. The average is approximately 0.25 mg BOD_{ult} per mg VSS. This is considerably less than the water ratio of particulate BOD_{ult} to VSS estimated previously to be 1.1 mg/mg. Thus, sediments that are trapped possess an oxygen demand that is approximately 3 to 4 times less than that of the particulate matter entering the San Joaquin River or collected in a water sample from the DWSC. Settling studies presented earlier indicate that the trapped sediments are comprised of fast settling aggregates. The age of the phytoplankton pigments associated with the trapped sediments also indicated that the transport of trapped sediments may be retarded approximately two times due to settling and resuspension processes. Thus, these observations for settling and resuspension rates support the low oxygen demands measured for the trapped sediments. It appears that the predominance of the matter captured in the sediment traps is relatively old and much of its oxygen has been exerted.

The first-order decay rates, k, of the trapped sediment are presented in Figure III-18. The sediment rates are more variable than the water decay rates, ranging from approximately 0.05 to 0.24 d^{-1}. The average k is approximately 0.12 d^{-1}. For many, but not all of the data sets, the highest decay rates were associated with sediments collected from the upper traps and decreased with trap depth. This may be caused by higher fractions of refractory organic matter captured in the traps near the channel bottom.

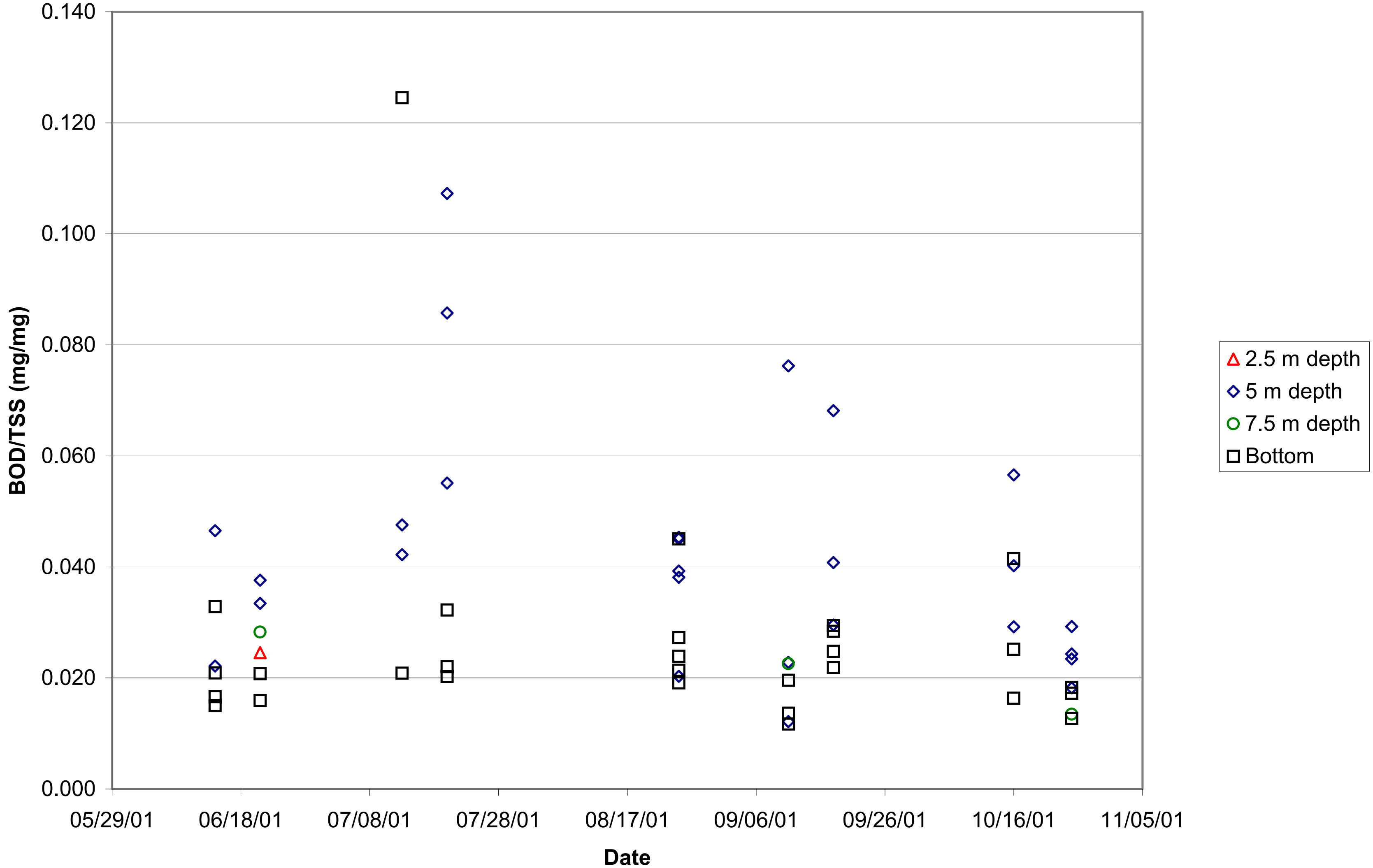

Figure III-15: Sediment mg BOD_{ult} / mg TSS in the DWSC.

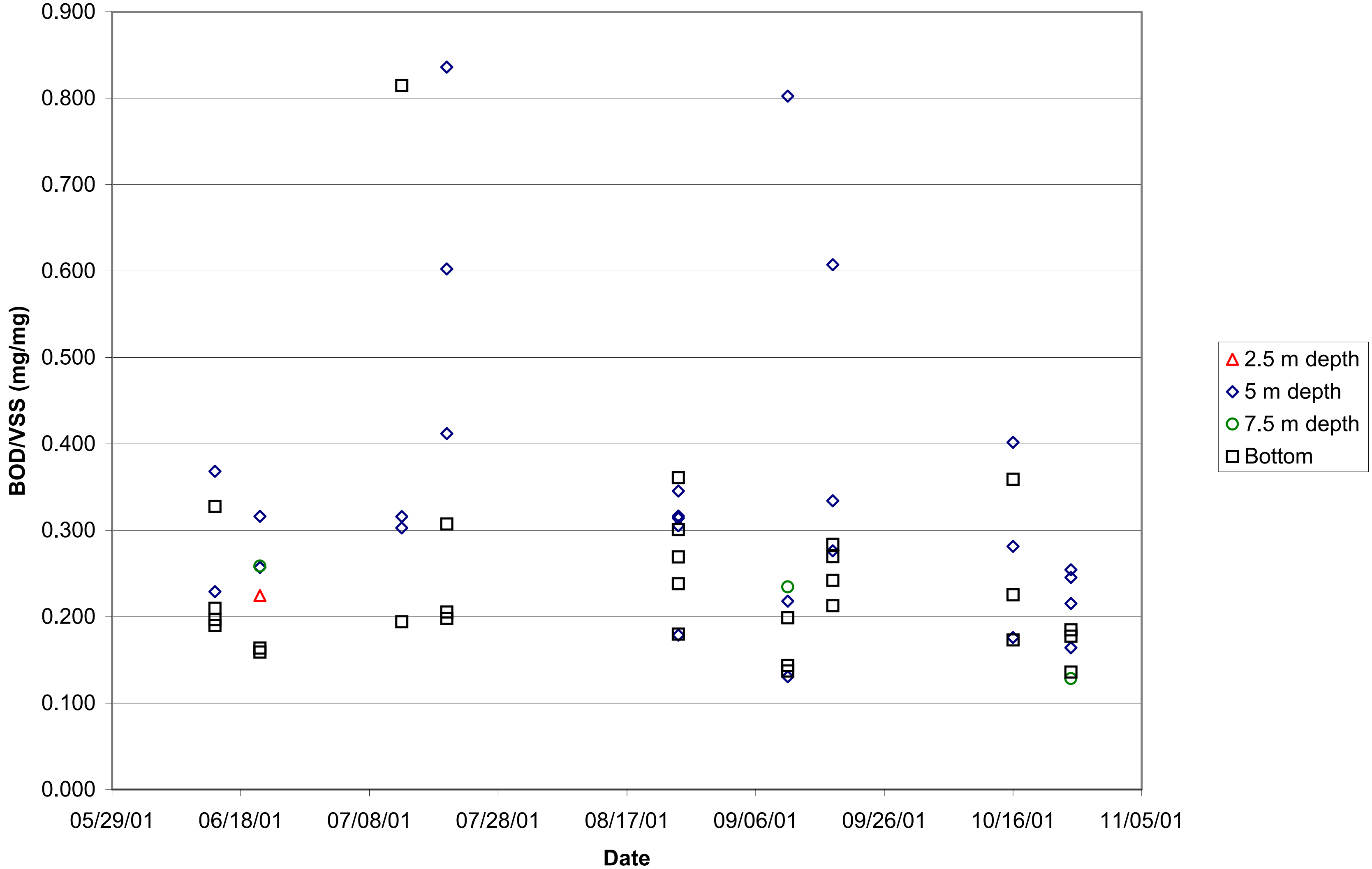

Figure III-16: Sediment mg BOD_{ult} / mg VSS in the DWSC.

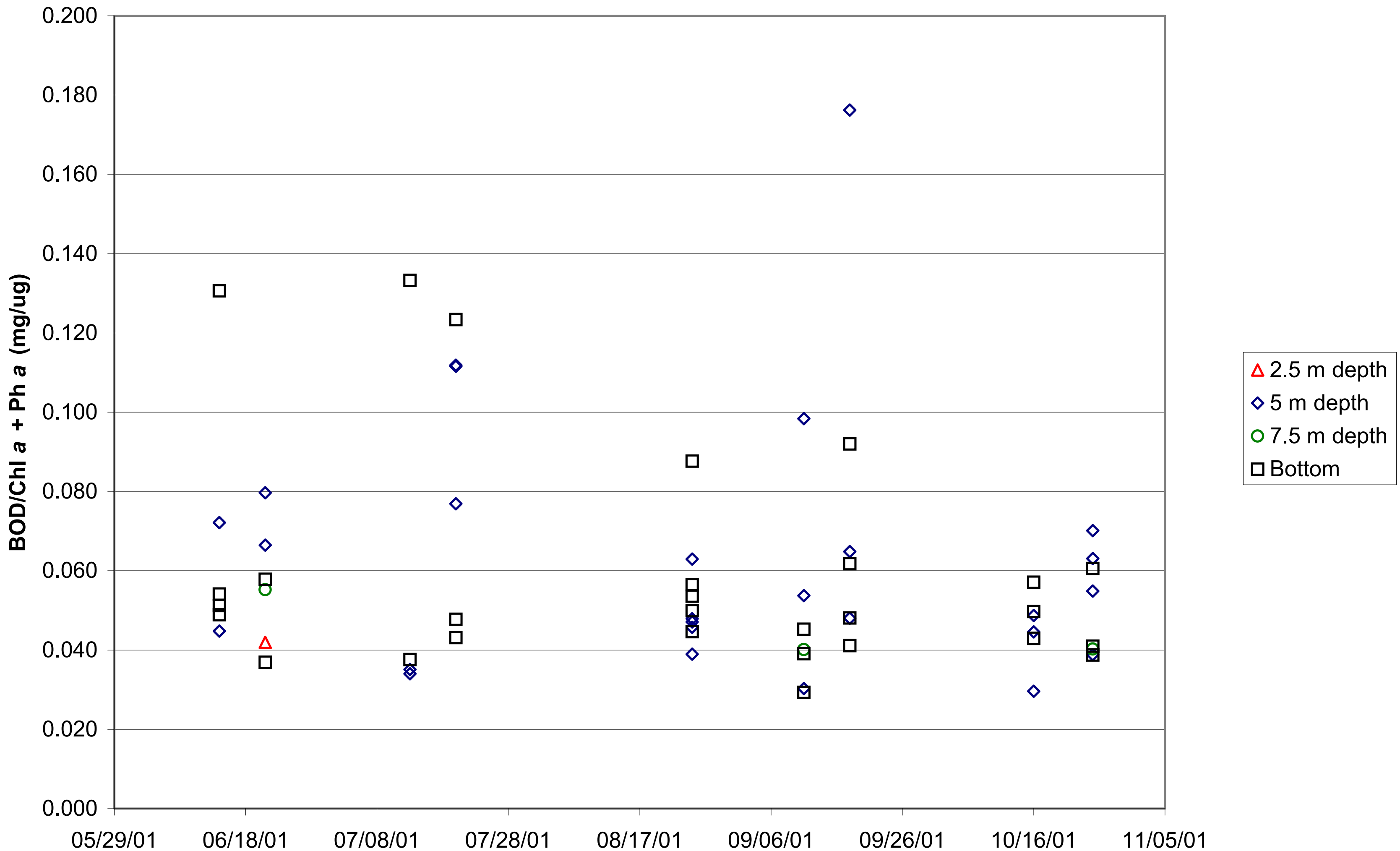

Figure III-17: Sediment mg BOD_{ult} / µg chlorophyll *a* plus pheophytin *a* in the DWSC.

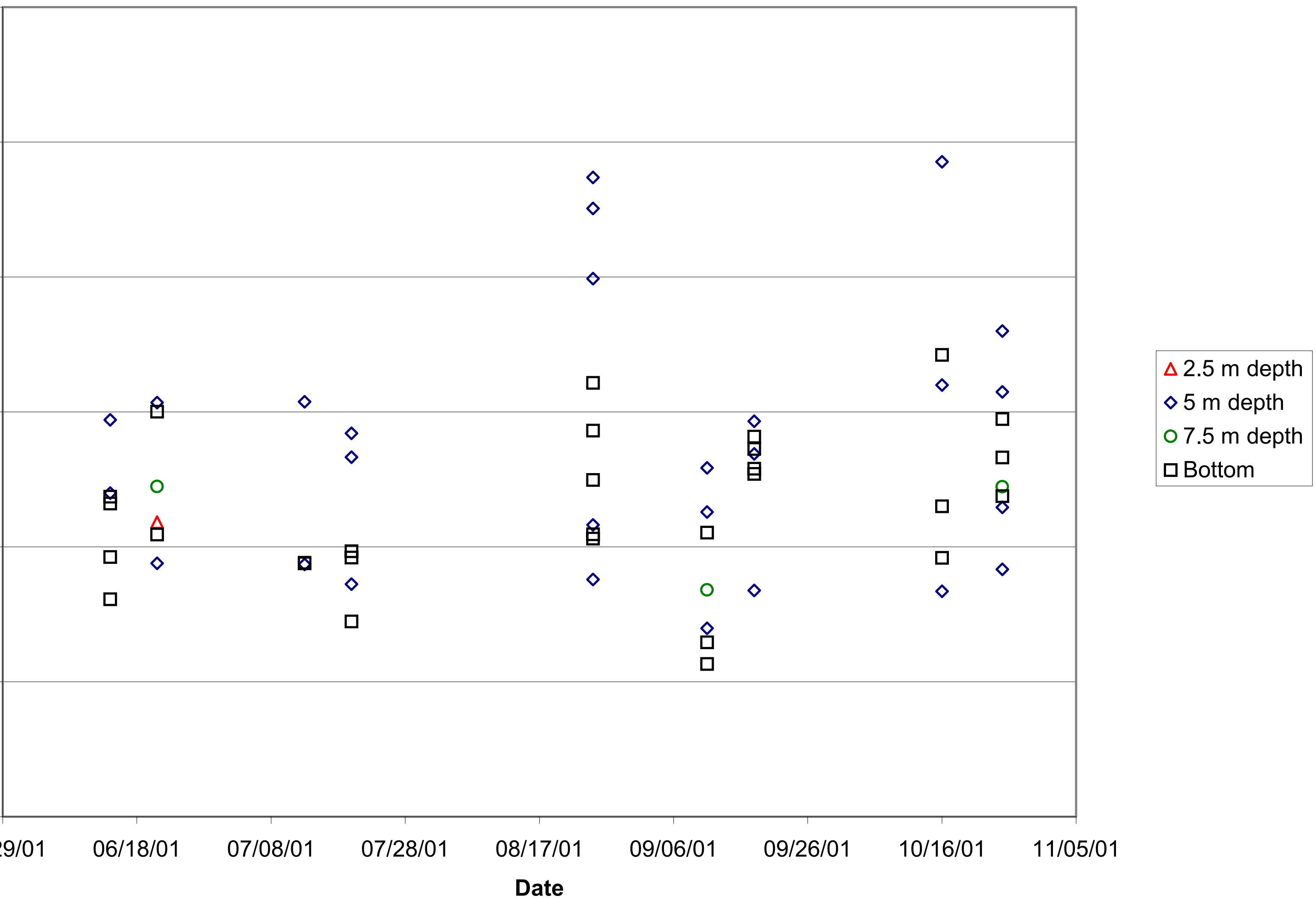

Figure III-18: First-order BOD decay constant, k, at 20°C for trapped sediments collected in the DWSC.

IV. Comparisons of Data Collected in 2000 and 2001

Depth averaged TSS water concentrations and deposition fluxes, are plotted for 2000 and 2001 in Figures IV-1 and IV-2. Depth average TSS water concentrations in the San Joaquin River above the DWSC ranged from approximately 23 to 48 mg/L in both 2000 and 2001. However, average San Joaquin River TSS concentrations were measured at levels greater than 35 mg/L on three days in 2001, but on only 1 day during 2000. Within the DWSC, TSS concentrations were fairly similar with values ranging from 20 to 35 mg/L. More variability was observed in the 2001 DWSC TSS concentrations. Depth-averaged TSS deposition fluxes in the DWSC were also similar at Lt. 38 and Lt. 43. At Lt. 48 deposition fluxes increased during 2001 while San Joaquin River concentration above the DWSC decreased, evidence that much of the turbidity in the DWSC is associated with sediment resuspension rather than the incoming sediment concentration. For 2001, the San Joaquin River concentration also exhibited a decreasing trend from June to November. However, deposition fluxes at Lt. 48 were quite variable but generally remained in the same range observed during 2000.

As shown in Figure IV-3, the depth-averaged VSS concentrations in the San Joaquin River and DWSC exhibited a declining trend during 2000. The decline appears to be correlated to the rise in the dissolved oxygen concentration in the DWSC also plotted in Figure IV-3. During 2001, the San Joaquin River VSS concentrations above the DWSC were initially high (approximately 7 to 9 mg/L) in June and early July, and then decreased to less than 3 mg/L by late October. In the DWSC, VSS concentrations did not exhibit the same decline observed in the San Joaquin River above the DWSC for 2001 and did not exhibit the same decrease observed in the DWSC during 2000.

As shown in Figure IV-3, the recovery of dissolved oxygen in the DWSC was delayed until mid September in 2001. During 2000, dissolved oxygen concentrations were initially at 5.5 mg/L and increased above 6 mg/L by late August. The late recovery of dissolved oxygen in 2001 appears to be associated with lower initial levels (approximately 4-5 mg/L) measured in June. Loads of oxygen depleting substances entering the DWSC in 2001 may have been greater than 2000. However, monitoring was not performed prior to June so the data characterizing the conditions leading to the lower dissolved oxygen levels in 2001 are not available with this work.

Depth-averaged deposition fluxes shown in Figure IV-4 indicate that the VSS flux rates were quite similar for both 2000 and 2001. Deposition rates offer little explanation for the low dissolved oxygen concentration measured in 2001 and the relatively high concentrations of 2000.

Chlorophyll *a* concentrations are plotted for 2000 and 2001 in Figure IV-5. The chlorophyll *a* concentrations in the San Joaquin River and DWSC are markedly different for the two years. The general decrease in chlorophyll *a* observed at all stations in 2000 is quite different from the highly variable concentrations measured in 2001. However the chlorophyll *a* concentrations measured at Lt. 43 and Lt. 38 are relative similar for both years. Concentrations at Lt. 48 are much more variable. Fluctuations at Lt. 48 appear to be associated with the chlorophyll *a* concentrations entering the DWSC. In Figure IV-6, deposition fluxes averaged over the water column for chlorophyll *a* also show similarity at Lt. 43 and Lt. 38, but at Lt. 48 the deposition fluxes of 2001greatly exceed 2000 measurements. While not quantified here, greater algae concentrations and associated loads seem to have arrived in 2001 compared with 2000. This is also seen in the water concentration and deposition flux plots of chlorophyll *a* plus pheophytin *a* presented in Figures IV-7 and IV-8. The water concentrations of chlorophyll *a* plus pheophytin *a* entering the DWSC from the San Joaquin River and at Lt. 48 in the DWSC are on some days much higher than measurement of 2000 as shown in Figure IV-7. Deposition fluxes of chlorophyll *a* plus pheophytin *a* at Lt. 48 were often much higher in 2001 as presented in Figure IV-8. However, the deposition fluxes at Lt. 43 are relatively similar. These comparisons suggest that higher algae loads in 2001 contributed to greater dissolved oxygen deficit, however, the lack of measurements performed prior to the onset of the DO deficit in the DWSC prevents a more quantitative analysis.

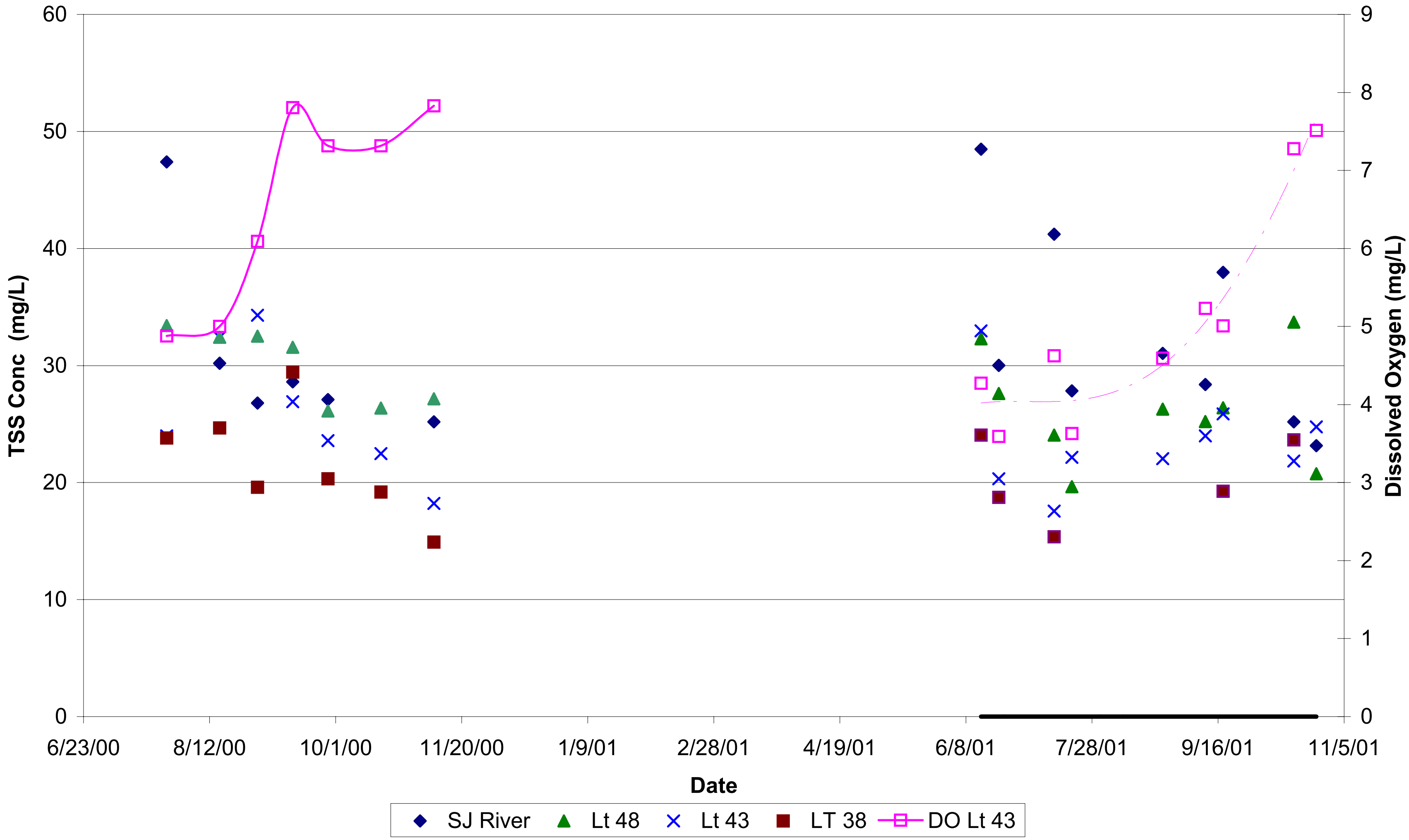

Figure IV-1: Averages TSS water concentrations in the DWSC during periods of trap deployment for 2000 and 2001.

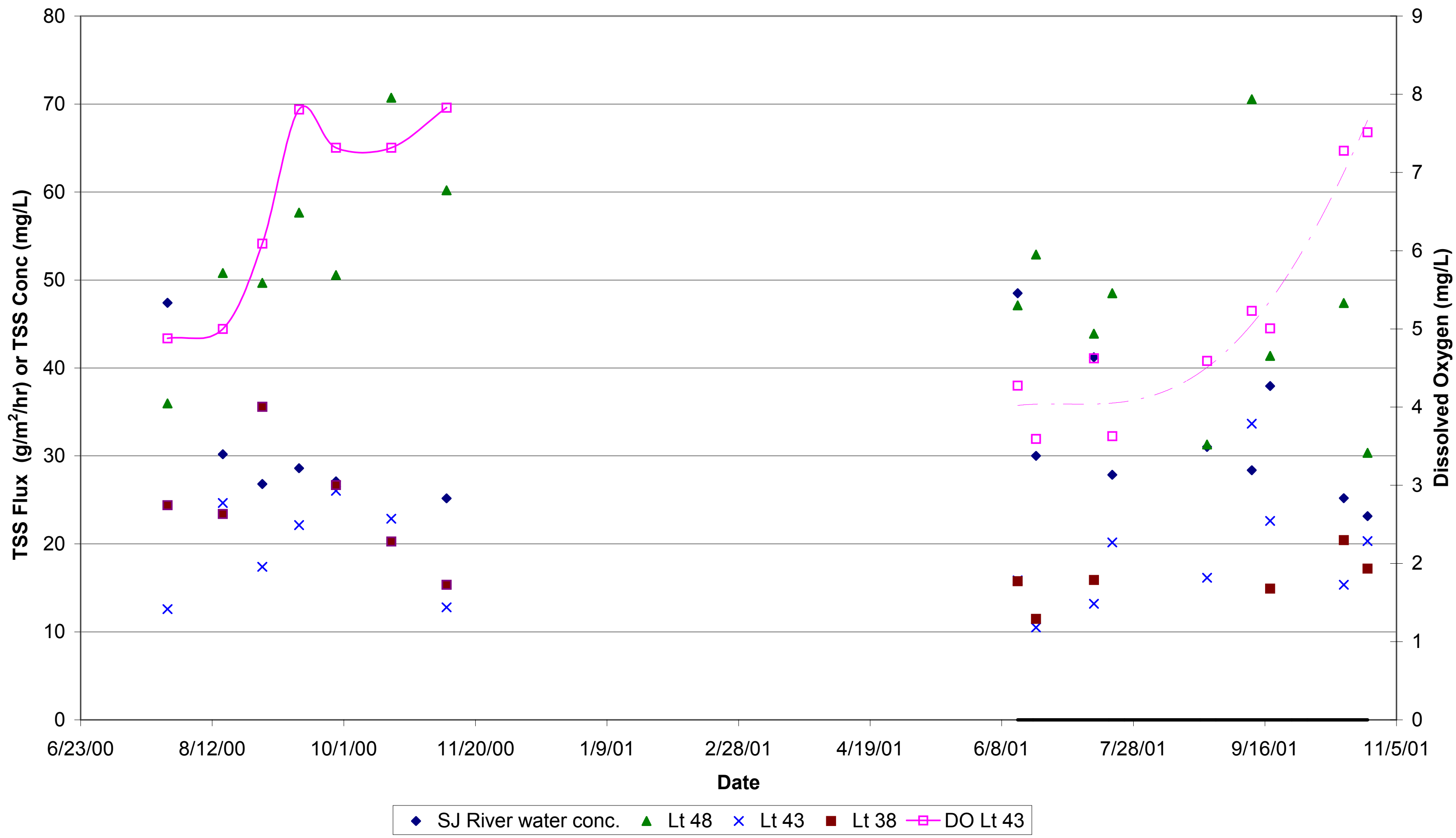

Figure IV-2: Averages TSS deposition fluxes in the DWSC during periods of trap deployment for 2000 and 2001.

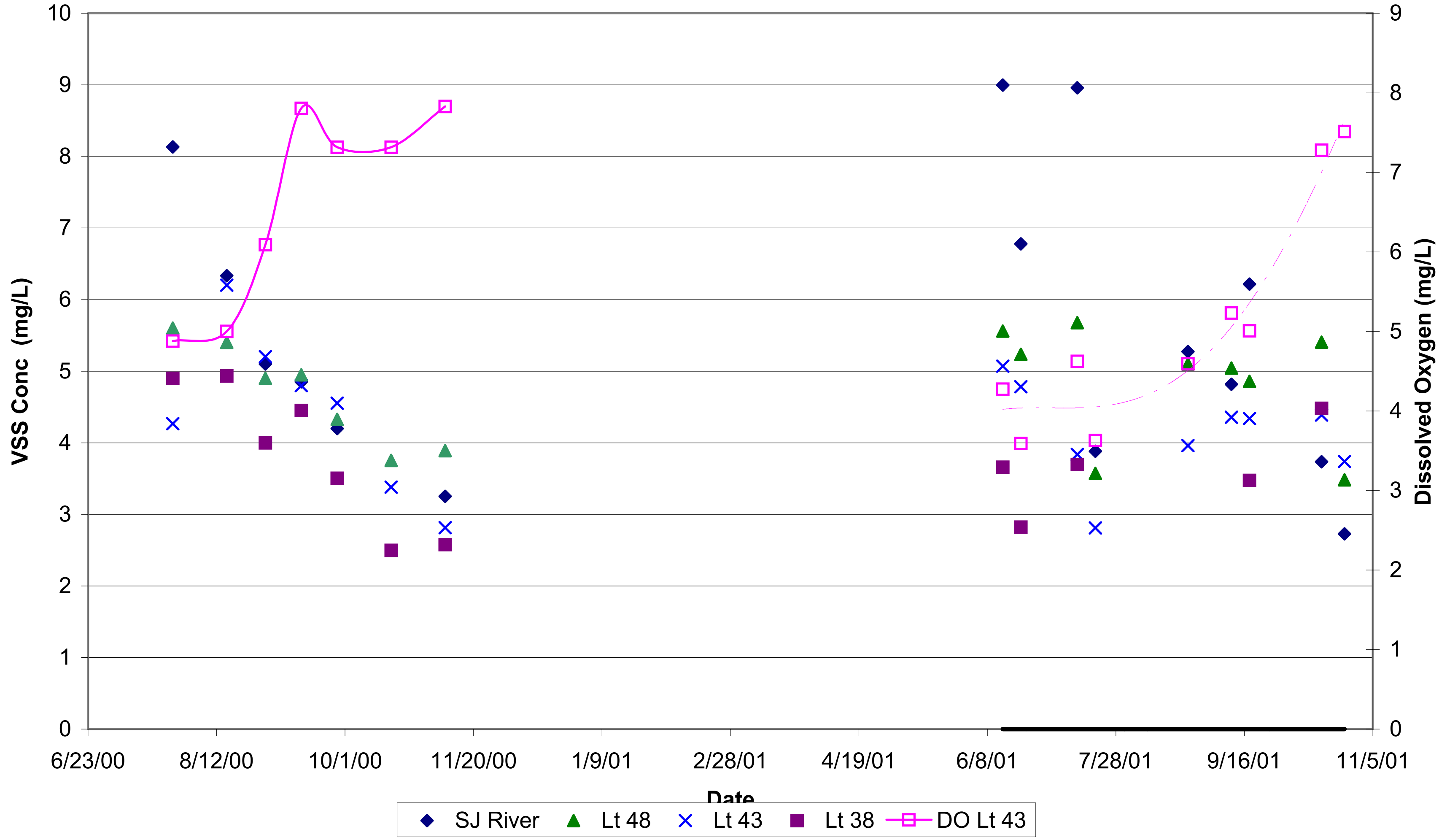

Figure IV-3: Depth-averaged VSS water concentrations in the DWSC during periods of trap deployment for 2000 and 2001.

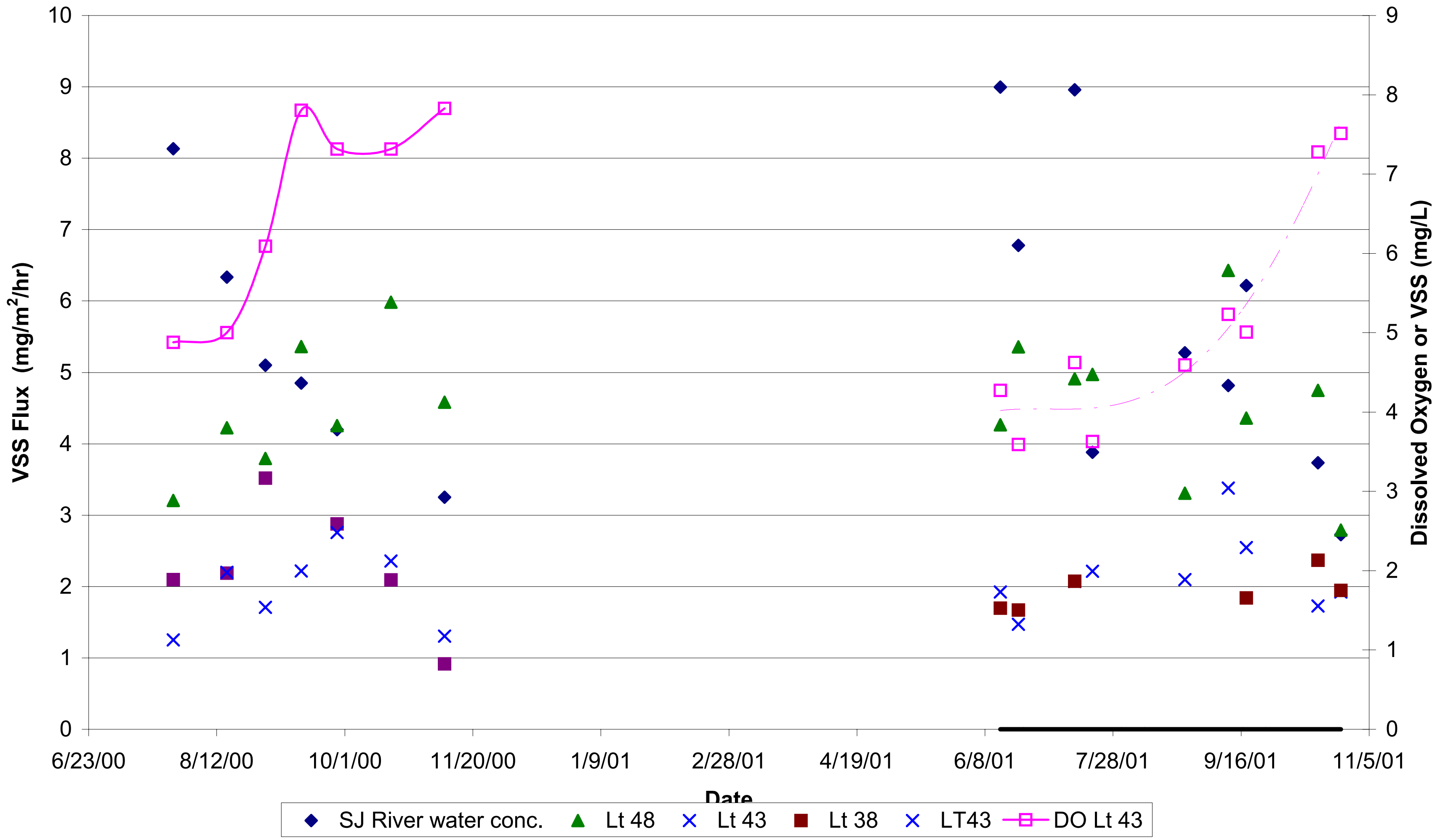

Figure IV-4: Depth-averaged VSS deposition fluxes in the DWSC during periods of trap deployment for 2000 and 2001

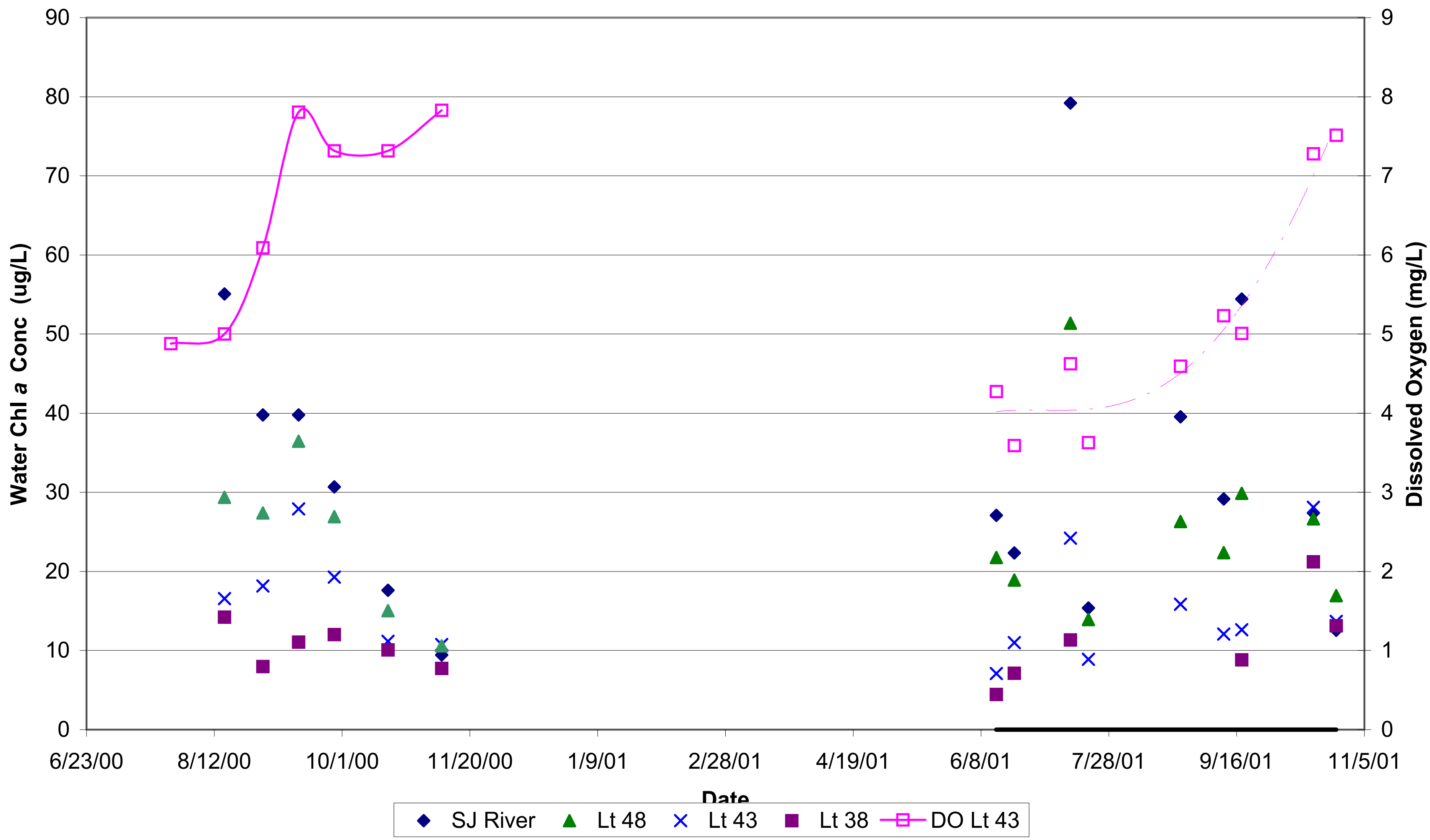

Figure IV-5: Depth-averaged chlorophyll *a* water concentrations in the DWSC during periods of trap deployment for 2000 and 2001

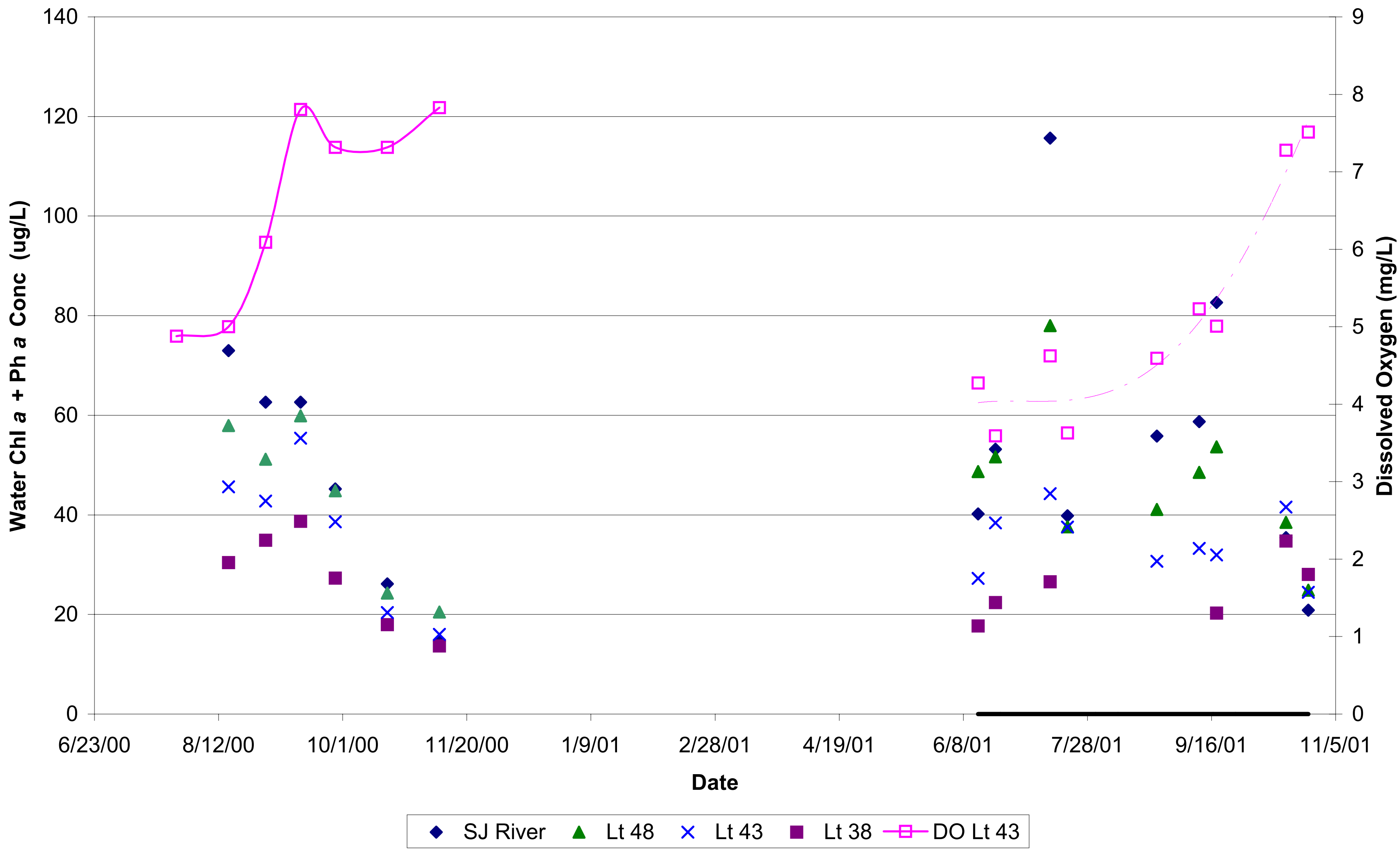

Figure IV-6: Depth-averaged chlorophyll *a* deposition fluxes in the DWSC during periods of trap deployment for 2000 and 2001.

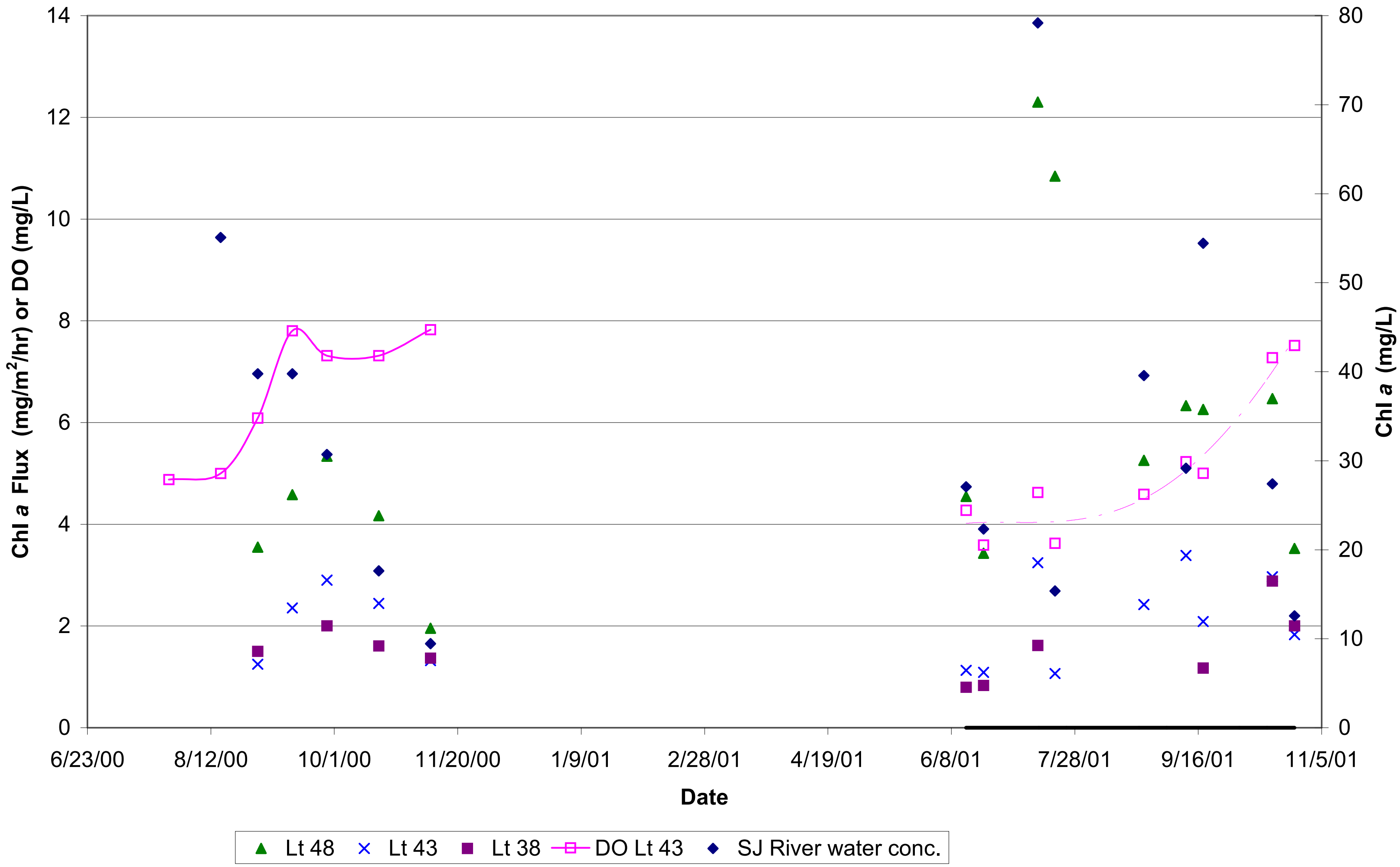

Figure IV-7: Depth averaged chlorophyll *a* + pheophytin *a* water concentrations in the DWSC during periods of trap deployment for 2000 and 2001

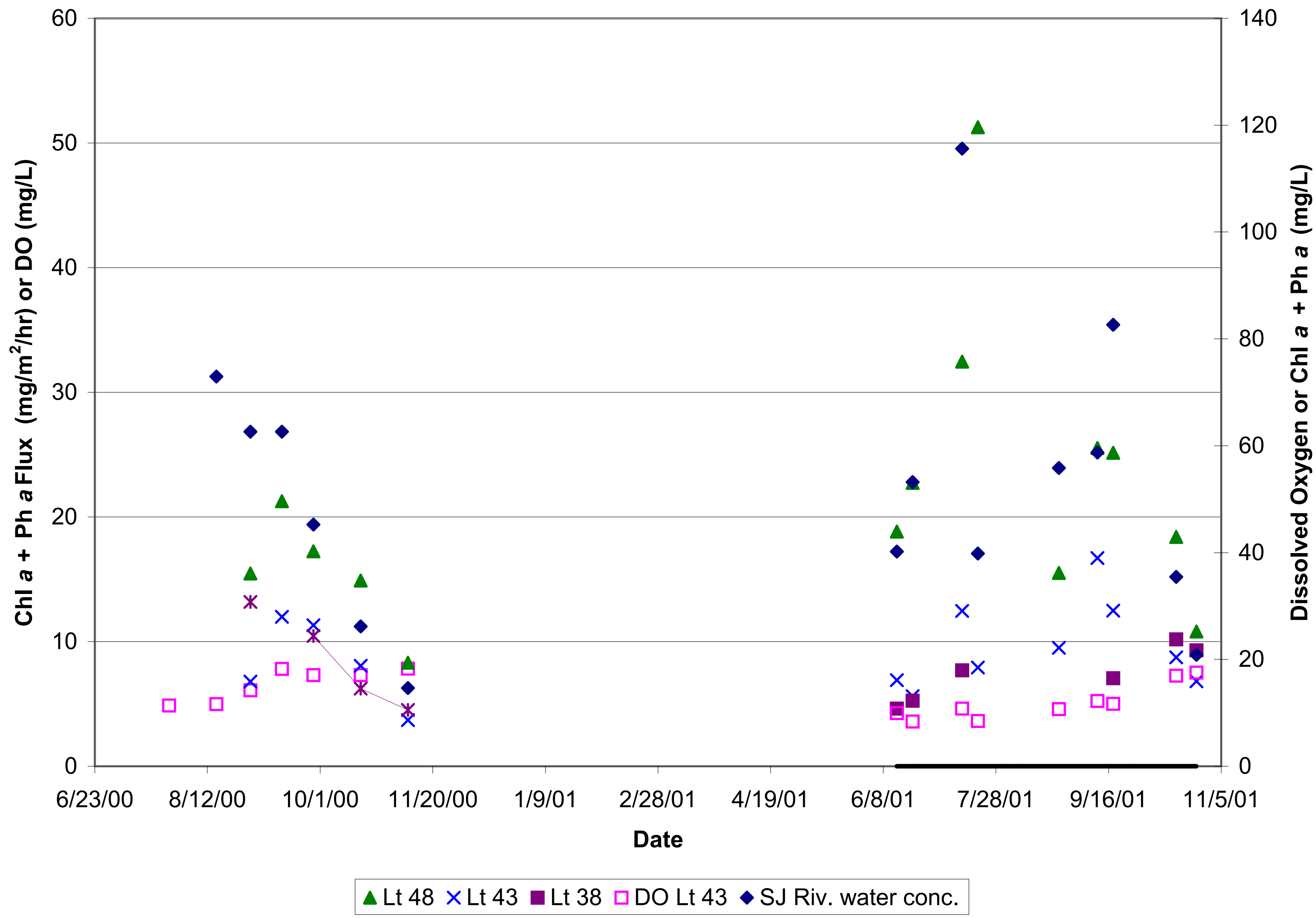

Figure IV-8: Depth averaged chlorophyll *a* + pheophytin *a* deposition fluxes in the DWSC during periods of trap deployment for 2000 and 2001.

V. Sediment Oxygen Demand Measurements

The sediment oxygen demand was measured directed with sediment cores collected at the bottom of the DWSC at Navigation Lights 38, 43, 48, and in the Turning Basin. The cores were collected in an acrylic tube from the center of the channel on the following dates during 2001:

- August 2,
- August 30,
- September 16,
- October 4,
- November 1.

<u>Materials and Methods</u>

The 8.9-cm diameter, 31-cm long sampling tube was attached to a weighted aluminum frame and lowered to the sediment water interface. The frame limited the penetration of the tube in the sediment to approximately 15 cm. Actual core depths varied from 10 to 16 cm. Once embedded in the sediments, a spring-loaded plate was released to close the top of the sampling tube. The tube was raised to the surface where another plate was fastened at the bottom prior to lifting the sediment sample from the water. The sample was then transferred to shore where a top with DO probe and water circulation fittings was attached. A schematic diagram of the sediment chamber is shown in Figure V-1 (as will be discussed later the apparatus for August 2 was slightly different). Circulation was started and the initial DO concentration was measured with a YSI 55 dissolved oxygen meter. Circulation was accomplished with a 4-channel peristaltic pump. The flow rate of 150 mL min^{-1} recirculated the water above the sediment every 6 to 9 minutes, depending on the actual volume of water overlying the sediment core. This flow rate also provided water turbidities similar to levels measured above the sediment water interface in the DWSC at the time the sediment samples were collected.

Immediately before collecting the sediment sample, the water temperature, turbidity, and DO were measured within 2 feet of the sediment-water interface. A sample of water was also collected and placed in a BOD bottle to monitor the DO depletion of the water in the absence of the sediment interface. The sediment oxygen demand (SOD) was determined by subtracting the water DO depletion rate from the chamber depletion rate and multiplying by the depth of water overlying the sediment surface in each chamber.

The chambers were tested for water and air leaks prior to conducting the field measurements. Figure V-2 presents the results of the tests conducted over a three-hour time period. These results indicate that the chamber apparatus was effectively closed from the atmosphere.

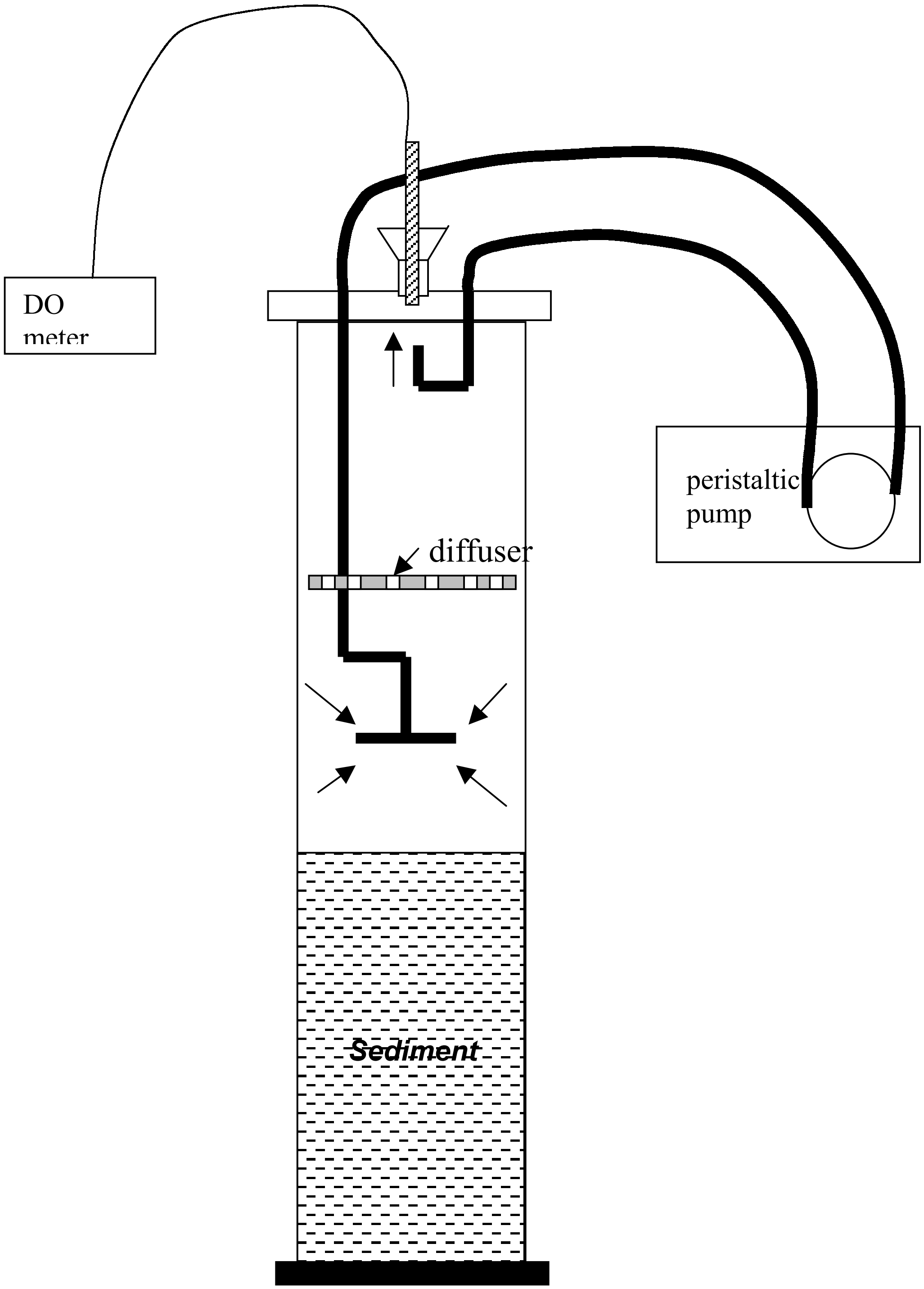

Figure V-I: Sediment Oxygen Demand Apparatus

Results and Discussion

An example of the SOD chamber results are shown for September 16 in Figure V-3. Oxygen depletion was determined by a least-squares line fit through DO concentrations measured for at least 8 hours. The slope of the lines fit to the data represent the DO depletion rate in mg $L^{-1}d^{-1}$. On September 16, two sediment samples were collected at Lt. 43 and monitored. The slopes of the fitted lines are very similar yielding SOD values of 0.70 and 0.74 g m^{-2} d^{-1}. These values were adjusted by subtracting the water from the overall chamber results shown in Figure V-3.

Table V-1 presents the results of the SOD experiments measured from August 2 to November 1, 2001. Correlation coefficients squared, R^2, were generally above 0.9 for the SOD chamber measurements. The SOD measurements generally range from 0.30 to 0.80 g m^{-2} d^{-1}. These values are consistent with many of the literature values appearing for rivers and estuaries (as compiled by Porcella, *et al.,* 1985).

Table V-I: Sediment oxygen demands measured in the DWSC.

Date and Location	Chamber Water Depth (cm)	Chamber Δ DO / Δ t (mg L^{-1} d^{-1})	Correlation Coefficient R^2	Chamber Turbidity (NTU)	Adjusted Δ DO / Δ t (mg L^{-1} d^{-1})	SOD (g m^{-2} d^{-1})
8/2/01						
Lt. 38	15	-2.2	0.77	26	-2.2	0.33
LT 43 A	15	-3.2	0.88	30	-3.2	0.49
Lt. 43 B	18	-10.3	0.94	108	-10.3	1.85
LT 48	18	-3.0	0.87	42	-2.9	0.52
8/30/01						
LT 38	14	-3.0	0.95	22	-3.0	0.42
LT 43	19	-2.2	0.95	37	-2.2	0.41
Lt. 48	18	-3.2	0.91	43	-3.2	0.56
Turning Basin	17	-0.1	0.21	25	-0.1	0.01
9/16/01						
LT 38	15	-2.8	1.00	20	-2.7	0.41
LT 43 A	20	-3.8	1.00	24	-3.7	0.74
LT 43 B	16	-4.1	0.99	28	-4.1	0.66
Lt. 48	22	-4.5	0.99	38	-3.8	0.82
10/4/01						
LT 38	18	-1.8	0.94	14	-1.2	0.22
LT 43	16	-3.7	1.00	28	-2.9	0.46
Lt. 48	18	-3.1	0.98	27	-2.5	0.46
Turning Basin	15	-2.4	0.99	25	-2.0	0.31
11/1/01						
Lt. 38	18	-1.8	0.94	21	-1.8	0.32
LT 43	18	-2.0	0.94	19	-1.8	0.32
Lt. 48	20	-2.7	0.93	21	-2.4	0.48
Turning Basin	15	-2.0	0.95	18	-1.8	0.27

Figure V-4 exhibits the SOD values measured during 2001. These results show that the SOD decreases with downstream distance in the DWSC. The measurements also indicate that relatively high values were measured on September 16, 2001. The cause of the these high values is unknown, however, high sediment deposition rates were also measured five days earlier on September 11. These high deposition rates seem to be associated with unusually high ship traffic during the morning. Perhaps the high SOD measured on September 16 at Lt. 43 and Lt. 48 were caused by similar activity prior to the collection of the sediment samples.

The SOD is dependent on the interfacial water velocity. Elevated water velocities can yield high SOD values due to the compression of the diffusion layer or the resuspension of sediments (Whittemore, 1985; Martin and Bella, 1971). Evidence of resuspension effects were observed during chamber tests conducted on August. 2The experiments performed on August 2 were conducted without the internal circulation piping shown in Figure V-1. In addition, one experiment, Lt. 43 B, was conducted without the diffuser plate. Another sediment sample was also collected at the Lt. 43 site. The results in the SOD are compared in Table V-2 below. The lack of a diffuser plate resulted in much higher chamber turbidity and associated SOD. The SOD and the turbidity for Lt. 43 B were both 3.6 times greater than the chamber turbidity. This experiment demonstrates that significant resuspension events can result in elevated oxygen demands near the sediment-water interface. However as shown later, when averaged over the entire water column the effect is relatively small.

Table V-2: Comparison of turbidity and SOD

Sample	Field Turbidity (NTU)	Chamber Turbidity (NTU)	Recirculation Flow Rate (mL/min)	SOD ($g\ m^{-2}\ d^{-1}$)
Lt. 43A	28	30	650	0.5
Lt. 43B	27	108	650	1.8

A plot of SOD vs. turbidity is presented in Figure V-5 also shows the two parameters to be relatively correlated for experiments. While the measured SOD values appear correlated with the turbidity, the variability observed in the data could also be associated with the degree of core disturbance when collecting each sample. The method used here will result in some core disturbance, regardless of the degree of care employed. Cores that were visibly disturbed were discarded until a satisfactory sample was collected as indicated by the turbidity of the water above the sediment in the core.

These results suggest that the SOD is a relatively minor contributor of the total oxygen demand in the DWSC. Using the high measurement of 0.8 $g\ m^{-2}\ d^{-1}$ the oxygen demand exerted on the water column can be estimated by multiplying the SOD by the water depth as shown:

Exerted demand in column = SOD / water depth= 0.8 $g\ m^{-2}\ d^{-1}$ / 11 m = 0.07 mg/L per day

This demand is small compared with the BOD measured in the water column. The oxygen demand for the first day entering the DWSC is often approximately 1 mg/L. Thus, the SOD contributes less than 10% of overall demand in the DWSC. Even for the extreme chamber experiment where the diffuser plate was removed and the recirculation flow was high (chamber turbidity was 108 NTU and the SOD was 1.8 g m^{-2} d^{-1}) the demand exerted in the column would be 0.16 mg/L per day or approximately 15 percent of the oxygen demand.

Sediment Oxygen Demand Estimations using Water Quality Data

The potential sediment oxygen demand was then estimated using a net flow, Q, of 900 cfs and the change of VSS concentrations (ΔVSS) observed between monitoring stations in the DWSC:

$$\text{Potential SOD} = Q \times \Delta VSS \times R_{BOD/VSS} / A_s ,$$

where, $R_{BOD/VSS}$ is 1.1, and A_s is the surface area of the river reach between monitoring stations. The results of these calculations are shown in Table III-4. These estimations suggest that the average potential SOD measured in the DWSC from June through October , 2001 was 4.4 g m^{-2} d^{-1}between Lt. 48 and Lt. 43 and 3.1 g m^{-2} d^{-1} from Lt. 43 to Lt. 38.

As discussed later, the SOD chamber measurements yielded values ranging from 0.2 to 0.8 g m^{-2} d^{-1} with an average of approximately 0.4 g m^{-2} d^{-1}. The difference between these SOD estimates is probably associated with the decay of VSS in the water column while moving downstream.

Table V-3: Estimated SOD from VSS concentrations in the DWSC.

	River Segment	
	Lt. 48 to Lt. 43	Lt. 43 to Lt. 38
Average depth (ft)	24.5	24.5
Average width (ft)	590	600
Length (ft)	9,200	10,100
Average VSS at upper end (mg/L)[1]	4.85	4.15
Average VSS at lower end (mg/L)[1]	4.15	3.60
$\Delta VSS \times R_{BOD/VSS}$[1]	0.77	.60
Potential SOD ($g/m^2/d$)[1]	3.6	2.5

[1]$R_{BOD/VSS}$ is 1.1 as reported in Section III

Table V-4 exhibits the data used to calculate the expected loss of DO associated with the decay of VSS.

$$\text{DO depleted} = BOD_{int}^{0}\, e^{-kt} ,$$

where BOD_{int}^0 is the ultimate BOD associated with the VSS at the upstream end of the river segment ($VSS \times R_{BOD/VSS}$), k is the decay constant (0.118 d^{-1}) for particulate BOD, and t is the travel time. As shown in Table V-4, the DO demand of the VSS while being transported in the water column is close to the expected ultimate DO demand if all the particles settle. Therefore SOD estimates using this approach are questionable and only provide an upper bound for the expected value. The adjusted SOD appearing in Table V-4 represents the lower bound of SOD values. For these cases, similarity of the potential VSS settling loss to the expected decay loss provides a range that is of little value, but does indicate that relatively low SOD levels are expected from chamber studies.

Table III-4: SOD adjusted for decay of VSS in the water column.

	River Segment	
	Lt. 48 to Lt. 43	Lt. 43 to Lt. 38
Average depth (ft)	22	22
Average width (ft)	500	500
Length (ft)	9,200	10,100
Average VSS at upper end (mg/L)[1]	4.85	4.15
Average VSS at lower end (mg/L)[1]	4.15	3.60
Average velocity (ft/s)	0.09	0.09
Travel time (d)	1.17	1.29
Potential DO demand from settling $\Delta VSS \times R_{BOD/VSS}$[1]	0.77	.60
DO demand from VSS decay in the water column	0.68	0.64
Adjusted SOD ($g/m^2/d$)[2]	0.5	-0.2

[1]$R_{BOD/VSS}$ is 1.1 as reported in Section III
[2] Assuming all the VSS that may decay in the water column occurs prior to settling.

The chamber measurements and these estimates indicate that the SOD is relatively low with a representative value being about 0.5 g DO m^{-2} d^{-1}, but certainly below 1 g DO m^{-2} d^{-1}. While there is a high potential SOD associated with settling organic matter, much of this oxygen demand appears to be exerted within the water column. The relatively low values reported here are associated with high resuspension rates that provide opportunity for some, if not most, of the oxygen demand to be exerted in the water column rather than at sediment-water interface.

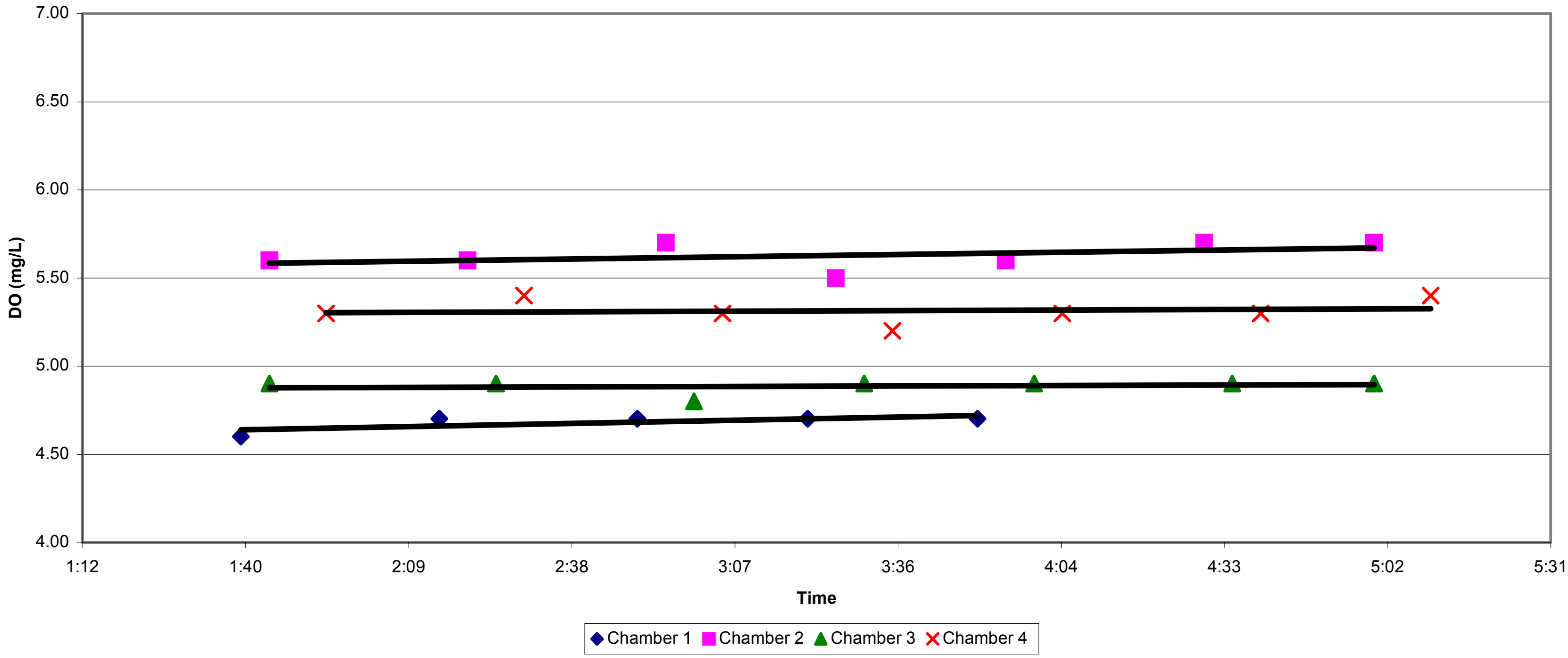

Figure V-2: Dissolved oxygen concentrations during the testing of the chamber apparatus without sediment.

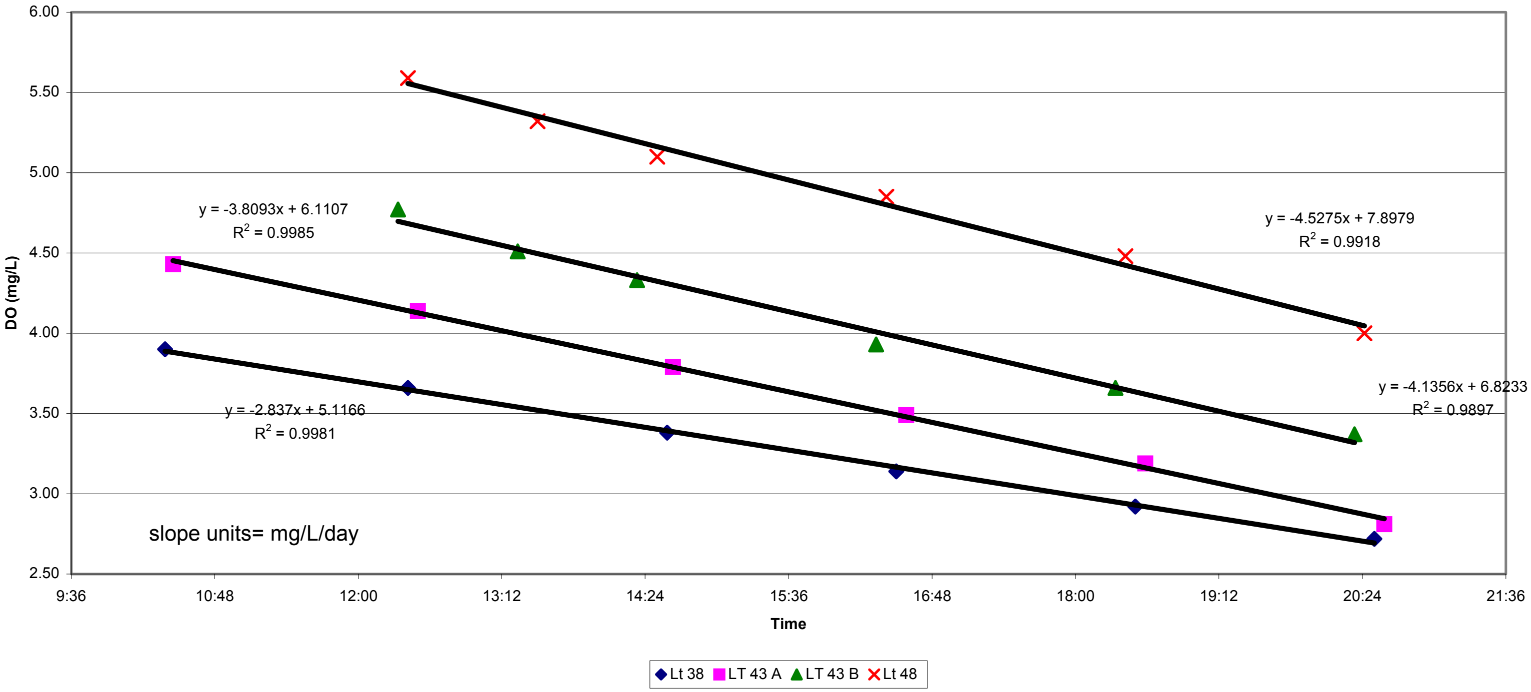

Figure V-3: Oxygen concentrations for SOD chamber experiments performed on September 16, 2001.

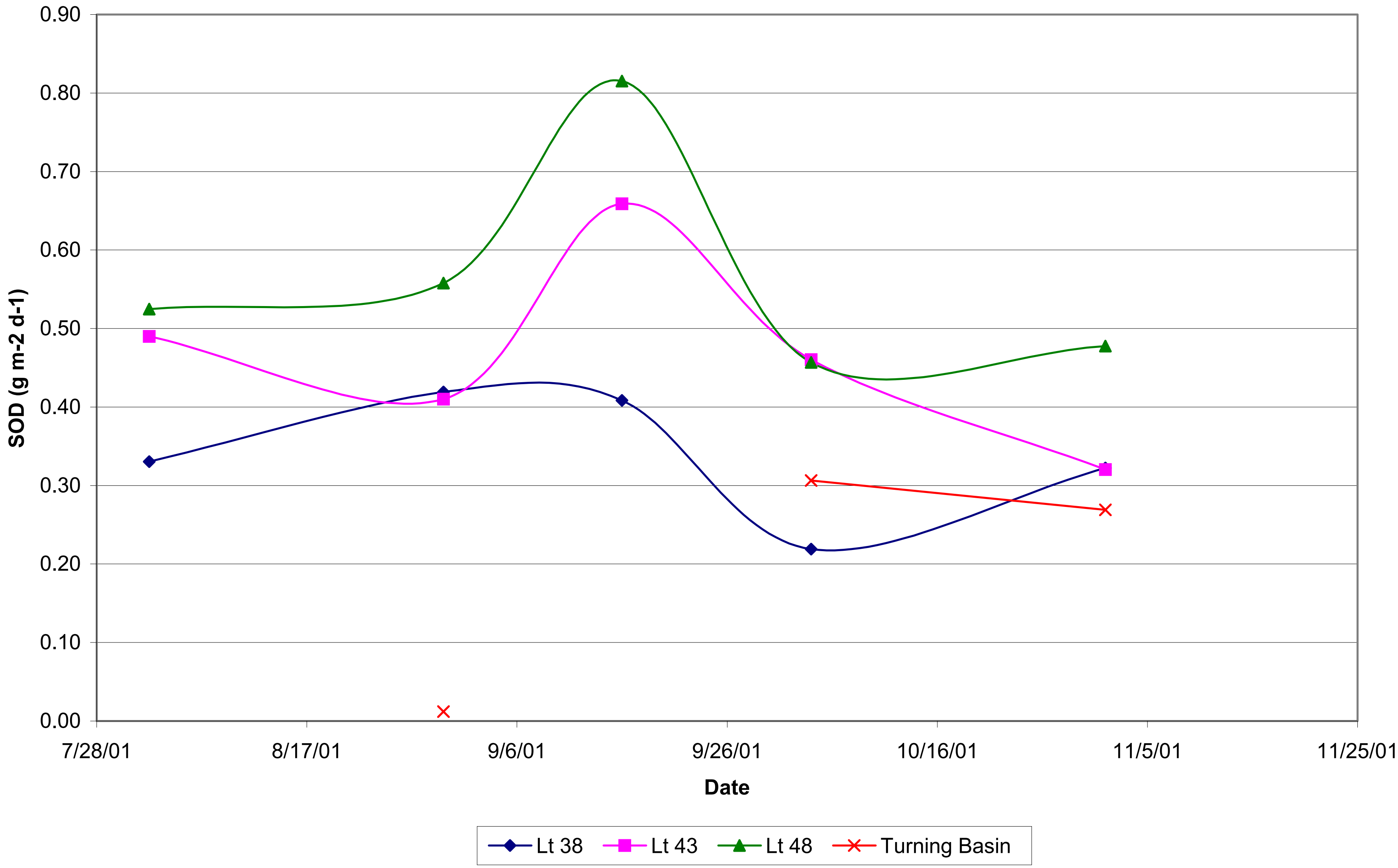

Figure V-4: SOD chamber results during 2001.

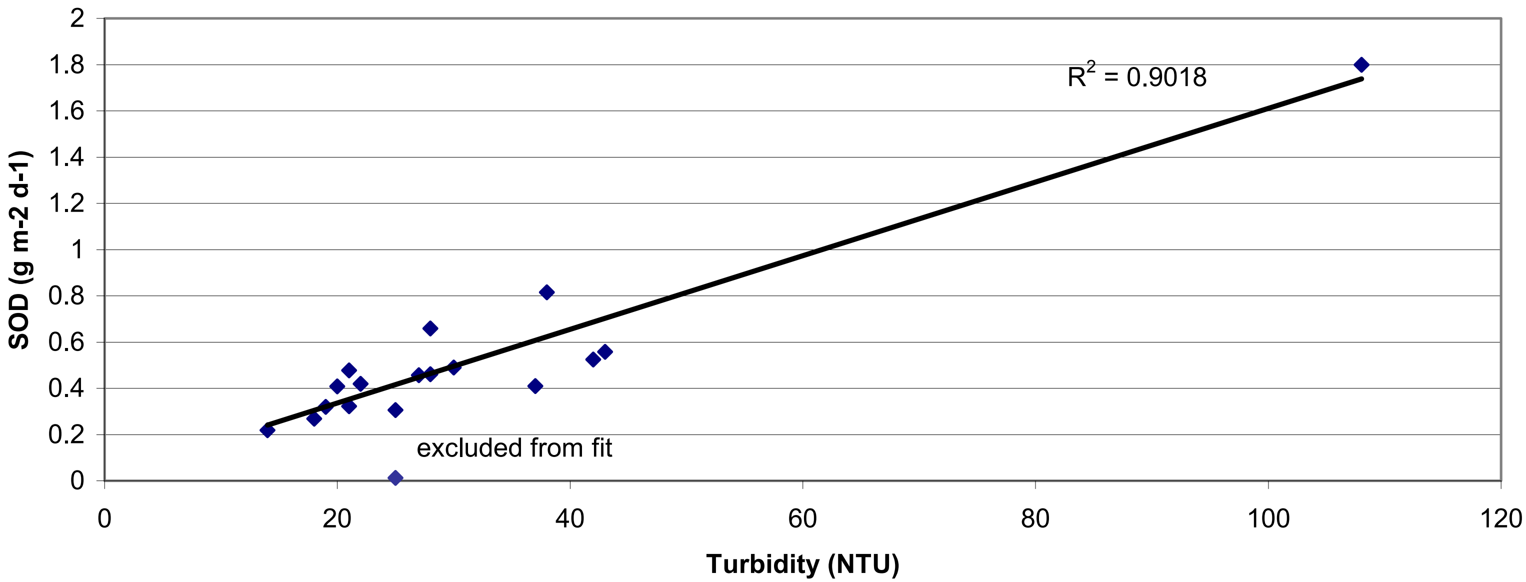

Figure V-5: Chamber SOD vs. chamber turbidity.

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VI. Appendices

Appendix A. Water quality data

Appendix B. Deposition flux data

Appendix C. Settling velocity data

Appendix A. Water quality data

Table A-1: Approximate times when field measurement were performed.

Location	Date								
	6/14/01	6/21/01	7/13/01	7/20/01[1]	8/25/01[1]	9/11/01	9/18/01	10/16/01	10/25/01
	(Neap)	(Spring)	(Neap)	(Spring)	(Neap)	(Neap + 1d)	(Spring + 1d)	(Spring)	(Neap + 1 d)
LT 38 AM Tide	*10:10/14:52*	**9:30/12:05**	*9:55/11:45*	**8:00/10:55**	*10:05/11:25*		**9:55/12:15**	**8:25/10:25**	*10:50/1:50*
LT 38 PM Tide	**17:45**	*16:40/18:15*	**16:05/18:00**	*15:50/17:55*	**14:55/16:55**		*16:15/18:20*	*15:35/17:30*	**18:00/20:40**
LT 43 AM Tide	*9:35/14:25*	**9:00/11:35**	*9:25/11:20*	**8:25/11:15**	*9:45/11:05*	*10:35/12:25*	**9:35/11:55**	**8:55/10:50**	*10:20/1:30*
LT 43 PM Tide	**17:20**	*16:10/18:00*	**15:45/17:40**	*15:35/18:20*	**14:35/16:35**	**16:00/17:05**	*15:55/17:45*	*15:15/17:10*	**17:35/20:20**
LT 48 AM Tide	*9:05/13:55*	**8:30/11:10**	*8:55/11:00*	**7:35/10:30**	*9:10/10:50*	*10:10/12:05*	**9:10/11:30**	**9:30/11:10**	*10:00/1:05*
LT 48 PM Tide	**16:55**	*15:30/17:35*	**15:15/17:20**	*15:20/17:35*	**14:15/16:20**	**15:35/16:45**	*15:40/17:25*	*14:45/16:55*	**17:10/20:00**
San Joaquin River AM Tide	*8:30/13:20*	**8:00/10:40**	*8:25/10:30*	**7:10/10:05**	*8:30/10:30*	*9:45/11:40*	**8:45/11:15**	**9:50/11:35**	*9:30/12:45*
San Joaquin River PM Tide	**16:28**	*14:53/17:15*	**14:50/16:50**	*11:50/15:00/17:15*	**13:55/16:00**	**15:10/16:30**	*15:20/17:00*	*14:25/16:35*	**16:40/19:30**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table A-2: Field Water Temperature °C

Location	Depth (ft)	Date 6/14/01 (Neap)	6/21/01 (Spring)	7/13/01 (Neap)	7/20/01[1] (Spring)	8/25/01[1] (Neap)	9/11/01 (Neap + 1d)	9/18/01 (Spring + 1d)	10/16/01 (Spring)	10/25/01 (Neap + 1 d)
LT 38	3.0		**25.49**	*26.17*	**24.27 / 24.4**	*24.33 / 24.5*		**22.94 / 23.37**	**19.49 / 19.54**	*17.67 / 17.92*
AM Tide	8.2	*23.4*	**25.42 / 25.51**	*25.51 / 25.53*	**24.27 / 24.26**	*24.28 / 24.36*		**22.95 / 22.99**	**19.50 / 19.46**	*17.63 / 17.76*
	16.4	*23.3*	**25.36 / 25.43**	*25.52 / 2.50*	**24.29 / 24.24**	*24.24 / 24.33*		**22.94 / 22.91**	**19.50 / 19.44**	*17.59 / 1769*
	24.6	*23.3*	**25.37 / 25.42**	*25.52 / 25.51*	**24.22 / 24.26**	*24.21 / 24.21*		**22.92 / 22.91**	**19.50 / 19.41**	*17.59 / 17.67*
	B	*23.3*	**25.37 / 25.35**	*25.54 / 25.51*	**24.12 / 24.28**	*24.11 / 24.12*		**22.93 / 22.91**	**19.50 / 19.45**	*17.56 / 17.64*
	3.0		*27.01 / 26*		*26.02 / 25.13*	**25.16 / 25.45**		*23.59 / 23.51*	*19.9 / 19.9*	**18.6 / 18.05**
LT 38	8.2	**23.70 / 23.48**	*26.53 / 26.49*	**26.35 / 26.28**	*25.54 / 24.87*	**24.58 / 25.31**		*23.34 / 23.50*	*19.76 / 19.88*	**17.94 / 18.00**
PM Tide	16.4	**23.34 / 23.33**	*25.64 / 25.7*	**25.76 / 25.9**	*24.25 / 24.27*	**24.20 / 24.40**		*23.13 / 23.14*	*19.69 / 19.82*	**17.60 / 17.57**
	24.6	**23.32 / 23.30**	*25.48 / 25.49*	**25.69 / 25.73**	*24.20 / 24.21*	**24.02 / 24.06**		*22.98 / 23.03*	*19.57 / 19.79*	**17.58 / 17.54**
	B	**23.31 / 23.30**	*25.47 / 25.48*	**25.68 / 25.72**	*24.19 / 24.21*	**23.91 / 23.81**		*22.96 / 23.01*	*19.51 / 19.57*	**17.58 / 17.48**
	3.0	*23.4*		*25.79 / 26.22*	**24.33 / 24.99**	*24.32 / 24.46*	*23.38 / 23.74*	**22.95 / 23.34**	**19.53 / 19.71**	*17.67 / 18.0*
LT 43	8.2	*23.3*	**25.6 / 26.04**	*25.79 / 25.87*	**24.31 / 24.31**	*24.25 / 24.37*	*23.33 / 23. 48*	**22.95 / 22.99**	**19.54 / 19.53**	*17.62 / 17.56*
AM Tide	16.4	*23.3*	**25.55 / 25.87**	*25.75 / 25.79*	**24.31 / 24.25**	*24.21 / 24.21*	*23 .32 / 23.32*	**22.94 / 22.97**	**19.51 / 19.50**	*17.52 / 17.51*
	24.6	*23.3*	**25.48 / 25.74**	*25.72 / 25.74*	**24.30 / 24.20**	*24.19 / 24.21*	*23. 31 / 23 .31*	**22.94 / 22.94**	**19.40 / 19.35**	*17.33 / 17.46*
	B	*23.1*	**25.43 / 25.35**	*25.61 / 25.56*	**24.27 / 24.18**	*24.12 / 24.14*	*23.23 / 23.28*	**22.92 / 22.92**	**19.26 / 19.33**	*17.32 / 17.37*
	3.0	*23.3*	*27.4 / 26.9*	**27.06 / 26.62**	*25.7*	**25.15 / 25.64**	**24.16 / 24.13**	*23.98 / 23.67*	*20.13 / 19.77*	**18.1 / 18.04**
LT 43	8.2	**23.33 / 23.39**	*26.14 / 26.73*	**26.17 / 26.22**	*24.93 / 24.86*	**24.47 / 25.06**	**23.66 / 23.90**	*23.72 / 23..40*	*19.89 / 19.75*	**17.51 / 17.33**
PM Tide	16.4	**23.30 / 23.26**	*25.85 / 26*	**25.82 / 26.08**	*24.26 / 24.26*	**24.22 / 24.19**	**23.39 / 23.38**	*23.00 / 23.15*	*19.53 / 19.65*	**17.53 / 17.24**
	24.6	**23. 28 / 23.26**	*25.7 / 25.74*	**25.78 / 25.85**	*24.22 / 24.23*	**24.13 / 24.06**	**23.35 / 23.35**	*22.97 / 22.96*	*19.40 / 19.43*	**17.14 / 16.94**
	B	**23.25 / 23.25**	*25.47 / 25.48*	**25.71 / 25.71**	*24.17 / 24.19*	**24.10 / 23.95**	**23.32 / 23.32**	*22.94 / 22.95*	*19.32 / 19.32*	**17.11 / 16.74**
	3.0		*26.1*	*25.81 / 26.23*	**24.7**	*24.05 / 24.24*	*22.84 / 23.27*	**22.95 / 23.06**	**19.31 / 19.40**	*16.53 / 17.33*
LT 48	8.2	*23.1*	**26.18 / 26.18**	*25.73 / 25.78*	**24.33 / 24.33**	*23.96 / 24.03*	*22.79 / 23.22*	**22.94 / 23.01**	**19.31 / 19.42**	*16.52 / 16.99*
AM Tide	16.4	*23.1*	**26.17 / 26.13**	*25.67 / 25.76*	**24.31 / 24.22**	*23.89 / 23.97*	*22.72 / 23.02*	**2295 / 23.00**	**19.31 / 19.39**	*16.40 / 16.70*
	24.6	*23.0*	**25.88 / 26.09**	*25.63 / 25.71*	**24.29 / 24.21**	*23.73 / 23.90*	*22.63 / 22.89*	**22.94 / 22.97**	**19.31 / 19.41**	*16.39 / 16.64*
	B	*23.1*	**25.46 / 26.02**	*25.34 / 25.56*	**24.28 / 24.11**	*23.71 / 23.69*	*22.53 / 22.50*	**22.93 / 22.95**	**19.31 / 19.39**	*16.40 / 16.55*
	3.0		*28.1*	**26.7**	*24.98 / 24.9*	**25.26 / 24.99**	**24.3 / 24.31**	*24.19 / 24.14*	*19.05 / 19.99*	**18.56 / 16.85**
LT 48	8.2	**23.44 / 23.66**	*27.01 / 27.47*	**26.48 / 26.02**	*24.30 / 24.93*	**24.68 / 24.68**	**23.53 / 23.93**	*23.17 / 23.19*	*19.62 / 19.88*	**18.52 / 16.88**
PM Tide	16.4	**23.29 / 23.51**	*26.79 / 26.59*	**25.91 / 25.77**	*24.27 / 24.39*	**24.32 / 24.41**	**23.29 / 23.27**	*22.98 / 22.95*	*19.40 / 19.50*	**17.13 / 16.74**
	24.6	**23.23 / 23.57**	*26.45 / 26.31*	**25.71 / 25.70**	*24.28 / 24.27*	**23.91 / 24.24**	**23.14 / 23.11**	*22.94 / 22.91*	*19.37 / 19.38*	**16.86 / 16.74**
	B	**22.90 / 23.45**	*26.34 / 25.93*	**25.62 / 25.65**	*24.24 / 24.16*	**23.81 / 24.06**	**22.72 / 22.67**	*22.91 / 22.91*	*19.39 / 19.41*	**16.37 / 16.69**
San Joaquin River	4.0	*22.2*	**26.01 / 26.4**	*24.22 / 24.49*	**24.09 / 23.82**	*23.35 / 23.44*	*21.91 / 22.22*	**22.70 / 22.44**	**19.22 / 19.68**	*15.62 / 16.12*
AM Tide	8.0	*22.2*	**26.01 / 26.41**	*24.22 / 24.44*	**24.09 / 23.78**	*23.33 / 23.39*	*21.88 / 22.03*	**22.69 / 22.44**	**19.25 / 19.68**	*15.62 / 15.90*
	12.0	*22.2*	**26 / 26.41**	*24.21 / 24.41*	**24.11 / 23.79**	*23.33 / 23. 39*	*21.89 / 21.95*	**22.69 / 22.44**	**19.27 / 19.68**	*15.63 / 15.86*
	16.0	*22.2*	**26 / 26.47**	*24.22 / 24.40*	**23.8**	*23 .33 / 23.39*	*21.89 / 21.94*	**22.66 / 22.43**	**19.28 / 19.69**	*15.63 / 15.83*
San Joaquin River	4.0	**22.50 / 23.40**	*27.43 / 27.7*	**25.28 / 25.10**	*23.87 / 24.55*	**23.71 / 24.23**	**22.87 / 22.81**	*23.07 / 23.20*	*19.93 / 20.05*	**16.19 / 16.48**
PM Tide	8.0	**22.56 / 23.33**	*27.43 / 27.7*	**25.22 / 25.10**	*23.78 / 24.57*	**23.56 / 24.23**	**21.96 / 21.97**	*23.04 / 23.18*	*19.88 / 20.05*	**16.16 / 16.48**
	12.0	**22.44 / 23.35**	*27.46 / 27.69*	**25.08 / 25.13**	*23.87 / 24.57*	**23.44 / 24.24**	**21.93 / 21.97**	*23.04 / 23.18*	*19.88 / 20.04*	**16.29 / 16.48**
	16.0	**22.41 / 23.36**	*27.48 / 27.69*	**25.12 / 25.15**	*23.87 / 24.56*	**23.44 / 24.24**	**21.94 / 21.90**	*23.03 / 23.16*	*19.90 / 20.04*	**16.32 / 16.48**

Table A-2: Field water temperature (°C) measurements

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table A-3: Field pH measurements in the DWSC.

Location	Depth (ft)	Date 6/14/01 (Neap)	6/21/01 (Spring)	7/13/01 (Neap)	7/20/01[1] (Spring)	8/25/01[1] (Neap)	9/11/01 (Neap + 1d)	9/18/01 (Spring + 1d)	10/16/01 (Spring)	10/25/01 (Neap + 1 d)
	3.0					*7.7 / 7.8*		**7.9 / 7.9**	**7.9 / 7.9**	*8.0 / 8.1*
LT 38	8.2					*7.8 / 7.7*		**7.9 / 7.9**	**7.9 / 7.9**	*8.0 / 8.00*

AM Tide	16.4					*7.7 / 7.7*		**7.9 / 7.9**	**7.9 / 7.9**	*8.0 / 8.0*
	24.6					*7.7 / 7.7*		**7.9 / 7.9**	**7.9 / 7.9**	*8.0 / 8.0*
	B					*7.7 / 7.7*		**7.8 / 7.8**	**7.9 / 7.9**	*8.0 / 8.0*
	3.0					**7.9 / 8.0**		*8 / 7.9*	*8 / 8.0*	**8.1 / 8.2**
LT 38	8.2					**7.8 / 7.9**		*7.9 / 7.9*	*7.9 / 7.9*	**8.0 / 8.1**
PM Tide	16.4					**7.7 / 7.7**		*7.9 / 7.9*	*7.9 / 7.9*	**8.0 / 8.0**
	24.6					**7.7 / 7.7**		*7.9 / 7.8*	*7.9 / 7.9*	**8.0 / 8.0**
	B					**7.7 / 7.7**		*7.8 / 7.8*	*7.9 / 7.9*	**8.0 / 8.0**
	3.0					*7.8 / 7.8*	*8.2 / 8.25*	**7.9 / 8.0**	**8.0 / 8.1**	*8.05 / 8.1*
LT 43	8.2					*7.7 / 7.8*	*8.2 / 8.2*	**7.9 / 7.9**	**8.0 / 8.0**	*8.0 / 8.0*
AM Tide	16.4					*7.7 / 7.7*	*8.2 / 8.2*	**7.8 / 7.9**	**7.9 / 8.0**	*8.0 / 8.0*
	24.6					*7.7 / 7.7*	*8.2 / 8.1*	**7.9 / 7.9**	**7.9 / 7.9**	*8.0 / 8.0*
	B					*7.7 / 7.7*	*8.1 / 8.1*	**7.9 / 7.9**	**7.8 / 7.8**	*8.0 / 7.9*
	3.0					**7.9 / 8.05**	**8.3 / 8.3**	*8.2 / 8.0*	*8.2 / 8.0*	**8.2 / 8.2**
LT 43	8.2					**7.7 / 8.0**	**8.2 / 8.2**	*8.0 / 7.9*	*8.1 / 8.0*	**8.1 / 8.0**
PM Tide	16.4					**7.7 / 7.8**	**8.1 / 8.2**	*7.9 / 7.9*	*8.0 / 8.0*	**8.0 / 8.0**
	24.6					**7.6 / 7.7**	**8.1 / 8.2**	*7.9 / 8.0*	*7.9 / 7.9*	**8.0 / 8.0**
	B					**7.6 / 7.8**	**8.1 / 8.1**	*7.9 / 7.9*	*7.9 / 7.9*	**7.9 / 8.0**
	3.0					*7.83 / 7.8*	*8.3 / 8.3*	**8.0 / 8.0**	**7.9 / 7.9**	*8.1 / 8.1*
LT 48	8.2					*7.77 / 7.7*	*8.3 / 8.3*	**8.0 / 8.0**	**7.9 / 7.8**	*8.0 / 8.1*
AM Tide	16.4					*7.78 / 7.7*	*8.2 / 8.2*	**8.0 / 8.0**	**7.9 / 7.8**	*8.1 / 8.0*
	24.6					*7.82 / 7.8*	*8.3 / 8.2*	**8.0 / 8.0**	**7.9 / 7.8**	*8.0 / 8.0*
	B					*7.83 / 7.8*	*8.3 / 8.3*	**8.0 / 7.9**	**7.9 / 7.8**	*8.0 / 8.0*
	3.0					**8 / 8.2**	**8.5 / 8.5**	*8.5 / 8.4*	*8 / 8.2*	**8.3 / 8.1**
LT 48	8.2					**7.8 / 8.0**	**8.3 / 8.4**	*8.2 / 8.1*	*7.9 / 8.1*	**8.2 / 8.1**
PM Tide	16.4					**7.8 / 7.9**	**8.2 / 8.3**	*8.1 / 8.1*	*7.9 / 8.0*	**8.1 / 8.1**
	24.6					**7.8 / 7.9**	**8.2 / 8.2**	*8.2 / 8.0*	*7.9 / 7.9*	**8.1 / 8.1**
	B					**7.7 / 7.8**	**8.2 / 8.2**	*8.1 / 7.9*	*7.8 / 7.8*	**8.1 / 8.0**
San Joaquin River AM Tide	4.0					*8.2 / 7.9*	*8.4 / 8.4*	**8.1 / 8.5**	**8.1 / 8.1**	*8.1 / 8.2*
	8.0					*8.17 / 7.9*	*8.4 / 8.4*	**8.0 / 8.5**	**8.0 / 8.1**	*8.1 / 8.2*
	12.0					*8.16 / 7.9*	*8.4 / 8.4*	**8.0 / 8.5**	**8.0 / 8.1**	*8.1 / 8.1*
	16.0					*8.16 / 7.9*	*8.4 / 8.5*	**8.0 / 8.5**	**8.0 / 8.1**	*8.1 / 8.1*
San Joaquin River PM Tide	4.0					**8.0 / 8.4**	**8.5 / 8.5**	*8.9 / 8.7*	*8.2 / 8.05*	**8.1 / 8.2**
	8.0					**8.0 / 8.4**	**8.4 / 8.4**	*8.9 / 8.8*	*8.2 / 8.02*	**8.2 / 8.2**
	12.0					**7.9 / 8.4**	**8.4 / 8.4**	*8.9 / 8.8*	*8.2 / 8.0*	**8.2 / 8.2**
	16.0					**7.9 / 8.4**	**8.4 / 8.4**	*8.9 / 8.8*	*8.2 / 8.0*	**8.2 / 8.2**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.
[1]Lt Trap 38 was placed at Lt. 45.
[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.
[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table A-4: Field dissolved oxygen measurements in the DWSC (mg/L).

Location	Depth (ft)	Date								
		6/14/01 (Neap)	6/21/01 (Spring)	7/13/01 (Neap)	7/20/01[1] (Spring)	8/25/01[1] (Neap)	9/11/01 (Neap + 1d)	9/18/01 (Spring + 1d)	10/16/01 (Spring)	10/25/01 (Neap + 1 d)
	3.0		**4.2 / 4.3**	*4.8 / 5.5*	**3.7 / 4.3**	*5 / 4.9*		**4.4 / 5.2**	**6.7 / 6.8**	*7.7 / 7.6*
LT 38	8.2	*5.1*	**4.1 / 3.9**	*4.4 / 4.8*	**3.8 /4.0**	*5.0 /5.0*		**4.4 / 4.5**	**6.4 / 6.5**	*7.5 / 7.2*
AM Tide	16.4	*5.1*	**4.0 / 3.7**	*4.3 / 4.5*	**3.6 / 4.0**	*4.9 / 4.9*		**4.3 / 4.3**	**6.4 / 6.5**	*7.4 / 7.2*
	24.6	*5.1*	**4.0 / 3.6**	*4.2 /4.4*	**3.7 / 3.9**	*4.7 / 4.9*		**4.3 / 4.3**	**6.4 / 6.4**	*7.4 / 7.2*
	B	*5.1*	**4.0 / 3.6**	*4.2 /4.1*	**3.8 / 3.4**	*4.5 / 4.3*		**4.2 / 4.2**	**6.4 / 6.2**	*7.3 / 7.1*
	3.0		*5.4 / 5.3*	**5.7 / 6**	*5.8 / 5.2*	**6.6 / 7.4**		*5.4 / 5.4*	*7.4 / 7.0*	**8.5 / 8.7**
LT 38	8.2	**4.4 / 6.55**	*4.8 / 5.4*	**5.1 / 5.46**	*3.8 / 4.5*	**5.2 / 7.4**		*4.8 / 5.2*	*7 / 6.9*	**7.7 / 8**
PM Tide	16.4	**4.59 / 6.75**	*3.8 / 3.9*	**4.1 / 4.0**	*3.7 / 3.7*	**4.8 / 5.5**		*4.5 / 4.4*	*6.8 / 6.8*	**7.2 / 7.4**
	24.6	**4.9 / 7.06**	*3.6 / 3.5*	**3.8 / 3.7**	*3.6 / 3.6*	**4.9 / 5.0**		*4.2 / 4.2*	*6.6 / 6.8*	**7.1 / 7.2**
	B	**5.09 / 7.63**	*3.5 / 3.5*	**3.8 /3.7**	*3.3 / 3.2*	**4.7 / 5.2**		*4.2 / 4.1*	*6.6 / 6.5*	**7.1 / 7.1**
	3.0	*4.6*	**5.0**	*5 / 5.3*	**3.8 / 4.4**	*5.1 / 5.5*	*5.7 / 6.1*	**5 / 6.0**	**7.4 / 8.2**	*7.4 / 8.1*
LT 43	8.2	*4.5*	**4.0 / 5.1**	*4.5 / 4.8*	**3.7 / 3.6**	*4.6 / 4.7*	*5.5 / 5.6*	**4.9 / 5.1**	**7.3 / 7.6**	*7.4 / 7.3*
AM Tide	16.4	*4.4*	**3.8 / 4.4**	*4.3 / 4.5*	**3.7 / 3.7**	*4.4 / 4.3*	*5.4 / 5.3*	**4.9 / 5.0**	**7.3 / 7.4**	*7.4 / 7.3*
	24.6	*4.4*	**3.55 / 3.7**	*4.2 / 4.1*	**3.6 / 3.7**	*4.3 / 4.3*	*5.4 / 5.2*	**4.8 / 5.0**	**7.1 / 6.9**	*7.7 / 7.1*
	B	*4.2*	**3.1 / 2**	*4.0 / 4.1*	**3.8 / 3.5**	*4.2 / 4.3*	*5.4 / 5.2*	**4.7 / 4.8**	**6.5 / 5.9**	*7.6 / 7.6*
	3.0	*4.5*	*7.3 / 5.9*	**7.2 / 7**	*5.5 / 4.7*	**6.7 / 7.8**	**6.2 / 6.3**	*7.4 / 5.9*	*10.2 / 7.9*	**7.5 / 8.6**
LT 43	8.2	**4.45 / 4.48**	*4.6 / 5.66*	**5.3 / 5.6**	*4.4 / 4.5*	**5.0 / 6.4**	**5.6 / 5.8**	*5.7 / 5.5*	*8.9 / 7.8*	**7.5 / 7.6**
PM Tide	16.4	**4.26 / 4.53**	*3.1 / 3.64*	**4.6 / 5.2**	*3.6 / 3.6*	**4.5 / 4.7**	**5.1 / 5.2**	*5.1 / 5.1*	*8.0 / 7.7*	**7.4 / 7.6**
	24.6	**4.2 / 4.23**	*3.0 / 3.15*	**4.5 / 4.6**	*3.5 / 3.5*	**3.9 / 4.8**	**5.0 / 5.1**	*5.1 / 4.8*	*7.3 / 7.3*	**7.6 / 7.7**
	B	**3.94 / 3.82**	*2 / 2.3*	**4.5 / 4.3**	*3.3 / 3.3*	**3.8 / 4.9**	**5.0 / 4.6**	*4.9 / 4.6*	*6.8 / 6.6*	**7.6 / 7.6**
	3.0		**4.5 / 4.8**	*5.7 / 5.8*	**4.3 / 4.1**	*5.8 / 5.8*	*6.6 / 6.7*	**6.3 / 6.5**	**7.2 / 7.0**	*8.2 / 8.2*
LT 48	8.2	*4.8*	**5 / 3.8**	*5.4 / 5.8*	**4.4 / 4.1**	*5.5 / 5.9*	*6.5 / 6.7*	**6.2 / 6.2**	**7.1 / 6.8**	*8.1 / 8.0*
AM Tide	16.4	*4.8*	**4.9 / 3.7**	*5.2 / 5.2*	**4.4 / 4.0**	*5.6 / 5.2*	*6.6 / 6.4*	**6.4 / 6.2**	**7.0 / 6.8**	*8.1 / 8.0*
	24.6	*4.7*	**3.7 / 3.6**	*5.3 / 5.2*	**4.3 / 4.05**	*5.9 / 5.4*	*6.7 / 6.3*	**6.2 / 6.2**	**7.0 / 6.8**	*8.1 / 8.0*
	B	*4.7*	**2.3 / 3.5**	*5.5 / 5.3*	**4.1 / 4.1**	*5.9 / 5.6*	*6.7 / 6.6*	**5.9 / 6.4**	**7.0 / 6.7**	*8.1 / 8.1*
	3.0		*7.2*	**8.0 / 9.0**	*5.3 / 5.9*	**7.9 / 8.5**	**7.8 / 7.7**	*9.5 / 8.9*	*8.4 / 9.9*	**8.9 / 8.6**
LT 48	8.2	**4.82 / 4.38**	*4.4 / 5.6*	**6.35 / 6**	*4.7 / 5.2*	**6.0 / 6.8**	**6.2 / 7.0**	*7.6 / 6.8*	*7.8 / 9.2*	**8.4 / 8.4**
PM Tide	16.4	**4.5 / 4.21**	*4.0 / 3.7*	**6.5 / 5.9**	*4.7 / 4.2*	**5.6 / 6.4**	**5.9 / 6.3**	*7.2 / 7.0*	*7.3 / 8.1*	**7.8 / 8.5**
	24.6	**4.46 / 4.19**	*3.6 / 3.5*	**6.8 / 6.5**	*4.5 / 4.1*	**5.6 / 6.0**	**6.1 / 6.1**	*7.5 / 6.3*	*7.2 / 7.1*	**8.0 / 8.5**
	B	**4.42 / 4.27**	*3.3 / 2.7*	**6.8 / 7.1**	*4.2 / 3.9*	**5.5 / 7.5**	**6.2 / 6.0**	*7.2 / 6.2*	*7.8*	**8.0 / 8.4**
San Joaquin River	4.0	*8.4*	**4.1 / 4.44**	*7.11 / 7.3*	**5.5/4.2/5.05**	*7.2 / 7.21*	*7.45 / 7.75*	**6.9 / 8.6**	**7.4 / 8.2**	*8.7 / 8.2*
AM Tide	8.0	*8.4*	**4.0 / 4.0**	*7.0 / 7.1*	**5.5/4.2/5.0**	*7.14 / 7.0*	*7.5 / 7.5*	**6.8 / 8.6**	**7.4 / 8.2**	*8.6 / 8.1*
	12.0	*8.3*	**4.0 / 4.0**	*7.0 / 7.0*	**5.5/4.2/5.05**	*7.08 / 7.0*	*7.5 / 7.4*	**6.8 / 8.6**	**7.4 / 8.2**	*8.6 / 8.1*
	16.0	*8.5*	**4.0 / 3.9**	*6.9 / 6.9*	**5.5/4.2/5.05**	*7.03 / 7 .0*	*7.5 / 7.3*	**6.9 / 8.6**	**7.5 / 8.2**	*8.6 / 8.1*
San Joaquin River	4.0	**8.46 / 10.22**	*5.16 / 5.3*	**9.3 / 8.3**	*6.05 / 5.95*	**8.65 / 8.9**	**8.9 / 8.45**	*10.3 / 9.7*	*8.6 / 8.6*	**8.8 / 8.8**
PM Tide	8.0	**8.44 / 10.06**	*5.4 / 5.2*	**9.0 / 8.3**	*5.9 / 6.0*	**7.4 / 8.8**	**7.5 / 7.2**	*9.9 / 9.6*	*8.4 / 8.5*	**8.8 / 8.7**
	12.0	**7.7 / 9.93**	*5.4 / 5.2*	**8.7 / 8.3**	*5.9 / 5.9*	**7.1 / 8.8**	**7.1 / 7.1**	*9.6 / 9.6*	*8.4 / 8.5*	**8.8 / 8.7**
	16.0	**7.51 / 9.87**	*5.3 /5.1*	**8.7 / 8.3**	*5.9 / 5.9*	**7.0 / 8.6**	**7.0 / 7.0**	*9.8 / 9.6*	*8.4 / 8.4*	**8.9 / 8.6**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.
[1]Lt Trap 38 was placed at Lt. 45.
[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.
[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table A-5: Field measurements of turbidity in the DWSC (NTU)

Location	Depth (ft)	Date								
		6/14/01 (Neap)	6/21/01 (Spring)	7/13/01 (Neap)	7/20/01[1] (Spring)	8/25/01[1] (Neap)	9/11/01 (Neap + 1d)	9/18/01 (Spring + 1d)	10/16/01 (Spring)	10/25/01 (Neap + 1 d)
	3.0			*15 / 15*	**18 / 18**	*14 / 14*		**19 / 14**	**15 / 12**	*18 / 21*
LT 38	8.2	*28*	**20 / 21**	*14 / 15*	**19 / 14**	*19 / 18*		**16 / 16**	**20 / 16**	*20 / 19*
AM Tide	16.4	*27*	**22 / 23**	*16 /16*	**23 / 15**	*24 / 19*		**17 / 20**	**20 / 16**	*21 / 23*

	24.6	*31*	**24 / 24**	*16 /16*	**25 / 15**	*31 / 24*		**23 / 21**	**29 / 19**	*21 / 23*
	B	*33*	**24 / 26**	*18 / 19*	**24 / 28**	*38 / 42*		**24 / 25**	**34 / 26**	*26 / 28*
LT 38 PM Tide	3.0	*21*		**14 / 14**	*14 / 15*	**13 / 13**		*14 / 14*	*17 / 16*	**17 / 14**
	8.2	**25 / 26**		**14 / 14**	*14 / 12*	**16 / 15**		*15 / 14*	*15 / 16*	**16 / 13**
	16.4	**26 / 27**		**19 / 15**	*13 / 14*	**19 / 16**		*15 / 16*	*17 / 15*	**16 / 15**
	24.6	**29 / 30**		**19 / 21**	*16 / 16*	**27 / 17**		*18 / 16*	*19 / 15*	**23 / 17**
	B	**29 / 30**		**28 / 21**	*23 / 20*	**52 / 41**		*21 / 19*	*20 / 20*	**26 / 23**
LT 43 AM Tide	3.0	**22**		*16 / 15*	**22 / 18**	*15 / 14*	*16 / 15*	**21 / 14**	**10.0 / 15**	*16 / 16*
	8.2	*28*	**20 / 15**	*15 / 15*	**20 / 15**	*17 / 17*	*20 / 16*	**21 / 18**	**12.0 / 13**	*16 / 16*
	16.4	*34*	**20 / 17**	*15 / 14*	**22 / 16**	*16 / 17*	*21 / 21*	**20 / 19**	**11.0 / 14**	*14 / 15*
	24.6	*32*	**20 / 20**	*16 / 15*	**24 / 17**	*21 / 18*	*21 / 21*	**22 / 22**	**14 / 20**	*22 / 20*
	B	*39*	**27 / 29**	*20 / 20*	**22 / 22**	*31 / 27*	*30 / 25*	**41 / 40**	**40 / 46**	*31 / 35*
LT 43 PM Tide	3.0	*25*		**14 / 14**	*15 / 17*	**14 / 16**	**15 / 15**	*14 / 14*	*15 / 14*	**15 / 13**
	8.2	**31 / 23**		**14 / 13**	*14 / 15*	**14 / 14**	**16 / 15**	*15 / 14*	*13 / 15*	**15 / 14**
	16.4	**/ 28**		**14 / 15**	*14 / 16*	**15 / 17**	**18 / 17**	*18 / 15*	*37241.0*	**17 / 14**
	24.6	**34 / 39**		**17 / 19**	*16 / 16*	**24 / 19**	**18 / 18**	*19 / 19*	*20 / 19*	**19 / 16**
	B	**41 / 53**		**23 / 19**	*24 / 18*	**43 / 26**	**28 / 37**	*31 / 25*	*34 / 29*	**30 / 24**
LT 48 AM Tide	3.0			*16 / 18*	**22 / 17**	*19 / 15*	*16 / 13*	**18 / 17**	**19.0 / 14**	*20 / 12*
	8.2	*31*	**17 / 29**	*17 / 17*	**14 / 20**	*20 / 17*	*20 / 16*	**19 / 18**	**25 / 23**	*18 / 18*
	16.4	*28*	**17 / 29**	*18 / 16*	**14 / 20**	*21 / 18*	*23 / 18*	**19 / 19**	**26 / 24**	*20 / 20*
	24.6	*29*	**18 / 32**	*20 / 17*	**15 / 21**	*27 / 21*	*23 / 18*	**22 / 20**	**29 / 25**	*20 / 26*
	B	*31*	**23 / 32**	*29 / 20*	**22 / 24**	*31 / 35*	*33 / 30*	**45 / 26**	**40 / 30**	*27 / 35*
LT 48 PM Tide	3.0			**15 / 15**	*21 / 16*	**11.0/18.0**	**15 / 16**	*14 / 13*	*14 / 13*	**12.0 / 16**
	8.2	**28 / 30**		**16 / 13**	*24 / 15*	**13 / 20**	**18 / 17**	*20 / 16*	*14 / 14*	**13 / 15**
	16.4	**24 / 31**		**18 / 15**	*22 / 16*	**15 / 22**	**19 / 20**	*24 / 20*	*15 / 13*	**17 /17**
	24.6	**26 / 31**		**20 / 20**	*22 / 17*	**19 / 24**	**21 / 19**	*29 / 22*	*16 / 14*	**18 / 16**
	B	**37 / 51**		**28 / 26**	*23 / 19*	**30 / 35**	**28 / 35**	*29.0*	*36 / 28*	**23 / 19**
San Joaquin River AM Tide	4.0	*39*	**19 / 28**	*22 / 24*	**16 / 23**	*32 / 27*	*26 / 21*	**26 / 35**	**26 / 24**	*29 / 20*
	8.0	*39*	**24 / 28**	*26 / 27*	**16 / 25**	*33 / 27*	*24 / 23*	**23 / 33**	**27 / 26**	*30 / 20*
	12.0	*37*	**21 / 33**	*28 / 26*	**16 / 25**	*31 / 27*	*28 / 24*	**27 / 32**	**24 / 25**	*30 / 19*
	16.0	*37*	**22 / 32**	*27 / 26*	**15 / 25**	*32 / 28*	*32 / 26*	**24 / 31**	**25 / 26**	*31 / 20*
San Joaquin River PM Tide	4.0	**34 / 47**		**30 / 44**	*26 / 60*	**24 / 40**	**21 / 21**	*32 / 28*	*25 / 17*	**19 / 24**
	8.0	**29 / 47**		**32 / 42**	*26 / 36*	**23 / 37**	**21 / 24**	*21 /29*	*24 / 18*	**19 / 21**
	12.0	**30 / 45**		**38 / 40**	*26 / 38*	**24 / 36**	**25 / 23**	*28 / 30*	*22 / 17*	**18 / 23**
	16.0	**37 / 48**		**35 / 42**	*25 / 46*	**30 / 36**	**27 / 24**	*29 / 30*	*22 / 18*	**18 / 21**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.
[1]Lt Trap 38 was placed at Lt. 45.
[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment. Equipment failure on 6/14.
[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table A-6: Secchi depth measurements in the DWSC.

Location	Date								
	6/14/01	6/21/01	7/13/01	7/20/01[1]	8/25/01[1]	9/11/01[2]	9/18/01	10/16/01	10/25/01
	(Neap)	(Spring)	(Neap)	(Spring)	(Neap)	(Neap + 1d)	(Spring + 1d)	(Spring)	(Neap + 1 d)
LT 38	*1.5*	**1.8 / 1.8**	*2 / 2.2*	**1.5 / 2.1**	*2.0 /2.0*		**2.0 / 2.4**	**2.0 / 2.0**	*2.0 / 2.2*
AM Tide									
LT 38	**1.6 / 1.5**	*1.6 / 1.5*	**2 / 2.2**	*2.3 / 2.0*	**2.3 / 2.0**		*2.2 / 2.3*	*2.0 / 1.9*	**2.0**
PM Tide									
LT 43	*1.5*	**1.7 / 2**	*1.9 / 1.7*	**1.6 / 2.0**	*2.4 / 2.1*	*2.1 / 2.3*	**1.8 / 2.5**	**2.2 / 2.0**	*2.0 / 2.4*
AM Tide									

LT 43	**1.4 / 1.6**	*1.8 / 1.6*	**2.5 / 2.2**	*2.3 / 1.7*	**2.2 / 2.0**	**2.5**	*2.3 / 2.2*	*2.1 / 2.0*	**2.2**
PM Tide									
LT 48	*1.6*	**2 / 1.8**	*1.9 / 2.3*	**2.0 / 1.8**	*1.8 / 1.8*	*1.9 / 1.9*	**1.9 / 2.0**	**1.6 / 1.7**	*2.0 / 2.0*
AM Tide									
LT 48	**1.5**	*1.7 / 1.4*	**1.8 / 1.9**	*1.5 / 2.0*	**2.0 / 2.0**	**2.0 / 2.5**	*1.8 / 2.0*	*2.0 / 2.0*	**1.8**
PM Tide									
San Joaquin River[3]	*1.0*	**1.5 / 1.5**	*1.4 / 1.4*	**1.5 / 1.4**	*1.4 / 1.5*	*1.6 / 1.5*	**1.6 / 1.4**	**1.7 / 1.6**	*1.5 / 2.0*
AM Tide									
San Joaquin River[3]	**1.2**	*1.3 /1.4*	**1.5 / 1**	*1.4 / 1.3*	**1.5 / 1.3**	**1.8 / 1.8**	*1.4 / 1.3*	*1.8 / 1.8*	**1.6**
PM Tide									

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table A-7: TSS concentrations (mg/L) in the DWSC and San Joaquin River at the USGS UVM Station.

Location	Depth	Date								
	(ft)	6/14/01	6/21/01	7/13/01	7/20/01[1]	8/25/01[1]	9/11/01	9/18/01	10/16/01	10/25/01
		(Neap)	(Spring)	(Neap)	(Spring)	(Neap)	(Neap + 1d)	(Spring + 1d)	(Spring)	(Neap + 1 d)
LT 38	8.2	*21.4*	**14.8**	*15.6*	**18.4**	*18.4*	*NA*[2]	**16.8**	**20.1**	*NA*[3]
AM Tide	16.4	*22.2*	**20.0**	*16.7*	**20.7**	*21.3*	*NA*	**19.7**	**20.1**	*NA*[3]
	24.6	*27.6*	**21.6**	*15.7*	**20.3**	*30.9*	*NA*	**21.1**	**28.5**	*NA*[3]
	B	*34.0*	**23.6**	*29.1*	**29.2**	*39.9*	*NA*	**28.5**	**42.5**	*NA*[3]
LT 38	8.2	**19.2**	*14.1*	**14.3**	*14.5*	**15.7**	**NA**	*12.2*	*16.8*	**13.7**
PM Tide	16.4	**25.0**	*17.7*	**19.3**	*14.0*	**18.5**	**NA**	*14.6*	*17.1*	**15.5**
	24.6	**24.0**	*15.6*	**19.5**	*16.5*	**22.9**	**NA**	*18.0*	*18.7*	**19.1**
	B	**22.6**	*20.5*	**23.8**	*23.5*	**61.3**	**NA**	*21.8*	*22.5*	**26.3**
LT 43	8.2	*27.9*	**14.9**	*13.2*	**16.7**	*16.6*	*18.9*	**19.4**	**12.7**	*14.8*
AM Tide	16.4	*29.4*	**15.7**	*13.7*	**19.7**	*17.4*	*21.6*	**20.1**	**13.9**	*13.5*
	24.6	*30.0*	**19.6**	*16.7*	**26.3**	*19.3*	*23.7*	**23.7**	**19.1**	*21.5*
	B	*40.5*	**29.6**	*20.8*	**26.3**	*38.1*	*33.2*	**54.8**	**48.4**	*39.1*
LT 43	8.2	**20.8**	*16.0*	**14.3**	*13.6*	**13.2**	**15.2**	*13.7*	*15.2*	**13.1**
PM Tide	16.4	**25.1**	*17.2*	**18.6**	*15.1*	**16.3**	**17.6**	*16.9*	*14.8*	**16.1**
	24.6	**35.2**	*21.6*	**18.4**	*16.0*	**25.5**	**18.9**	*19.8*	*19.5*	**16.8**
	B	**53.2**	*28.6*	**23.9**	*23.5*	**30.0**	**35.6**	*31.8*	*30.0*	**51.2**
LT 48	8.2	*33.1*	**25.6**	*17.9*	**14.0**	*19.6*	*20.7*	**20.2**	**35.6**	*20.3*
AM Tide	16.4	*24.0*	**28.9**	*20.0*	**16.5**	*21.2*	*22.9*	**20.8**	**35.5**	*22.4*
	24.6	*32.9*	**29.4**	*24.1*	**17.4**	*26.7*	*23.2*	**22.8**	**37.5**	*30.9*
	B	*31.3*	**32.4**	*29.9*	**24.9**	*38.8*	*40.1*	**44.0**	**44.9**	*38.3*
LT 48	8.2	**25.6**	*20.7*	**17.1**	*20.7*	**17.9**	**17.3**	*15.7*	*16.1*	**13.5**
PM Tide	16.4	**27.8**	*23.0*	**21.1**	*21.5*	**18.5**	**20.4**	*23.5*	*16.7*	**17.5**
	24.6	**31.0**	*25.8*	**24.8**	*20.8*	**23.6**	**18.2**	*30.9*	*17.6*	**16.5**
	B	**49.6**	*32.6*	**33.2**	*24.8*	**44.0**	**36.1**	*32.3*	*38.4*	**22.5**
San Joaquin River	AM	*51.3*	**26.2**	*28.6*	**25.8**	*29.2*	*30.3*	**40.6**	**28.4**	*24.7*
	PM	**46.8**	*35.3*	**51.6**	*30.8*	**32.8**	**25.5**	*34.9*	*21.5*	**21.7**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table A-8: VSS concentrations (mg/L) in the DWSC.

Location	Depth	Date								
	(ft)	6/14/01	6/21/01	7/13/01	7/20/01[1]	8/25/01[1]	9/11/01	9/18/01	10/16/01	10/25/01
		(Neap)	(Spring)	(Neap)	(Spring)	(Neap)	(Neap + 1d)	(Spring + 1d)	(Spring)	(Neap + 1 d)
LT 38	8.2	*3.2*	**2.4**	*3.2*	**2.5**	*3.9*	*NA*[2]	**3.1**	**4.4**	*NA*[3]
AM Tide	16.4	*3.2*	**3.2**	*3.6*	**2.9**	*4.3*	*NA*	**3.5**	**4.0**	*NA*[3]
	24.6	*4.0*	**3.2**	*3.3*	**3.1**	*5.6*	*NA*	**3.8**	**5.1**	*NA*[3]
	B	*4.8*	**2.9**	*5.5*	**4.0**	*6.9*	*NA*	**4.8**	**6.7**	*NA*[3]
LT 38	8.2	**3.8**	*1.7*	**2.9**	*2.8*	**3.9**	**NA**	*2.8*	*3.7*	**3.3**
PM Tide	16.4	**3.7**	*2.7*	**3.7**	*2.7*	**3.5**	**NA**	*2.9*	*3.9*	**2.8**
	24.6	**3.8**	*3.1*	**3.6**	*2.7*	**3.5**	**NA**	*3.1*	*3.6*	**2.8**
	B	**3.0**	*3.2*	**3.8**	*3.7*	**8.5**	**NA**	*3.5*	*4.1*	**4.5**
LT 43	8.2	*4.5*	**3.5**	*3.8*	**2.5**	*4.0*	*4.0*	**3.5**	**3.7**	*1.9*
AM Tide	16.4	*4.6*	**3.5**	*2.9*	**2.5**	*3.5*	*3.9*	**3.5**	**3.3**	*2.4*
	24.6	*4.3*	**4.4**	*3.7*	**3.3**	*3.8*	*4.5*	**3.7**	**4.1**	*2.8*
	B	*5.2*	**6.0**	*4.0*	**3.3**	*5.6*	*5.5*	**8.0**	**7.3**	*4.7*
LT 43	8.2	**3.8**	*5.3*	**3.5**	*2.7*	**3.1**	**3.3**	*3.2*	*4.3*	**2.5**
PM Tide	16.4	**4.5**	*5.2*	**4.1**	*2.8*	**2.9**	**3.5**	*3.5*	*3.5*	**3.3**
	24.6	**4.4**	*5.2*	**3.9**	*2.8*	**4.1**	**3.3**	*3.7*	*3.6*	**3.3**
	B	**8.6**	*6.0*	**4.7**	*3.7*	**4.8**	**5.7**	*5.0*	*5.1*	**6.8**
LT 48	8.2	*5.5*	**4.0**	*3.9*	**2.7**	*4.3*	*4.8*	**4.0**	**5.3**	*3.2*
AM Tide	16.4	*4.8*	**5.4**	*4.7*	**2.9**	*3.9*	*4.8*	**4.5**	**5.5**	*3.1*
	24.6	*5.5*	**5.0**	*4.9*	**3.1**	*5.6*	*4.4*	**4.6**	**5.7**	*4.4*
	B	*3.9*	**5.0**	*5.4*	**4.0**	*6.5*	*7.1*	**6.8**	**6.7**	*5.1*
LT 48	8.2	**4.2**	*6.0*	**4.8**	*4.3*	**4.5**	**4.7**	*3.7*	*4.7*	**3.9**
PM Tide	16.4	**5.3**	*5.4*	**5.7**	*4.1*	**4.0**	**4.3**	*4.5*	*3.3*	**3.5**
	24.6	**6.4**	*5.4*	**6.4**	*3.7*	**4.4**	**3.4**	*4.9*	*3.5*	**3.2**
	B	**8.0**	*6.4*	**7.8**	*4.3*	**7.6**	**6.5**	*5.7*	*6.3*	**3.3**
San Joaquin River	AM	*8.3*	**6.2**	*6.7*	**3.7**	*4.5*	*5.2*	**5.9**	**3.7**	*2.9*
	PM	**9.4**	*7.6*	**10.8**	*4.2*	**6.0**	**4.3**	*6.6*	*3.7*	**2.5**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table A-9: Chlorophyll *a* concentrations (mg/L) in the DWSC.

	(ft)	6/14/01 (Neap)	6/21/01 (Spring)	7/13/01 (Neap)	7/20/01[1] (Spring)	8/25/01[1] (Neap)	9/11/01 (Neap + 1d)	9/18/01 (Spring + 1d)	10/16/01 (Spring)	10/25/01 (Neap + 1 d)
LT 38	8.2	*4.1*	**7.5**	*11.7*	**9.1**	*17.1*	*NA*[2]	**8.7**	**20.6**	*14.3*
AM Tide	16.4	*4.0*	**6.4**	*10.7*	**8.5**	*20.0*	*NA*	**9.2**	**20.3**	*12.2*
	24.6	*5.6*	**5.9**	*9.6*	**8.0**	*18.4*	*NA*	**8.6**	**21.1**	*11.7*
	B	*5.4*	**5.9**	*10.1*	**8.0**	*18.8*	*NA*	**8.1**	**20.7**	*11.0*
LT 38	8.2	**4.8**	*12.8*	**16.6**	*9.6*	**30.6**	**NA**	*12.3*	*24.3*	**18.3**
PM Tide	16.4	**4.0**	*7.5*	**9.6**	*8.0*	**26.9**	**NA**	*8.5*	*23.0*	**12.6**
	24.6	**4.6**	*6.4*	**11.7**	*6.9*	**16.1**	**NA**	*7.3*	*21.5*	**12.8**
	B	**4.9**	*5.9*	**10.1**	*8.0*	**26.5**	**NA**	*8.0*	*18.5*	**12.2**
LT 43	8.2	*7.0*	**15.0**	*21.9*	**9.6**	*15.2*	*12.5*	**13.4**	**35.2**	*16.6*
AM Tide	16.4	*7.0*	**10.1**	*16.0*	**9.1**	*13.7*	*11.5*	**13.4**	**32.0**	*15.2*
	24.6	*6.4*	**6.4**	*12.3*	**10.1**	*15.2*	*13.1*	**12.2**	**24.8**	*14.7*
	B	*6.3*	**6.4**	*15.0*	**8.0**	*14.2*	*14.4*	**12.4**	**21.3**	*13.4*
LT 43	8.2	**8.4**	*26.2*	**29.9**	*9.1*	**22.1**	**12.7**	*16.2*	*41.3*	**13.3**
PM Tide	16.4	**6.7**	*9.6*	**30.4**	*6.9*	**15.0**	**10.7**	*11.4*	*28.5*	**12.0**
	24.6	**8.5**	*8.5*	**31.0**	*5.9*	**12.0**	**11.0**	*10.4*	*21.7*	**12.2**
	B	**5.6**	*8.5*	**31.5**	*5.9*	**19.3**	**12.6**	*11.1*	*19.8*	**12.8**
LT 48	8.2	*15.0*	**21.4**	*43.8*	**8.0**	*23.8*	*24.6*	**28.9**	**25.9**	*22.8*
AM Tide	16.4	*15.8*	**20.8**	*39.5*	**NA**	*23.3*	*22.8*	**30.7**	**23.3**	*14.1*
	24.6	*14.0*	**16.6**	*41.1*	**10.1**	*26.5*	*22.8*	**25.1**	**26.4**	*14.1*
	B	*19.9*	**13.4**	*48.1*	**11.7**	*31.6*	*22.0*	**29.5**	**27.7**	*15.3*
LT 48	8.2	**19.4**	*30.4*	**46.5**	*16.6*	**30.7**	**26.1**	*32.3*	*38.7*	**22.5**
PM Tide	16.4	**24.7**	*20.8*	**50.7**	*17.6*	**28.0**	**19.9**	*32.2*	*28.0*	**15.2**
	24.6	**24.0**	*17.6*	**60.3**	*14.4*	**20.6**	**19.7**	*32.2*	*23.5*	**16.1**
	B	**33.4**	*11.7*	**64.6**	*15.0*	**26.2**	**19.7**	*30.7*	*24.3*	**15.3**
San Joaquin River	AM	*31.0*	**16.0**	*77.4*	**17.1**	*34.8*	*31.5*	**41.3**	**26.2**	*12.6*
	PM	**24.7**	*31.2*	**80.6**	**12.8**	**44.1**	**25.8**	*69.4*	*28.8*	**12.6**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table A-10: Chlorophyll *a* and Pheophytin *a* concentrations in the DWSC.

Location	Depth (ft)	Date 6/14/01 (Neap)	6/21/01 (Spring)	7/13/01 (Neap)	7/20/01[1] (Spring)	8/25/01[1] (Neap)	9/11/01 (Neap + 1d)	9/18/01 (Spring + 1d)	10/16/01 (Spring)	10/25/01 (Neap + 1 d)
LT 38	8.2	*15.3*	**18.7**	*25.0*	**26.5**	*31.6*	*NA*[2]	**19.7**	**36.2**	*28.5*
AM Tide	16.4	*14.0*	**19.8**	*23.5*	**31.0**	*34.6*	*NA*	**19.7**	**34.1**	*28.9*
	24.6	*15.4*	**20.6**	*20.9*	**26.5**	*37.1*	*NA*	**20.2**	**35.8**	*28.5*
	B	*14.7*	**21.7**	*23.9*	**35.5**	*46.6*	*NA*	**22.7**	**34.8**	*31.1*
LT 38	8.2	**18.6**	*24.7*	**29.2**	*23.9*	**39.8**	**NA**	*20.9*	*34.8*	**29.3**
PM Tide	16.4	**16.5**	*25.0*	**31.0**	*25.0*	**32.2**	**NA**	*19.1*	*35.5*	**26.0**
	24.6	**20.2**	*25.0*	**25.8**	*30.7*	**32.0**	**NA**	*18.9*	*33.7*	**25.8**
	B	**21.5**	*26.9*	**30.7**	*33.3*	**64.7**	**NA**	*20.6*	*32.9*	**26.6**
LT 43	8.2	*22.4*	**35.9**	*37.8*	**29.2**	*27.0*	*31.6*	**32.3**	**45.2**	*26.5*
AM Tide	16.4	*24.6*	**31.8**	*32.5*	**33.6**	*28.4*	*33.0*	**29.9**	**40.1**	*24.1*
	24.6	*22.8*	**31.0**	*31.8*	**35.9**	*29.9*	*33.7*	**31.6**	**36.6**	*27.1*
	B	*25.4*	**34.4**	*32.1*	**33.6**	*29.5*	*38.0*	**42.1**	**45.1**	*31.0*
LT 43	8.2	**25.5**	*49.7*	**45.2**	*22.4*	**33.4**	**27.7**	*27.1*	*49.8*	**21.5**
PM Tide	16.4	**28.2**	*44.9*	**52.3**	*24.3*	**30.2**	**27.3**	*27.6*	*39.5*	**21.6**
	24.6	**37.1**	*43.7*	**55.7**	*26.9*	**24.1**	**30.8**	*27.6*	*36.3*	**20.4**
	B	**26.7**	*45.2*	**59.1**	*34.4*	**42.8**	**38.5**	*34.0*	*39.4*	**27.3**
LT 48	8.2	*40.6*	**49.7**	*66.5*	**27.3**	*35.7*	*50.2*	**45.1**	**36.6**	*24.3*
AM Tide	16.4	*37.7*	**53.5**	*75.1*	**NA**	*41.5*	*47.1*	**49.6**	**31.6**	*23.8*
	24.6	*30.6*	**47.5**	*63.2*	**35.1**	*39.5*	*48.0*	**52.4**	**40.2**	*26.0*
	B	*45.4*	**53.5**	*80.4*	**41.9**	*52.2*	*57.1*	**60.6**	**44.1**	*28.5*
LT 48	8.2	**42.5**	*55.7*	**62.4**	*39.6*	**40.2**	**45.6**	*51.7*	*47.3*	**29.7**
PM Tide	16.4	**55.6**	*51.6*	**71.8**	*40.7*	**40.6**	**40.7**	*55.2*	*36.3*	**23.1**
	24.6	**49.5**	*51.6*	**87.1**	*37.8*	**33.4**	**43.1**	*54.4*	*33.3*	**22.5**
	B	**72.9**	*51.2*	**96.1**	*41.5*	**45.6**	**52.6**	*63.7*	*41.0*	**24.8**
San Joaquin River	AM	*45.6*	**41.7**	*112.1*	**46.7**	*51.9*	*61.8*	**72.5**	**34.8**	*21.2*
	PM	**36.9**	*69.2*	**118.5**	**29.5**	**59.6**	**54.2**	*94.3*	*36.3*	**20.5**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Appendix B. Trapped Sediment Deposition Fluxes.

Table B-1: TSS Deposition fluxes in the DWSC.

Location	Depth	Date								
	(ft)	6/14/01	6/21/01	7/13/01	7/20/01[1]	8/25/01[1]	9/11/01	9/18/01	10/16/01	10/25/01
		(Neap)	(Spring)	(Neap)	(Spring)	(Neap)	(Neap + 1d)	(Spring + 1d)	(Spring)	(Neap + 1 d)
LT 38	8.2	*12.0*	**6.2**	*10.3*	**11.6**	*7.6*	*NA*[2]	**9.0**	**7.2**	*15.5*
AM Tide	16.4	*19.8*	**10.6**	*16.1*	**19.3**	*12.5*	*NA*	**11.6**	**10.7**	*18.2*
	24.6	*27.5*	**15.3**	*23.6*	**32.9**	*22.5*	*NA*	**17.8**	**16.5**	*35.2*
	B	*33.1*	**23.2**	*31.9*	**na**	*51.6*	*NA*	**35.9**	**49.9**	*na*
LT 38	8.2	**3.9**	*3.8*	**3.2**	*4.1*	**4.0**	**NA**	*2.2*	*8.5*	**5.1**
PM Tide	16.4	**8.8**	*5.8*	**8.2**	*7.6*	**7.2**	**NA**	*3.1*	*12.2*	**10.2**
	24.6	**15.2**	*9.5*	**13.4**	*11.4*	**13.0**	**NA**	*7.1*	*18.1*	**18.5**
	B	**17.3**	*13.6*	**23.9**	*16.0*	**49.6**	**NA**	*30.5*	*40.0*	**17.8**
LT 43	8.2	*9.8*	**4.2**	*7.8*	**5.2**	*5.7*	*15.1*	**9.0**	**3.7**	*4.2*
AM Tide	16.4	*12.6*	**6.0**	*10.9*	**8.6**	*8.7*	*31.9*	**12.6**	**5.2**	*6.3*
	24.6	*18.6*	**9.6**	*17.2*	**14.3**	*15.6*	*62.2*	**18.9**	**11.6**	*15.5*
	B	*24.6*	**17.3**	*22.8*	**79.6**	*39.5*	*na*	**67.1**	**45.6**	*na*
LT 43	8.2	**3.6**	*5.1*	**3.6**	*3.3*	**3.0**	**na**	*4.9*	*5.0*	**2.7**
PM Tide	16.4	**8.3**	*8.9*	**6.6**	*7.5*	**6.9**	**7.1**	*7.0*	*6.3*	**10.1**
	24.6	**17.9**	*13.6*	**16.8**	*12.2*	**17.3**	**15.2**	*12.7*	*11.2*	**28.8**
	B	**32.2**	*21.5*	**20.9**	*18.4*	**32.7**	**57.1**	*40.7*	*33.4*	**47.4**
LT 48	8.2	*10.5*	**28.3**	*9.8*	**29.7**	*12.3*	*29.7*	**23.6**	**40.4**	*17.6*
AM Tide	16.4	*21.3*	**56.4**	*19.4*	**51.2**	*22.4*	*56.9*	**31.7**	**55.9**	*32.0*
	24.6	*39.2*	**76.5**	*31.3*	**66.8**	*41.9*	*86.1*	**43.9**	**67.4**	*50.1*
	B	*81.8*	**100.7**	*na*	**na**	*83.1*	*213.6*	**89.3**	**79.8**	*na*
LT 48	8.2	**11.8**	*15.5*	**na**	*9.2*	**7.1**	**6.2**	*11.4*	*6.5*	**14.7**
PM Tide	16.4	**24.6**	*31.3*	**17**	*19.9*	**11.4**	**15.6**	*16.5*	*9.4*	**23.7**
	24.6	**39.9**	*38.4*	**37**	*29.9*	**23.1**	**33.8**	*28.2*	*14.2*	**29.3**
	B	**135.0**	*54.3*	**113**	*80.6*	**50.3**	**75.7**	*74.7*	*26.1*	**37.8**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table B-2: Deposition Flux (g/ m^2hr)of VSS in the DWSC.

Location	Depth	Date								
	(ft)	6/14/01	6/21/01	7/13/01	7/20/01[1]	8/25/01[1]	9/11/01	9/18/01	10/16/01	10/25/01
		(Neap)	(Spring)	(Neap)	(Spring)	(Neap)	(Neap + 1d)	(Spring + 1d)	(Spring)	(Neap + 1 d)
LT 38	8.2	*1.3*	**1.0**	*1.4*	**1.4**	*1.1*	*NA*[2]	**1.2**	**0.8**	*1.7*
AM Tide	16.4	*2.0*	**1.6**	*2.2*	**2.2**	*1.7*	*NA*	**1.6**	**1.2**	*2.2*
	24.6	*3.0*	**2.1**	*3.4*	**3.3**	*2.9*	*NA*	**2.2**	**1.9**	*3.7*
	B	*3.3*	**2.9**	*4.2*	**NA**	*6.3*	*NA*	**4.3**	**5.3**	*NA*
LT 38	8.2	**0.6**	*0.8*	**0.5**	*0.6*	**0.7**	**NA**	*0.3*	*1.1*	**0.7**
PM Tide	16.4	**1.0**	*1.4*	**1.1**	*1.1*	**1.1**	**NA**	*0.4*	*1.5*	**1.4**
	24.6	**1.6**	*1.6*	**1.6**	*1.5*	**1.9**	**NA**	*0.9*	*2.4*	**2.2**
	B	**1.7**	*1.7*	**2.8**	*1.7*	**5.8**	**NA**	*3.5*	*4.8*	**1.9**
LT 43	8.2	*1.5*	**0.7**	*1.1*	**0.6**	*0.8*	*1.6*	**1.1**	**0.6**	*0.7*
AM Tide	16.4	*1.7*	**1.1**	*1.7*	**1.2**	*1.2*	*3.3*	**1.5**	**0.7**	*0.9*
	24.6	*2.5*	**1.5**	*3.6*	**1.6**	*2.4*	*6.0*	**2.2**	**1.4**	*1.9*
	B	*2.8*	**2.2**	*3.2*	**8.3**	*4.5*	**NA**	**7.3**	**4.3**	*NA*
LT 43	8.2	**0.6**	*0.8*	**0.7**	*0.3*	**0.5**	**NA**	*0.7*	*0.7*	**0.4**
PM Tide	16.4	**1.1**	*1.2*	**1.0**	*1.0*	**0.9**	**0.7**	*0.9*	*1.0*	**0.9**
	24.6	**2.1**	*1.9*	**2.2**	*1.6*	**2.3**	**1.7**	*1.5*	*1.3*	**1.8**
	B	**3.4**	*2.5*	**3.2**	*1.9*	**4.1**	**5.6**	*4.2*	*3.7*	**4.4**
LT 48	8.2	*1.1*	**3.1**	*1.3*	**3.1**	*1.5*	*2.9*	**2.7**	**4.0**	*1.7*
AM Tide	16.4	*2.5*	**6.0**	*2.3*	**5.2**	*2.5*	*5.3*	**3.4**	**5.5**	*2.8*
	24.6	*4.3*	**8.4**	*3.6*	**6.6**	*4.6*	*7.7*	**4.6**	**6.5**	*4.4*
	B	*8.0*	**10.1**	*NA*	**NA**	*8.8*	*18.2*	**9.1**	**7.6**	*NA*
LT 48	8.2	**1.2**	*1.6*	**NA**	*1.2*	**1.0**	**0.8**	*1.4*	*1.2*	**1.4**
PM Tide	16.4	**2.4**	*2.9*	**2**	*2.1*	**1.4**	**1.8**	*1.8*	*1.3*	**2.3**
	24.6	**3.5**	*3.3*	**4**	*3.2*	**2.7**	**3.7**	*3.2*	*1.9*	**2.7**
	B	**10.7**	*4.9*	**12**	*8.2*	**4.0**	**7.2**	*7.5*	*3.0*	**3.5**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table B-3: Chlorophyll *a* deposition fluxes (mg/m^2 hr) the DWSC.

Location	Depth	Date								
	(ft)	6/14/01 (Neap)	6/21/01 (Spring)	7/13/01 (Neap)	7/20/01[1] (Spring)	8/25/01[1] (Neap)	9/11/01 (Neap + 1d)	9/18/01 (Spring + 1d)	10/16/01 (Spring)	10/25/01 (Neap + 1 d)
LT 38	8.2	*0.7*	**0.7**	*1.4*	**1.1**	*2.0*	*NA*[2]	**0.9**	**1.9**	*1.4*
AM Tide	16.4	*0.7*	**1.0**	*1.4*	**1.3**	*2.9*	*NA*	**0.9**	**2.1**	*1.8*
	24.6	*1.0*	**1.0**	*2.1*	**2.5**	*3.3*	*NA*	**1.4**	**3.0**	*2.4*
	B	*1.4*	**0.9**	*1.6*	**NA**	*5.1*	*NA*	**1.8**	**3.8**	*NA*
LT 38	8.2	**0.5**	*0.7*	**1.4**	*1.0*	**2.9**	**NA**	*0.8*	*2.5*	**1.5**
PM Tide	16.4	**0.7**	*0.8*	**1.5**	*1.1*	**2.5**	**NA**	*0.9*	*2.6*	**1.3**
	24.6	**0.6**	*0.6*	**1.7**	*1.3*	**3.3**	**NA**	*0.9*	*2.9*	**1.8**
	B	**0.4**	*0.9*	**1.8**	*1.7*	**4.0**	**NA**	*1.7*	*4.6*	**2.9**
LT 43	8.2	*1.0*	**1.3**	*2.7*	**0.5**	*1.7*	*2.0*	**1.2**	**2.4**	*1.4*
AM Tide	16.4	*1.5*	**1.2**	*2.6*	**1.0**	*1.9*	*2.6*	**1.9**	**2.4**	*1.4*
	24.6	*1.4*	**1.7**	*2.5*	**1.2**	*1.7*	*9.0*	**2.2**	**3.1**	*1.4*
	B	*1.5*	**1.1**	*2.3*	**1.8**	*3.5*	**NA**	**3.4**	**3.4**	*2.6*
LT 43	8.2	**0.6**	*0.5*	**3.4**	*0.7*	**2.4**	**NA**	*1.4*	*2.9*	**1.7**
PM Tide	16.4	**1.0**	*1.1*	**3.6**	*1.4*	**2.1**	**1.5**	*1.5*	*2.7*	**1.2**
	24.6	**0.9**	*0.9*	**5.1**	*1.1*	**2.6**	**2.0**	*2.0*	*2.8*	**1.7**
	B	**1.5**	*0.5*	**3.2**	*1.1*	**3.5**	**3.6**	*3.0*	*4.2*	**2.9**
LT 48	8.2	*2.8*	**2.7**	*7.8*	**3.0**	*3.4*	*3.5*	**4.1**	**4.1**	*2.0*
AM Tide	16.4	*2.6*	**3.9**	*10.0*	**4.7**	*4.3*	*5.6*	**5.4**	**4.5**	*2.6*
	24.6	*3.0*	**5.0**	*11.1*	**5.9**	*5.9*	*2.7*	**5.9**	**4.9**	*3.1*
	B	*5.3*	**5.0**	*NA*	**NA**	*7.3*	*14.5*	**8.2**	**6.9**	*NA*
LT 48	8.2	**3.1**	*2.8*	**NA**	*2.7*	**4.1**	**3.5**	*5.6*	*10.7*	**2.9**
PM Tide	16.4	**4.0**	*2.2*	**9**	*2.4*	**4.1**	**5.8**	*5.9*	*8.0*	**1.8**
	24.6	**4.7**	*2.9*	**12**	*2.5*	**5.1**	**5.6**	*6.9*	*9.9*	**4.1**
	B	**9.2**	*1.5*	**21**	*10.7*	**7.9**	**9.0**	*8.7*	*10.9*	**5.8**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table B-4: Chlorophyll *a* and pheophytin *a* fluxes (mg/m²hr) the DWSC.

Location	Depth	Date								
	(ft)	6/14/01	6/21/01	7/13/01	7/20/01[1]	8/25/01[1]	9/11/01	9/18/01	10/16/01	10/25/01
		(Neap)	(Spring)	(Neap)	(Spring)	(Neap)	(Neap + 1d)	(Spring + 1d)	(Spring)	(Neap + 1 d)
LT 38	8.2	*4.0*	**3.6**	*5.5*	**8.3**	*6.1*	*NA*[2]	**4.8**	**4.6**	*5.6*
AM Tide	16.4	*5.1*	**5.0**	*7.2*	**10.2**	*8.1*	*NA*	**6.7**	**6.4**	*7.6*
	24.6	*6.8*	**6.7**	*9.9*	**17.3**	*13.5*	*NA*	**8.8**	**9.2**	*11.8*
	B	*8.8*	**8.3**	*12.4*	**NA**	*24.3*	*NA*	**14.8**	**20.5**	*NA*
LT 38	8.2	**1.9**	*2.4*	**3.3**	*3.4*	**5.6**	**NA**	*2.1*	*5.4*	**4.0**
PM Tide	16.4	**3.3**	*4.6*	**5.7**	*5.8*	**6.3**	**NA**	*2.1*	*7.5*	**5.5**
	24.6	**4.9**	*3.7*	**7.2**	*5.6*	**10.3**	**NA**	*3.6*	*9.8*	**8.3**
	B	**5.1**	*6.7*	**11.0**	*8.2*	**23.6**	**NA**	*12.5*	*18.2*	**15.9**
LT 43	8.2	*4.5*	**5.3**	*8.0*	**3.2**	*4.4*	*8.9*	**5.9**	**4.5**	*2.8*
AM Tide	16.4	*5.3*	**6.0**	*9.9*	**6.2**	*6.2*	*13.5*	**7.9**	**4.7**	*3.8*
	24.6	*7.2*	**7.8**	*13.5*	**8.3**	*8.5*	*35.0*	**10.8**	**7.3**	*6.5*
	B	*8.3*	**9.2**	*15.4*	**20.8**	*19.1*	**NA**	**32.0**	**17.4**	*11.3*
LT 43	8.2	**2.4**	*1.9*	**6.6**	*2.1*	**4.7**	**NA**	*3.9*	*5.4*	**3.0**
PM Tide	16.4	**5.4**	*3.9*	**9.3**	*7.2*	**6.5**	**5.5**	*5.5*	*6.2*	**3.3**
	24.6	**8.1**	*5.0*	**16.9**	*5.9*	**9.7**	**8.2**	*8.9*	*7.7*	**5.7**
	B	**13.2**	*3.3*	**19.5**	*7.8*	**16.8**	**24.7**	*21.7*	*16.9*	**14.7**
LT 48	8.2	*7.4*	**16.6**	*16.0*	**17.9**	*8.6*	*14.2*	**15.2**	**14.1**	*5.9*
AM Tide	16.4	*12.3*	**28.4**	*22.4*	**27.2**	*11.7*	*22.8*	**19.5**	**17.2**	*9.7*
	24.6	*18.1*	**39.2**	*29.9*	**31.2**	*20.5*	*21.9*	**25.0**	**20.7**	*13.8*
	B	*30.4*	**43.5**	*NA*	**NA**	*29.6*	*63.9*	**46.0**	**27.8**	*NA*
LT 48	8.2	**8.5**	*6.9*	**NA**	*7.7*	**7.0**	**7.2**	*11.3*	*13.4*	**5.9**
PM Tide	16.4	**12.2**	*8.7*	**21**	*8.8*	**9.5**	**10.7**	*15.2*	*10.9*	**7.6**
	24.6	**17.8**	*13.2*	**29**	*17.3*	**13.4**	**18.9**	*20.9*	*14.9*	**10.0**
	B	**41.5**	*9.5*	**63**	*48.4*	**24.1**	**35.2**	*45.4*	*19.0*	**16.9**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Appendix C. Settling Velocities of Trapped Sediment.

Table C-1. Settling velocities of TSS (m/hr) in the DWSC.

Location	Depth (ft)	Date 6/14/01 (Neap)	6/21/01 (Spring)	7/13/01 (Neap)	7/20/01[1] (Spring)	8/25/01[1] (Neap)	9/11/01 (Neap + 1d)	9/18/01 (Spring + 1d)	10/16/01 (Spring)	10/25/01 (Neap + 1 d)
LT 38	8.2	*0.56*	**0.42**	*0.66*	**0.63**	*0.41*	*NA*[2]	**0.53**	**0.36**	*NA*[3]
AM Tide	16.4	*0.89*	**0.53**	*0.96*	**0.94**	*0.59*	*NA*	**0.59**	**0.53**	*NA*[3]
	24.6	*0.99*	**0.71**	*1.50*	**1.62**	*0.73*	*NA*	**0.84**	**0.58**	*NA*[3]
	B	*0.97*	**0.98**	*1.10*	**NA**	*1.29*	*NA*	**1.26**	**1.17**	*NA*[3]
LT 38	8.2	**0.20**	*0.27*	**0.22**	*0.28*	**0.25**	**NA**	*0.18*	*0.50*	**0.37**
PM Tide	16.4	**0.35**	*0.33*	**0.42**	*0.54*	**0.39**	**NA**	*0.21*	*0.71*	**0.66**
	24.6	**0.63**	*0.61*	**0.69**	*0.69*	**0.57**	**NA**	*0.39*	*0.97*	**0.97**
	B	**0.76**	*0.66*	**1.00**	*0.68*	**0.81**	**NA**	*1.40*	*1.77*	**0.68**
LT 43	8.2	*0.35*	**0.28**	*0.59*	**0.31**	*0.35*	*0.80*	**0.47**	**0.29**	*0.28*
AM Tide	16.4	*0.43*	**0.38**	*0.80*	**0.44**	*0.50*	*1.48*	**0.63**	**0.37**	*0.47*
	24.6	*0.62*	**0.49**	*1.03*	**0.54**	*0.81*	*2.62*	**0.80**	**0.61**	*0.72*
	B	*0.61*	**0.58**	*1.10*	**3.03**	*1.04*	**NA**	**1.22**	**0.94**	*NA*
LT 43	8.2	**0.17**	*0.32*	**0.25**	*0.24*	**0.23**	**NA**	*0.36*	*0.33*	**0.20**
PM Tide	16.4	**0.33**	*0.52*	**0.36**	*0.50*	**0.42**	**0.40**	*0.41*	*0.43*	**0.63**
	24.6	**0.51**	*0.63*	**0.91**	*0.76*	**0.68**	**0.80**	*0.64*	*0.58*	**1.71**
	B	**0.61**	*0.75*	**0.87**	*0.78*	**1.09**	**1.60**	*1.28*	*1.11*	**0.92**
LT 48	8.2	*0.32*	**1.11**	*0.55*	**2.12**	*0.63*	*1.44*	**1.17**	**1.13**	*0.87*
AM Tide	16.4	*0.89*	**1.95**	*0.97*	**3.10**	*1.05*	*2.48*	**1.53**	**1.58**	*1.43*
	24.6	*1.19*	**2.60**	*1.30*	**3.83**	*1.57*	*3.71*	**1.93**	**1.80**	*1.62*
	B	*2.62*	**3.11**	*NA*	**NA**	*2.14*	*5.32*	**2.03**	**1.78**	*NA*
LT 48	8.2	**0.46**	*0.75*	**NA**	*0.45*	**0.40**	**0.36**	*0.73*	*0.40*	**1.09**
PM Tide	16.4	**0.88**	*1.36*	**0.81**	*0.93*	**0.62**	**0.76**	*0.70*	*0.57*	**1.36**
	24.6	**1.29**	*1.49*	**1.48**	*1.44*	**0.98**	**1.86**	*0.91*	*0.81*	**1.77**
	B	**2.72**	*1.67*	**3.41**	*3.25*	**1.14**	**2.09**	*2.31*	*1.17*	**1.68**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table C-2: Settling velocities (m/hr) of VSS in the DWSC

Location	Depth	Date								
	(ft)	6/14/01	6/21/01	7/13/01	7/20/01[1]	8/25/01[1]	9/11/01	9/18/01	10/16/01	10/25/01
		(Neap)	(Spring)	(Neap)	(Spring)	(Neap)	(Neap + 1d)	(Spring + 1d)	(Spring)	(Neap + 1 d)
LT 38	8.2	*0.42*	**0.41**	*0.43*	**0.55**	*0.29*	*NA*[2]	**0.38**	**0.18**	*NA*[3]
AM Tide	16.4	*0.64*	**0.48**	*0.60*	**0.74**	*0.39*	*NA*	**0.45**	**0.31**	*NA*[3]
	24.6	*0.75*	**0.65**	*1.03*	**1.09**	*0.52*	*NA*	**0.58**	**0.37**	*NA*[3]
	B	*0.69*	**1.00**	*0.76*	**NA**	*0.91*	*NA*	**0.90**	**0.79**	*NA*[3]
LT 38	8.2	**0.16**	*0.45*	**0.16**	*0.22*	**0.19**	**NA**	*0.11*	*0.29*	**0.21**
PM Tide	16.4	**0.28**	*0.51*	**0.29**	*0.41*	**0.31**	**NA**	*0.15*	*0.39*	**0.49**
	24.6	**0.42**	*0.53*	**0.44**	*0.56*	**0.55**	**NA**	*0.29*	*0.65*	**0.79**
	B	**0.58**	*0.52*	**0.74**	*0.46*	**0.68**	**NA**	*0.99*	*1.16*	**0.42**
LT 43	8.2	*0.34*	**0.20**	*0.29*	**0.25**	*0.20*	*0.41*	**0.31**	**0.15**	*0.35*
AM Tide	16.4	*0.38*	**0.33**	*0.60*	**0.47**	*0.35*	*0.86*	**0.44**	**0.22**	*0.38*
	24.6	*0.57*	**0.35**	*0.98*	**0.49**	*0.63*	*1.32*	**0.61**	**0.34**	*0.66*
	B	*0.54*	**0.37**	*0.80*	**2.50**	*0.80*	**NA**	**0.92**	**0.59**	*NA3*
LT 43	8.2	**0.16**	*0.14*	**0.19**	*0.13*	**0.18**	**NA**	*0.20*	*0.17*	**0.16**
PM Tide	16.4	**0.24**	*0.23*	**0.26**	*0.35*	**0.31**	**0.19**	*0.25*	*0.30*	**0.26**
	24.6	**0.47**	*0.36*	**0.58**	*0.57*	**0.58**	**0.52**	*0.41*	*0.35*	**0.55**
	B	**0.40**	*0.42*	**0.68**	*0.50*	**0.85**	**0.98**	*0.84*	*0.74*	**0.65**
LT 48	8.2	*0.19*	**0.78**	*0.33*	**1.18**	*0.35*	*0.60*	**0.66**	**0.76**	*0.53*
AM Tide	16.4	*0.53*	**1.11**	*0.47*	**1.78**	*0.66*	*1.10*	**0.76**	**1.01**	*0.92*
	24.6	*0.77*	**1.67**	*0.73*	**2.13**	*0.83*	*1.76*	**1.00**	**1.13**	*0.99*
	B	*2.07*	**2.01**	*NA*	**NA**	*1.35*	*2.58*	**1.35**	**1.14**	*NA3*
LT 48	8.2	**0.29**	*0.27*	**NA**	*0.27*	**0.23**	**0.18**	*0.37*	*0.25*	**0.36**
PM Tide	16.4	**0.45**	*0.53*	**0.40**	*0.52*	**0.36**	**0.42**	*0.41*	*0.40*	**0.66**
	24.6	**0.55**	*0.62*	**0.66**	*0.85*	**0.61**	**1.09**	*0.65*	*0.54*	**0.85**
	B	**1.34**	*0.76*	**1.55**	*1.93*	**0.53**	**1.10**	*1.31*	*0.79*	**1.06**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table C-3: Chlorophyll *a* settling velocities (m/hr) in the DWSC.

	(ft)	6/14/01 (Neap)	6/21/01 (Spring)	7/13/01 (Neap)	7/20/01[1] (Spring)	8/25/01[1] (Neap)	9/11/01 (Neap + 1d)	9/18/01 (Spring + 1d)	10/16/01 (Spring)	10/25/01 (Neap + 1 d)
LT 38	8.2	*0.16*	**0.10**	*0.12*	**0.12**	*0.12*	*NA*[2]	**0.10**	**0.09**	*0.10*
AM Tide	16.4	*0.19*	**0.15**	*0.13*	**0.16**	*0.15*	*NA*	**0.10**	**0.10**	*0.14*
	24.6	*0.18*	**0.17**	*0.22*	**0.31**	*0.18*	*NA*	**0.17**	**0.14**	*0.21*
	B	*0.27*	**0.15**	*0.16*	**NA**	*0.27*	*NA*	**0.22**	**0.18**	*NA*
LT 38	8.2	**0.11**	*0.05*	**0.09**	*0.11*	**0.10**	**NA**	*0.06*	*0.10*	**0.08**
PM Tide	16.4	**0.17**	*0.10*	**0.15**	*0.13*	**0.09**	**NA**	*0.11*	*0.11*	**0.11**
	24.6	**0.14**	*0.10*	**0.15**	*0.18*	**0.20**	**NA**	*0.13*	*0.13*	**0.14**
	B	**0.08**	*0.15*	**0.18**	*0.22*	**0.15**	**NA**	*0.21*	*0.25*	**0.24**
LT 43	8.2	*0.14*	**0.08**	*0.12*	**0.05**	*0.11*	*0.16*	**0.09**	**0.07**	*0.08*
AM Tide	16.4	*0.21*	**0.12**	*0.16*	**0.11**	*0.14*	*0.22*	**0.14**	**0.07**	*0.09*
	24.6	*0.21*	**0.26**	*0.20*	**0.12**	*0.11*	*0.69*	**0.18**	**0.12**	*0.10*
	B	*0.23*	**0.17**	*0.16*	**0.23**	*0.25*	**NA**	**0.27**	**0.16**	*0.19*
LT 43	8.2	**0.07**	*0.02*	**0.11**	*0.07*	**0.11**	**NA**	*0.09*	*0.07*	**0.13**
PM Tide	16.4	**0.15**	*0.11*	**0.12**	*0.21*	**0.14**	**0.14**	*0.13*	*0.10*	**0.10**
	24.6	**0.10**	*0.11*	**0.16**	*0.20*	**0.21**	**0.18**	*0.20*	*0.13*	**0.14**
	B	**0.27**	*0.06*	**0.10**	*0.18*	**0.18**	**0.29**	*0.27*	*0.21*	**0.23**
LT 48	8.2	*0.19*	**0.13**	*0.18*	**0.38**	*0.14*	*0.14*	**0.14**	**0.16**	*0.09*
AM Tide	16.4	*0.16*	**0.19**	*0.25*	**NA**	*0.18*	*0.25*	**0.18**	**0.19**	*0.18*
	24.6	*0.21*	**0.30**	*0.27*	**0.58**	*0.22*	*0.12*	**0.23**	**0.19**	*0.22*
	B	*0.27*	**0.38**	*NA*	**NA**	*0.23*	*0.66*	**0.28**	**0.25**	*NA*
LT 48	8.2	**0.16**	*0.09*	**NA**	*0.16*	**0.13**	**0.14**	*0.17*	*0.28*	**0.13**
PM Tide	16.4	**0.16**	*0.11*	**0.17**	*0.14*	**0.15**	**0.29**	*0.18*	*0.28*	**0.25**
	24.6	**0.20**	*0.17*	**0.19**	*0.23*	**0.25**	**0.28**	*0.22*	*0.42*	**0.26**
	B	**0.27**	*0.13*	**0.32**	*0.72*	**0.30**	**0.46**	*0.28*	*0.45*	**0.38**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Table C-4: Settling velocities of chlorophyll *a* and pheophytin *a* (m/hr) in the DWSC.

Location	Depth	Date								
	(ft)	6/14/01	6/21/01	7/13/01	7/20/01[1]	8/25/01[1]	9/11/01	9/18/01	10/16/01	10/25/01
		(Neap)	(Spring)	(Neap)	(Spring)	(Neap)	(Neap + 1d)	(Spring + 1d)	(Spring)	(Neap + 1 d)
LT 38	8.2	*0.26*	**0.19**	*0.22*	**0.31**	*0.19*	*NA*[2]	**0.25**	**0.13**	*0.20*
AM Tide	16.4	*0.37*	**0.25**	*0.31*	**0.33**	*0.23*	*NA*	**0.34**	**0.19**	*0.26*
	24.6	*0.44*	**0.32**	*0.47*	**0.65**	*0.36*	*NA*	**0.44**	**0.26**	*0.41*
	B	*0.60*	**0.38**	*0.52*	**NA**	*0.52*	*NA*	**0.65**	**0.59**	*NA*
LT 38	8.2	**0.10**	*0.10*	**0.11**	*0.14*	**0.14**	**NA**	*0.10*	*0.15*	**0.14**
PM Tide	16.4	**0.20**	*0.19*	**0.18**	*0.23*	**0.19**	**NA**	*0.11*	*0.21*	**0.21**
	24.6	**0.24**	*0.15*	**0.28**	*0.18*	**0.32**	**NA**	*0.19*	*0.29*	**0.32**
	B	**0.24**	*0.25*	**0.36**	*0.25*	**0.37**	**NA**	*0.61*	*0.55*	**0.60**
LT 43	8.2	*0.20*	**0.15**	*0.21*	**0.11**	*0.16*	*0.28*	**0.18**	**0.10**	*0.10*
AM Tide	16.4	*0.22*	**0.19**	*0.31*	**0.18**	*0.22*	*0.41*	**0.27**	**0.12**	*0.16*
	24.6	*0.32*	**0.25**	*0.42*	**0.23**	*0.28*	*1.04*	**0.34**	**0.20**	*0.24*
	B	*0.33*	**0.27**	*0.48*	**0.62**	*0.65*	**NA**	**0.76**	**0.38**	*0.36*
LT 43	8.2	**0.10**	*0.04*	**0.15**	*0.09*	**0.14**	**NA**	*0.14*	*0.11*	**0.14**
PM Tide	16.4	**0.19**	*0.09*	**0.18**	*0.29*	**0.22**	**0.20**	*0.20*	*0.16*	**0.15**
	24.6	**0.22**	*0.11*	**0.30**	*0.22*	**0.40**	**0.27**	*0.32*	*0.21*	**0.28**
	B	**0.49**	*0.07*	**0.33**	*0.23*	**0.39**	**0.64**	*0.64*	*0.43*	**0.54**
LT 48	8.2	*0.18*	**0.33**	*0.24*	**0.66**	*0.24*	*0.28*	**0.34**	**0.39**	*0.24*
AM Tide	16.4	*0.33*	**0.53**	*0.30*	**NA**	*0.28*	*0.48*	**0.39**	**0.55**	*0.41*
	24.6	*0.59*	**0.83**	*0.47*	**0.89**	*0.52*	*0.46*	**0.48**	**0.51**	*0.53*
	B	*0.67*	**0.81**	*NA*	**NA**	*0.57*	*1.12*	**0.76**	**0.63**	*NA*
LT 48	8.2	**0.20**	*0.12*	**NA**	*0.20*	**0.18**	**0.16**	*0.22*	*0.28*	**0.20**
PM Tide	16.4	**0.22**	*0.17*	**0.29**	*0.22*	**0.23**	**0.26**	*0.27*	*0.30*	**0.40**
	24.6	**0.36**	*0.26*	**0.33**	*0.33*	**0.40**	**0.44**	*0.38*	*0.45*	**0.45**
	B	**0.57**	*0.18*	**0.65**	*1.17*	**0.53**	**0.67**	*0.71*	*0.46*	**0.68**

Italic values denote flood tide sampling. Bold face values denote ebb tide sampling.

na: data not available.

[1]Lt Trap 38 was placed at Lt. 45.

[2]The Lt. 38 sediment trap was destroyed by a ship 30 minutes after morning deployment.

[3]Location at the USGS stream velocity gage station above Stockton wastewater outfall.

Appendix D: Long-Term Oxygen Demand Experimental Data

Table D-1: BOD fitting parameters and oxygen demands for water samples collected in the DWSC and San Joaquin River at the USGS UVM Station.

Sample	Date	R^2	K	L_o	BOD_5	BOD_{10}	BOD_{20}
			d^{-1}	mg/L	mg/L	mg/L	mg/L
SJ River - Ebb	06/14/01	0.955	0.112	14.1	6.0	9.5	12.6
SJ River - Flood	06/14/01	0.977	0.108	12.9	5.4	8.5	11.4
BOD LT 48 - 5 - Ebb	06/14/01	0.977	0.144	9.9	5.1	7.6	9.3
sBOD LT 48 - 5 - Ebb	06/14/01	0.995	0.045	6.5	1.3	2.3	3.8
sCBOD LT 48 - 5 - Ebb	06/14/01	0.906	0.155	1.3	0.7	1.0	1.2
BOD LT 43 - 5 - Ebb	06/14/01	0.953	0.098	9.0	3.5	5.6	7.7
sCBOD LT 43 - 5 - Ebb	06/14/01	0.940	0.052	3.6	0.8	1.4	2.3
BOD LT 38 - 5 - Ebb	06/14/01	0.980	0.123	10.7	4.9	7.5	9.7
sCBOD LT 38 - 5 - Ebb	06/14/01	0.932	0.091	1.6	0.6	1.0	1.3
BOD SJ River - Ebb	06/21/01	0.995	0.103	11.6	4.7	7.4	10.1
sBOD SJ River - Ebb	06/21/01	0.988	0.059	10.4	2.7	4.6	7.2
sCBOD SJ River - Ebb	06/21/01	0.694	0.075	6.4	2.0	3.4	5.0
BOD SJ River - Flood	06/21/01	0.975	0.099	12.4	4.8	7.8	10.7
sBOD SJ River - Flood	06/21/01	0.803	0.086	12.5	4.4	7.2	10.3
sCBOD SJ River - Flood	06/21/01	0.907	0.063	9.9	2.7	4.6	7.1
BOD LT 48 - 5 - Ebb	06/21/01	0.999	0.072	7.8	2.4	4.0	6.0
sBOD LT 48 - 5 - Ebb	06/21/01	0.373	0.027	13.1	1.6	3.1	5.4
sCBOD LT 48 - 5 - Ebb	06/21/01	0.879	0.074	4.3	1.3	2.2	3.3
BOD LT 38 - 5 - Ebb	06/21/01	0.949	0.112	7.0	3.0	4.7	6.3
sBOD LT 38 - 5 - Ebb	06/21/01	0.960	0.045	13.0	2.6	4.7	7.8
sCBOD LT 38 - 5 - Ebb	06/21/01	0.983	0.077	4.4	1.4	2.4	3.4
BOD LT 48 - 2.5 - Ebb	06/21/01	0.969	0.086	12.2	4.3	7.1	10.1
BOD LT 48 - 7.5 - Ebb	06/21/01	0.953	0.099	11.9	4.6	7.4	10.2
BOD SJ River - Flood	07/13/00	0.465	0.057	18.0	4.5	7.9	12.3
CBOD SJ River - Flood	07/13/00	0.995	0.067	8.2	2.3	4.0	6.0
sBOD SJ River - Flood	07/13/00	0.788	0.063	7.6	2.0	3.5	5.4
sCBOD SJ River - Flood	07/13/00	0.964	0.104	3.1	1.2	2.0	2.7
BOD SJ River - Ebb	07/13/00	0.984	0.071	16.8	5.0	8.6	12.8
CBOD SJ River - Ebb	07/13/00	0.990	0.072	10.4	3.2	5.3	7.9
sBOD SJ River - Ebb	07/13/00	0.955	0.084	13.5	4.6	7.7	11.0
sCBOD SJ River - Ebb	07/13/00	0.913	0.055	13.0	3.1	5.5	8.6
BOD LT 48 - 5.0 - Ebb	07/13/00	0.989	0.083	13.0	4.4	7.3	10.6
CBOD LT 48 - 5.0 - Ebb	07/13/00	0.983	0.104	8.2	3.3	5.3	7.2
sBOD LT 48 - 5.0 - Ebb	07/13/00	0.747	0.041	9.0	1.7	3.0	5.0
sCBOD LT 48 - 5.0 - Ebb	07/13/00	0.612	0.040	5.1	0.9	1.7	2.8
BOD LT 48 -B - Ebb	07/13/00	0.980	0.072	16.9	5.1	8.7	12.9
CBOD LT 48 - B - Ebb	07/13/00	0.987	0.113	7.8	3.4	5.3	7.0
sBOD LT 48 - B - Ebb	07/13/00	0.898	0.088	11.9	4.2	6.9	9.8
sCBOD LT 48 - B - Ebb	07/13/00	0.970	0.087	9.3	3.3	5.4	7.6
BOD LT 43 - 5.0 - Ebb	07/13/00	0.964	0.117	10.2	4.5	7.1	9.3
CBOD LT 43 - 5.0 - Ebb	07/13/00	0.967	0.124	5.9	2.7	4.2	5.4
sBOD LT 43 - 5.0 - Ebb	07/13/00	0.923	0.061	6.4	1.7	2.9	4.5
sCBOD LT 43 - 5.0 - Ebb	07/13/00	0.875	0.112	4.6	2.0	3.1	4.1

Sample	Date	R^2	K	L_o	BOD_5	BOD_{10}	BOD_{20}
BOD LT 43 - B - Ebb	07/13/00	0.770	0.105	9.6	3.9	6.3	8.4
CBOD LT 43 - B - Ebb	07/13/00	0.983	0.109	5.3	2.2	3.5	4.7
sBOD LT 43 - B - Ebb	07/13/00	0.777	0.075	5.3	1.7	2.8	4.1
sCBOD LT 43 - B - Ebb	07/13/00	0.849	0.069	2.4	0.7	1.2	1.8
BOD SJ River - Flood	07/20/01	0.945	0.089	10.8	3.9	6.4	9.0
CBOD SJ River - Flood	07/20/01	0.978	0.103	6.5	2.6	4.2	5.7
BOD SJ River - Ebb	07/20/01	0.919	0.094	10.8	4.1	6.6	9.2
CBOD SJ River - Ebb	07/20/01	0.964	0.100	5.5	2.2	3.5	4.8
sBOD SJ River - Ebb	07/20/01	0.941	0.049	11.2	2.4	4.4	7.0
sCBOD SJ River - Ebb	07/20/01	0.959	0.096	4.3	1.6	2.6	3.7
BOD LT 43 - 5.0 - Ebb	07/20/01	0.954	0.096	11.3	4.3	6.9	9.6
CBOD LT 43 - 5.0 - Ebb	07/20/01	0.970	0.103	5.4	2.2	3.5	4.7
sBOD LT 43 - 5.0 - Ebb	07/20/01	0.941	0.067	7.8	2.2	3.8	5.8
sCBOD LT 43 - 5.0 - Ebb	07/20/01	0.987	0.118	3.1	1.4	2.1	2.8
BOD LT 43 - 5.0 - flood	07/20/01	0.927	0.045	11.5	2.3	4.2	6.8
CBOD LT 43 - 5.0 - flood	07/20/01	0.986	0.088	4.0	1.4	2.3	3.3
sBOD LT 43 - 5.0 - flood	07/20/01	0.695	0.028	12.6	1.7	3.1	5.4
sCBOD LT 43 - 5.0 - flood	07/20/01	0.966	0.089	3.2	1.2	1.9	2.7
BOD LT 45-5.0-Flood	07/20/01	0.886	0.057	10.0	2.5	4.4	6.8
BOD Lt. 45-B-Flood	07/20/01	0.984	0.083	10.4	3.5	5.9	8.4
BOD SJ River - Flood	08/25/01	0.936	0.057	19.4	4.8	8.5	13.3
CBOD SJ River - Flood	08/25/01	0.990	0.134	6.8	3.3	5.0	6.3
sBOD SJ River - Flood	08/25/01	0.926	0.102	10.3	4.1	6.6	8.9
sCBOD SJ River - Flood	08/25/01	0.999	0.135	6.8	3.3	5.0	6.3
BOD SJ River - Ebb	08/25/01	0.966	0.090	13.9	5.0	8.3	11.6
CBOD SJ River - Ebb	08/25/01	0.999	0.127	7.8	3.7	5.6	7.2
sBOD SJ River - Ebb	08/25/01	0.953	0.113	10.2	4.4	6.9	9.1
sCBOD SJ River - Ebb	08/25/01	0.969	0.114	6.8	2.9	4.6	6.1
BOD LT 43 - 5.0 - Flood	08/25/01	0.976	0.167	10.6	6.0	8.6	10.2
CBOD LT 43 - 5.0 - Flood	08/25/01	0.997	0.138	6.3	3.1	4.7	5.9
sBOD LT 43 - 5.0 - Flood	08/25/01	0.999	0.132	8.6	4.2	6.3	8.0
sCBOD LT 43 - 5.0 - Flood	08/25/01	1.000	0.168	3.5	2.0	2.8	3.4
BOD LT 43 - 5.0 - Ebb	08/25/01	0.990	0.156	11.0	5.9	8.7	10.5
CBOD LT 43 - 5.0 - Ebb	08/25/01	0.998	0.166	6.1	3.4	4.9	5.9
sBOD LT 43 - 5.0 - Ebb	08/25/01	0.950	0.110	11.3	4.8	7.5	10.0
sCBOD LT 43 - 5.0 - Ebb	08/25/01	0.988	0.087	7.9	2.8	4.6	6.5
BOD LT 43 - B - Flood	08/25/01	0.996	0.142	12.1	6.2	9.2	11.4
BOD LT 43 - B - Ebb	08/25/01	0.998	0.156	11.3	6.1	8.9	10.8
BOD LT 48 - B - Flood	08/25/01	0.996	0.142	12.1	6.2	9.2	11.4
BOD LT 48 - B - Ebb	08/25/01	0.989	0.111	11.3	4.8	7.6	10.1
BOD SJ River - Flood	09/11/01	0.997	0.092	8.7	3.2	5.3	7.4
CBOD SJ River - Flood	09/11/01	0.987	0.108	5.7	2.4	3.8	5.0
sBOD SJ River - Flood	09/11/01	0.963	0.049	5.6	1.2	2.2	3.5
sCBOD SJ River - Flood	09/11/01	0.993	0.119	2.2	1.0	1.5	2.0
BOD SJ River - Ebb	09/11/01	0.996	0.053	11.3	2.6	4.7	7.4
CBOD SJ River - Ebb	09/11/01	0.991	0.106	5.0	2.1	3.3	4.4
sBOD SJ River - Ebb	09/11/01	0.526	0.014	15.2	1.0	2.0	3.7
sCBOD SJ River - Ebb	09/11/01	0.986	0.119	2.3	1.0	1.6	2.1

Sample	Date	R^2	K	L_o	BOD_5	BOD_{10}	BOD_{20}
BOD LT 48 - 5.0 - Ebb	09/11/01	0.997	0.064	11.9	3.3	5.6	8.6
CBOD LT 48 - 5.0 - Ebb	09/11/01	0.996	0.094	4.0	1.5	2.5	3.4
sBOD LT 48 - 5.0 - Ebb	09/11/01	0.990	0.045	7.1	1.4	2.6	4.2
sCBOD LT 48 - 5.0 - Ebb	09/11/01	0.978	0.077	1.7	0.6	0.9	1.4
BOD LT 43 - 5.0 - Flood	09/11/01	0.998	0.095	7.4	2.8	4.5	6.3
CBOD LT 43 - 5.0 - Flood	09/11/01	0.997	0.099	3.5	1.4	2.2	3.0
sBOD LT 43 - 5.0 - Flood	09/11/01	0.924	0.047	7.4	1.6	2.8	4.6
sCBOD LT 43 - 5.0 - Flood	09/11/01	0.903	0.065	1.9	0.5	0.9	1.4
BOD SJ River - Ebb	09/18/01	0.963	0.075	14.1	4.4	7.5	11.0
CBOD SJ River - Ebb	09/18/01	0.968	0.116	6.3	2.8	4.4	5.7
sBOD SJ River - Ebb	09/18/01	0.917	0.027	15.4	2.0	3.7	6.5
sCBOD SJ River - Ebb	09/18/01	0.999	0.062	5.0	1.3	2.3	3.6
BOD SJ River - Flood	09/18/01	0.989	0.085	13.9	4.8	8.0	11.4
CBOD SJ River - Flood	09/18/01	0.964	0.116	7.9	3.5	5.4	7.1
sBOD SJ River - Flood	09/18/01	0.932	0.027	7.9	1.0	1.9	3.3
sCBOD SJ River - Flood	09/18/01	0.872	0.071	2.3	0.7	1.1	1.7
BOD LT 43 - 5.0 - Ebb	09/18/01	0.994	0.085	10.2	3.5	5.8	8.3
CBOD LT 43 - 5.0 - Ebb	09/18/01	0.935	0.107	3.5	1.5	2.3	3.1
sBOD LT 43 - 5.0 - Ebb	09/18/01	0.998	0.082	6.4	2.1	3.6	5.1
sCBOD LT 43 - 5.0 - Ebb	09/18/01	0.882	0.090	1.4	0.5	0.8	1.1
BOD LT 43 - 5.0 - flood	09/18/01	0.973	0.064	10.3	2.8	4.9	7.5
CBOD LT 43 - 5.0 - flood	09/18/01	0.947	0.099	3.8	1.5	2.4	3.3
sBOD LT 43 - 5.0 - flood	09/18/01	0.995	0.065	6.3	1.8	3.0	4.6
sCBOD LT 43 - 5.0 - flood	09/18/01	0.718	0.078	1.0	0.3	0.6	0.8
BOD SJ River - Ebb	10/16/01	0.985	0.115	7.2	3.1	4.9	6.5
CBOD SJ River - Ebb	10/16/01	0.945	0.130	3.8	1.8	2.8	3.5
sBOD SJ River - Ebb	10/16/01	0.951	0.091	4.9	1.8	2.9	4.1
sCBOD SJ River - Ebb	10/16/01	0.978	0.075	1.8	0.6	1.0	1.4
BOD SJ River - Flood	10/16/01	0.986	0.100	9.6	3.8	6.1	8.3
CBOD SJ River - Flood	10/16/01	0.964	0.145	5.6	2.9	4.3	5.3
sBOD SJ River - Flood	10/16/01	0.972	0.029	7.2	1.0	1.8	3.2
sCBOD SJ River - Flood	10/16/01	1.000	0.080	1.7	0.6	0.9	1.4
BOD LT 43 - 5.0 - Ebb	10/16/01	0.960	0.075	12.6	3.9	6.6	9.8
CBOD LT 43 - 5.0 - Ebb	10/16/01	0.982	0.111	5.0	2.2	3.4	4.5
sBOD LT 43 - 5.0 - Ebb	10/16/01	1.000	0.085	7.1	2.5	4.1	5.8
sCBOD LT 43 - 5.0 - Ebb	10/16/01	0.981	0.090	2.8	1.0	1.7	2.4
BOD LT 43 - 5.0 - Flood	10/16/01	0.964	0.063	13.0	3.5	6.0	9.3
CBOD LT 43 - 5.0 - Flood	10/16/01	0.975	0.147	5.7	3.0	4.4	5.4
sBOD LT 43 - 5.0 - Flood	10/16/01	0.975	0.103	3.6	1.5	2.3	3.1
sCBOD LT 43 - 5.0 - Flood	10/16/01	0.988	0.109	3.2	1.4	2.1	2.9
BOD LT 48 - 5.0 - Ebb	10/16/01	0.957	0.070	16.3	4.8	8.2	12.3
BOD LT 48 - B - Ebb	10/16/01	0.913	0.041	18.1	3.4	6.1	10.2
BOD LT 48 - 5.0 - Flood	10/16/01	0.981	0.081	13.7	4.6	7.6	11.0
BOD LT 48 - B - Flood	10/16/01	0.959	0.048	17.3	3.7	6.6	10.7
BOD SJ River - Flood	10/25/01	0.964	0.071	5.8	1.7	3.0	4.4
CBOD SJ River - Flood	10/25/01	0.958	0.110	3.9	1.6	2.6	3.4
sBOD SJ River - Flood	10/25/01	0.830	0.046	1.9	0.4	0.7	1.1

Sample	Date	R^2	K	L_o	BOD_5	BOD_{10}	BOD_{20}
sCBOD SJ River - Flood	10/25/01	0.707	0.033	1.9	0.3	0.5	0.9
BOD SJ River - Ebb	10/25/01	0.955	0.096	4.6	1.7	2.8	3.9
CBOD SJ River - Ebb	10/25/01	0.955	0.105	3.4	1.4	2.2	3.0
sBOD SJ River - Ebb	10/25/01	0.928	0.057	2.3	0.6	1.0	1.6
sCBOD SJ River - Ebb	10/25/01	0.934	0.046	2.2	0.5	0.8	1.3
BOD LT 48 - 5.0 - Ebb	10/25/01	0.968	0.072	7.4	2.3	3.8	5.7
CBOD LT 48 - 5.0 - Ebb	10/25/01	0.963	0.126	3.7	1.7	2.6	3.4
sBOD LT 48 - 5.0 - Ebb	10/25/01	0.027	0.017	10.3	0.8	1.6	2.9
sCBOD LT 48 - 5.0 - Ebb	10/25/01	0.979	0.081	2.2	0.7	1.2	1.8
BOD LT 43 - 5.0 - Ebb	10/25/01	0.866	0.037	9.5	1.6	2.9	5.0
CBOD LT 43 - 5.0 - Ebb	10/25/01	0.982	0.078	3.3	1.1	1.8	2.6
sBOD LT 43 - 5.0 - Ebb	10/25/01	0.927	0.059	4.6	1.2	2.0	3.2
sCBOD LT 43 - 5.0 - Ebb	10/25/01	0.952	0.050	1.7	0.4	0.7	1.1
BOD LT 38 - 5.0 - Flood	10/25/01	0.995	0.110	7.3	3.1	4.9	6.5
BOD LT 38 - 7.5 - Flood	10/25/01	0.971	0.095	8.1	3.1	5.0	6.9
BOD LT 43 - 5.0 - Flood	10/25/01	0.994	0.103	6.5	2.6	4.2	5.7
BOD LT 43 - B - Flood	10/25/01	0.984	0.112	8.9	3.8	6.0	8.0

Table D-2. : BOD fitting parameters and oxygen demands for sediments trapped in the DWSC.

		Fitting Statistics			mg BOD_{ult}/ mg sediment parameter				mg BOD_{10}/ mg sediment parameter			
Sample	Date	R^2	K	L_o	TSS	VSS	Chl a	Chl a+ Pha	TSS	VSS	Chl a	Chl a+ Pha
LT 48 - 5 - Ebb	06/14/01	0.977	0.120	8.21	0.022	0.229	0.135	0.045	0.015	0.160	0.094	0.031
LT 43 - 5 - Ebb	06/14/01	0.983	0.147	5.96	0.047	0.368	0.387	0.072	0.036	0.284	0.298	0.056
LT 48 - B - Ebb	06/14/01	0.929	0.081	33.79	0.017	0.210	0.245	0.054	0.009	0.116	0.135	0.030
LT 48 - B - Ebb	06/14/01	0.975	0.096	30.53	0.015	0.190	0.221	0.049	0.009	0.117	0.137	0.030
LT 43 - B - Ebb	06/14/01	0.969	0.116	10.4	0.021	0.197	0.438	0.051	0.014	0.135	0.301	0.035
LT 38 - B - Ebb	06/14/01	0.958	0.119	10.32	0.033	0.328	1.623	0.131	0.023	0.228	1.127	0.091
BOD LT 48 - 2.5 - Ebb	06/21/01	0.960	0.109	11.328	0.025	0.224	0.257	0.042	0.016	0.149	0.171	0.028
BOD LT 48 - 5.0 - Ebb	06/21/01	0.924	0.094	29.851	0.033	0.316	0.481	0.066	0.020	0.192	0.293	0.040
BOD LT 48 - 7.5 - Ebb	06/21/01	0.938	0.122	34.170	0.028	0.258	0.430	0.055	0.020	0.182	0.304	0.039
BOD LT 48 - B - Ebb	06/21/01	0.936	0.105	25.458	0.016	0.159	0.318	0.037	0.010	0.103	0.206	0.024
BOD LT 38 - 5.0 - Ebb	06/21/01	0.973	0.153	6.361	0.038	0.257	0.413	0.080	0.030	0.201	0.324	0.063
BOD LT 38 - B - Ebb	06/21/01	0.951	0.150	7.733	0.021	0.164	0.534	0.058	0.016	0.127	0.415	0.045
BOD LT 43 - 5.0 - Ebb	07/13/01	0.941	0.154	6.003	0.048	0.303	0.087	0.034	0.037	0.238	0.068	0.027
BOD LT 43 - B - Ebb	07/13/01	0.933	0.094	36.941	0.125	0.815	0.801	0.133	0.076	0.497	0.488	0.081
BOD LT 48 - 5.0 - Ebb	07/13/01	0.970	0.094	6.398	0.042	0.316	0.083	0.035	0.026	0.192	0.050	0.021
BOD LT 48 - B - Ebb	07/13/01	0.912	0.094	31.920	0.021	0.194	0.115	0.038	0.013	0.118	0.070	0.023
BOD LT 45 - 5.0 - Flood	07/20/01	0.944	0.133	7.504	0.086	0.602	0.608	0.112	0.063	0.443	0.448	0.082
BOD LT 45 - B - Flood	07/20/01	0.959	0.098	4.113	0.022	0.206	0.205	0.043	0.014	0.129	0.129	0.027
BOD LT 43 - 5.0 - Flood	07/20/01	0.944	0.142	9.320	0.107	0.836	0.560	0.112	0.081	0.634	0.425	0.085
BOD LT 43 - B - Flood	07/20/01	0.822	0.096	4.194	0.020	0.198	0.349	0.048	0.013	0.122	0.215	0.029
BOD LT 43 - 5.0 - Ebb	07/20/01	0.991	0.086	8.123	0.055	0.412	0.456	0.077	0.032	0.238	0.264	0.044
BOD LT 43 - B - Ebb	07/20/01	0.941	0.072	43.770	0.032	0.307	1.389	0.123	0.017	0.158	0.715	0.064
BOD LT 43 - 5.0 - Flood	08/25/01	0.842	0.088	4.399	0.045	0.317	0.207	0.063	0.026	0.185	0.121	0.037
BOD LT 43 - B - Flood	08/25/01	0.999	0.125	11.567	0.027	0.238	0.307	0.056	0.019	0.170	0.219	0.040
BOD LT 43 - 5.0 - Ebb	08/25/01	0.965	0.237	3.686	0.045	0.346	0.148	0.048	0.041	0.313	0.134	0.043
BOD LT 43 - B - Ebb	08/25/01	0.970	0.103	17.361	0.045	0.361	0.423	0.088	0.029	0.232	0.272	0.056

BOD LT 48 - 5.0 - Flood	08/25/01	0.996	0.199	5.479	0.020	0.179	0.106	0.039	0.018	0.154	0.091	0.034
BOD LT 48 - B - Flood	08/25/01	0.978	0.161	18.400	0.019	0.180	0.218	0.054	0.015	0.144	0.175	0.043
BOD LT 48 - 5.0 - Ebb	08/25/01	0.983	0.225	6.543	0.039	0.314	0.109	0.047	0.035	0.281	0.098	0.042
BOD LT 48 - B - Ebb	08/25/01	0.999	0.143	15.129	0.024	0.301	0.152	0.050	0.018	0.229	0.116	0.038
BOD LT 48 - 5.0 - Ebb (not stirred)	08/25/01	0.991	0.108	6.359	0.038	0.305	0.106	0.046	0.025	0.202	0.070	0.030
BOD LT 48 - B - Ebb (not stirred)	08/25/01	0.989	0.105	13.532	0.021	0.269	0.136	0.045	0.014	0.175	0.088	0.029
BOD LT 43 - 5.0 - Flood	09/11/01	0.880	0.070	8.434	0.023	0.218	0.284	0.054	0.011	0.110	0.143	0.027
BOD LT 43 - 7.5 - Flood	09/11/01	0.982	0.084	16.183	0.023	0.234	0.156	0.040	0.013	0.133	0.089	0.023
BOD LT 43 - 5.0 - Ebb	09/11/01	0.846	0.129	4.840	0.076	0.802	0.365	0.098	0.055	0.582	0.264	0.071
BOD LT 43 - B - Ebb	09/11/01	0.998	0.057	10.312	0.020	0.199	0.310	0.045	0.008	0.086	0.134	0.020
BOD LT 48 - 5.0 - Flood	09/11/01	0.971	0.113	8.768	0.012	0.131	0.123	0.030	0.008	0.088	0.083	0.020
BOD LT 48 - B - Flood	09/11/01	0.961	0.105	31.997	0.012	0.137	0.172	0.039	0.008	0.089	0.112	0.025
BOD LT 48 - 5.0 - Ebb	09/11/01	Sediment trap concentration too low										
BOD LT 48 - B -Ebb	09/11/01	0.930	0.065	9.069	0.014	0.144	0.114	0.029	0.006	0.068	0.054	0.014
BOD LT 43 - 5.0 - Ebb	09/18/01	0.997	0.084	7.655	0.041	0.334	0.267	0.065	0.023	0.190	0.151	0.037
BOD LT 43 - 5.0 - flood	09/18/01	Sediment trap concentration too low										
BOD LT 43 - B - Ebb	09/18/01	0.960	0.129	28.822	0.029	0.269	0.590	0.062	0.021	0.195	0.427	0.045
BOD LT 43 - B - Flood	09/18/01	0.945	0.141	9.240	0.022	0.213	0.300	0.041	0.017	0.161	0.227	0.031
BOD LT 48 - 5.0 - Ebb	09/18/01	0.927	0.134	13.508	0.030	0.276	0.173	0.048	0.022	0.204	0.128	0.036
BOD LT 48 - B - Ebb	09/18/01	0.963	0.127	32.054	0.025	0.242	0.270	0.048	0.018	0.174	0.194	0.035
BOD LT 48 - 5.0 - Flood	09/18/01	0.982	0.147	10.628	0.068	0.607	0.660	0.176	0.052	0.467	0.508	0.136
BOD LT 48 - B - Flood	09/18/01	0.980	0.136	20.680	0.028	0.284	0.671	0.092	0.021	0.211	0.499	0.068
BOD LT 43 - 5.0 - Ebb	10/16/01	0.957	0.084	2.861	0.040	0.282	0.089	0.045	0.023	0.159	0.050	0.025
BOD LT 43 - B - Ebb	10/16/01	0.984	0.096	10.312	0.016	0.173	0.221	0.043	0.010	0.107	0.136	0.026
BOD LT 43 - 5.0 - Flood	10/16/01	0.958	0.160	2.100	0.029	0.176	0.067	0.030	0.023	0.140	0.054	0.024
BOD LT 43 - B - Flood	10/16/01	0.932	0.115	9.555	0.025	0.225	0.200	0.050	0.017	0.154	0.137	0.034
BOD LT 48 - 5.0 - Ebb	10/16/01	Delayed uptake then unlimited uptake for 30 d										
BOD LT 48 - B - Ebb	10/16/01	Delayed uptake then unlimited uptake for 30 d										
BOD LT 48 - 5.0 - Flood	10/16/01	0.995	0.243	3.013	0.057	0.402	0.067	0.049	0.052	0.366	0.061	0.044
BOD LT 48 - B - Flood	10/16/01	0.976	0.171	6.257	0.042	0.359	0.100	0.057	0.034	0.294	0.082	0.047

BOD LT 43 - 5.0 - Flood	10/25/01	0.977	0.092	2.0	0.023	0.164	0.105	0.039	0.014	0.099	0.063	0.023
BOD LT 43 - B - Flood	10/25/01	0.987	0.119	9.2	0.018	0.178	0.264	0.061	0.013	0.123	0.183	0.042
BOD LT 43 - 5.0 - Ebb	10/25/01	0.922	0.180	2.4	0.018	0.215	0.158	0.055	0.015	0.180	0.132	0.046
BOD LT 43 - B - Ebb	10/25/01	0.958	0.147	8.3	0.013	0.136	0.204	0.041	0.010	0.105	0.158	0.032
BOD LT 38 - 5.0 - Flood	10/25/01	0.952	0.115	7.0	0.029	0.245	0.303	0.070	0.020	0.167	0.207	0.048
BOD LT 38 - 7.5 - Flood	10/25/01	0.987	0.122	6.0	0.013	0.128	0.196	0.040	0.009	0.090	0.138	0.028
BOD LT 48 - 5.0 - Ebb	10/25/01	0.978	0.157	7.4	0.024	0.254	0.154	0.063	0.019	0.202	0.122	0.050
BOD LT 48 - B - Ebb	10/25/01	0.958	0.133	8.8	0.017	0.185	0.112	0.039	0.013	0.136	0.082	0.029