KEEYASK GENERATION PROJECT

STAGE IV STUDIES - PHYSICAL ENVIRONMENT

ESTIMATION OF POTENTIAL ORGANIC TOTAL SUSPENDED SOLIDS – FUTURE WITH PROJECT

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KEEYASK
GENERATION PROJECT

STUDY TEAM:

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ACKNOWLEDGEMENTS:

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1 INTRODUCTION

1.1 BACKGROUND

This Design Memorandum investigates the potential increase in Organic Total Suspended Solids (Org-TSS) concentrations that may result due to peatland disintegration and erosion in the Keeyask forebay. Potential impacts of the Keeyask Project on the erosion and sedimentation of mineral soils has been studied, which included consideration of potential effects on total suspended solids (see Design Memo GN 9.2.8). Peatland disintegrationhas also been studied and reported separately (see Design Memo GN 9.2.7). However, neither of these two studies specifically considered the potential for the Keeyask Project to affect Org-TSS in the post-project environment.

1.2 STUDY AREA

The study area for the Org-TSS analysis focuses on the upstream study area encompassing the forebay that will be impounded upstream of the proposed Keeyask Generating Station because this is the area in which Org-TSS originates (Figure 1-1). The analysis also considers the potential for transporting Org-TSS to Stephens Lake downstream of Keeyask.

1.3 EXISTING ENVIRONMENT CONDITIONS

In the existing environment, organics in the water column are typically present in a dissolved form, not as suspended solids. Water quality test results obtained for baseline aquatic studies (Aquatics Supporting Volume) show that the concentration of dissolved organic carbon is typically less than 1 mg/L and may regularly be near 0 mg/L. Given that organic carbon likely comprises about 50% of the mass of dissolved organic solids, the amount of organic suspended sediment concentration in the existing environment might typically range from 0 mg/L to 2 mg/L. Results of lab tests on water samples obtained during baseline monitoring of sedimentation processes had measured concentrations of volatile suspended solids, which provides an approximate measure of organic suspended sediment concentrations, of less than 2 mg/L (i.e., below the laboratory detection limit) at 70% of the sites tested while the remaining 30% had an average reported concentration of 2 mg/L.

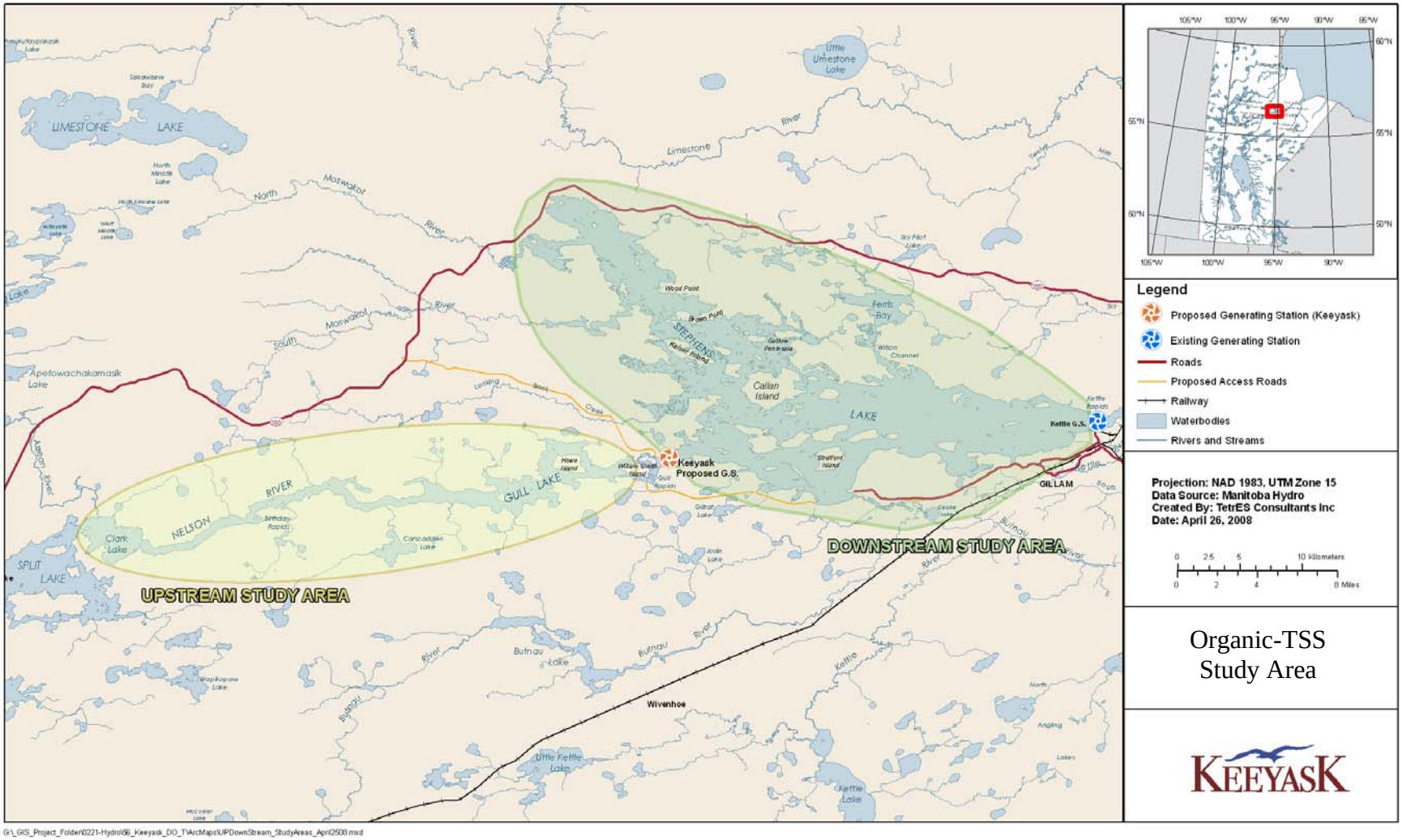

Figure 1-1: Study Area

2 STUDY APPROACH

The issue of Org-TSS was not analyzed using a detailed computational fluid-dynamics computer model as was done for some other Keeyask Physical Environment studies. Instead, the analysis uses a "spreadsheet model" to estimate the potential range of Org-TSS concentrations that might occur based on estimates of how much peat may enter the water column each hour, peat settling properties and estimation of mixing effects. Estimates and assumptions made in the analysis were developed based on group discussion of the method for calculating Org-TSS involving TetrES Consultants Inc. (now Stantec Consulting Ltd.), North/South Consultants Inc., ECOSTEM, KGS Acres and Manitoba Hydro.

2.1 ESTIMATION OF ORG-TSS ADDED TO FOREBAY EACH HOUR

The peatland disintegration study (GN 9.2-7) estimated the total mass of peat accruing to the forebay in Year 1 (i.e., in first year after impoundment) and Years 2-5 (i.e., total over these four years). The study classified the peat entering the forebay as either suspended, floating or sinking fractions. For this study it was assumed that the suspended portion of the mass identified in the peatland disintegration study (GN 9.2-7) would cause Org-TSS in the water column (i.e., assumes the suspended fraction of the mass is what gets dispersed throughout the transport zones). Starting with the total mass of suspended peat in Year 1 and Years 2-5, the potential peat load entering the forebay each hour during the open water season was estimated for each year for years 1 through 5.

The peatland disintegration study explicitly provides the annual suspended breakdown and resurfaced peat masses for Year 1. However, since the Year 2-5 mass represents the total over this 4-year period, this mass must be broken down into an annual load in years 2, 3, 4 and 5 after initial impoundment. The peat loading will not be evenly distributed over these years: 25% of the Year 2-5 load would enter each year if it were. ECOSTEM advised that the loading would likely be highest in Year 2 and lower each subsequent year (pers. comm., J. Ehnes, June 2009). To account for this uneven distribution of loading it was assumed that the fraction of the total Year 2-5 loading that occurs in each individual year is:

- Year 2 – 50% of Year 2-5 peat mass
- Year 3 – 25%
- Year 4 – 15%
- Year 5 – 10%

The hourly load (i.e. mass) of suspended resurfaced peat that may contribute to Org-TSS was calculated on the simple assumption that the loading is evenly distributed in each hour during a 26-week open water period. The fraction of annual suspended load entering each hour was calculated as follows:

- 3.85% enters per week in the 26-week open water period (=1/26)
- 14.3% enters per day (=1/7)
- 4.17% enters each hour (=1/24)
- fraction of annual load entering each hour = 3.85% x 14.3% x 4.17% = 0.023%

Rather than being evenly distributed, the loading that may result due to shoreline breakdown is expected to be higher during episodes causing greater breakdown (e.g., during high wind/wave events) and less during other periods (e.g., calm winds). Because peat breakdown is more episodic, the Org-TSS analysis assumed that the hourly breakdown load is approximately 2.5 times greater than the evenly distributed loading. Thus the estimated Org-TSS concentrations represent a period of higher loading, which means lower concentrations would occur at other times. For the breakdown peat the hourly suspended load contributing to Org-TSS is calculated as:

- 10% enters in a week with a high break down event (~2.5 x 1/26)
- 14.3% enters per day (=1/7)
- 4.17% enters each hour (=1/24)
- fraction of annual load entering each high load hour = 10% x 14.3% x 4.17% = 0.057%

The peatland disintegration study divided the upstream study area into a number of different peat-transport zones (Figure 2-1) and quantified the Year 1 and Year 2-5 masses of suspended breakdown and resurfaced peat that would be generated in each zone. Starting with these peat masses, the hourly load of suspended peat recruiting into each zone was calculated for years 1 through 5 (using the 50%, 25%, 15%, 10% distribution for Years 2-5) multiplied by the respective annual-to-hourly reduction factors for the suspended breakdown (i.e., 0.023%) and resurfaced (i.e., 0.057%) sources of peat.

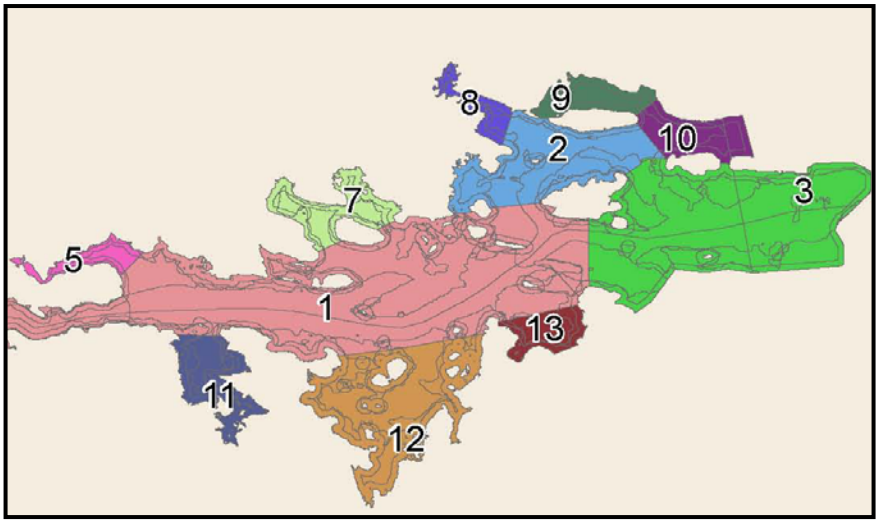

Figure 2-1: Peat Transport Zones

The hourly mass of peat potentially contributing to Org-TSS is converted to a concentration (mg/L) by diving the hourly mass in each peat-transport zone by the volume of water in the zone with the reservoir at full-supply level ([hourly suspended breakdown mass + hourly suspended resurfaced mass] / zone volume). Zone volumes were previously calculated as part of the post-project Water Temperature and Dissolved Oxygen study (Stantec, 2012). This calculation assumes that the new loads of suspended peat occur instantaneously at the start of each hour and are completely and evenly mixed throughout the volume of each respective zone. The hourly Org-TSS loading for each zone in each year is summarized in Table 2.-1 (see Appendix A for detailed calculations).

Table 2-1:
Estimated Hourly Load of New Org-TSS Entering Each Peat Transport Zone (mg/L)

Zone	Year 1	Year 2	Year 3	Year 4	Year 5
1	0.1	0.0	0.0	0.0	0.0
2	0.2	0.1	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0
5	0.3	0.1	0.0	0.0	0.0
7	1.4	0.3	0.2	0.1	0.1
8	3.4	0.5	0.3	0.2	0.1
9	1.8	0.3	0.1	0.1	0.1
10	0.5	0.3	0.2	0.1	0.1
11	2.0	0.2	0.1	0.1	0.0
12	0.9	0.5	0.2	0.1	0.1
13	0.3	0.1	0.1	0.0	0.0

2.2 SETTLING PROPERTIES OF PEAT FROM THE STUDY AREA

Org-TSS entering the water column settles out over time, with some fraction settling rapidly while other fractions settling slowly. In order to calculate Org-TSS concentrations, it is necessary to have an understanding of the settling properties of the peat material that causes Org-TSS. Ecostem Ltd. performed laboratory testing to identify the settling properties of 5 representative peat samples obtained from the study area (Ecostem, 2010). The five peat samples were given the identifiers TSS-20, TSS-21, TSS-22, TSS-23, and TSS-24. A unique test procedure was developed to quantify the peat settling properties because there were no standard test methods for this type of material.

To quantify the settling properties, each representative peat sample was divided into 5 sub-subsamples that were used to perform 5 settling rate tests. In separate barrels of water, each sub-sample was placed at the water surface and hand agitated to break it up so that the material began to settle. The barrels were then left to stand for 5 different test durations: 0.5, 1.75, 6, 18 and 42 hours. Given the depth of the water and the test duration, the minimum velocity of material that settled for that test could be calculated (i.e., depth divide by duration). At the end of the test duration for a particular sub-sample, the masses of floating, suspended and settled peat were measured. The percentage of material that settled for that particular test duration (i.e., settling rate) could then be calculated. Combining the results from the settling tests on the 5 sub-samples, a settling profile with five data points was obtained for a representative peat sample. Because settling tests could not be run until 100% of the material settled, it was assumed that the fraction remaining in suspension at the end of the longest duration test (i.e., slowest settling rate) would settle with a velocity of about one-half the slowest measured settling velocity. The percentage of mass that has settled is calculated relative to the total mass of only the settled and suspended material at the end of the test. This is conservative because it increases the estimate of the percentage that remains in suspension. The calculations of the settling rate profiles for each of the five representative samples based on the laboratory test results are summarized in Appendix B.

Because the settling rate distribution for a peat sample is determined from 5 separate settling tests rather than measuring different rates from a single test, there were a few instances in which the percent of mass settled at one settling rate was greater than the percent of mass settled at the next slower settling rate. Such a result cannot be used to calculate Org-TSS concentrations because it physically requires that the percentage of total mass settling with the next slower rate is negative. In the three instances where such results occurred, the percent of mass that has settled at the faster rate was adjusted by setting it equal to the average of the measured percent of mass settled at the next slower and next faster settling rates:

$$\%Settled_i = 0.5 * (\%Settled_{i-1} + \%Settled_{i+1})$$

where,

$\%Settled_i$ = percent of mass settled at settling rate i

$\%Settled_{i-1}$ = percent of mass settled at next faster settling rate

$\%Settled_{i+1}$ = percent of mass settled at next slower settling rate

The adjusted value is less than the measured value, which means the mass remaining in suspension at that settling rate is assumed to be greater (i.e., more conservative) than the measurements would suggest.

An example of the adjustment procedure is provided from the test results for representative peat sample TSS-21 (Figure 2-2). The percent of mass settled in the 3 m/day test was 99.5%, which was higher than the 98.6% settled in the 10.5 m/day test as expected, but is also higher than the 99.4% settled in the slower 1 m/day test. The percent of mass settled at the 3 m/day rate was adjusted to be the average of the percent settled from the 10.5 m/day and 1 m/day test (0.5 *(98.6+99.4)), giving a percent mass settled of 99% rather than 99.4% (Table 2-2).

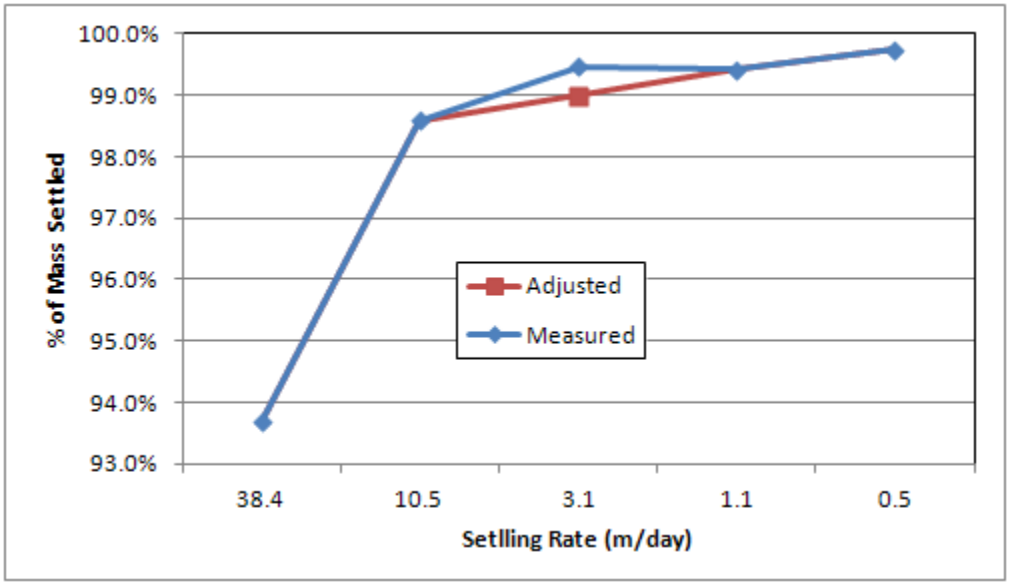

Figure 2-2: Adjusted Settling Curve for Peat Test Sample TSS-21

Test results for the 5 representative peat samples showed that more than 90% of the total peat material settled at a rate of 38.4 m/day (1.6 m/h) or faster and more than 98% of the mass, average of almost 99%, settled just over 3 m/day (Table 2-2). In areas off the main channel (i.e., peat transport zones 5-13, Figure 2-1) average water depths range from about 2-4 metres thus, given the measured settling rates, the bulk of the peat load that contributes to Org-TSS would settle out of the water within 2-3 hours and more than 99% would settle within about a day.

The percentage of the total mass at a particular settling rate is assumed to be equal to the difference between the percentage of mass settled at that rate minus the percentage settled at the next faster rate (Table 2-3). This is a conservative assumption because it assumes a slower settling rate for any material that has a settling rate between two measured values. For example, if settling rates of 10 m/day and 1 m/day were measured, then any material that actually settles at a rate of 5 m/day would be assumed to settle at a rate of only 1 m/day, which increases the time this material remains in suspension leading to potential overestimation of Org-TSS concentrations. The percentage of mass at the fastest settling rate (i.e., shortest duration test) is assumed to be equal to the percentage of mass that settled for that test duration.

Table 2-2:
Adjusted Percent of Mass Settled for Study Area Peat Samples

Test Duration	Rate	Sample				
hours	m/day	TSS-20	TSS-21	TSS-22	TSS-23	TSS-24
0.5	38.40	90.1%	93.7%	95.9%	[1]90.0%	92.9%
1.75	10.85	97.8%	98.6%	96.3%	95.8%	99.0%
6.0	3.17	98.2%	99.0%	98.5%	99.6%	99.2%
18.0	1.08	98.7%	99.4%	98.8%	99.7%	99.3%
42.0	0.46	99.2%	99.7%	99.3%	99.7%	99.4%
n/a[2]	0.20	100.0%	100.0%	100.0%	100.0%	100.0%

1- 0.5 hour test not run for sample TSS-23, percent settled assumed to be equal to lowest percentage of other four tests.
2- assumed that 0.2 metres per day is slowest settling rate.

Table 2-3:
Adjusted Percent of Mass at Measured Settling Rates for Study Area Peat Samples

Test Duration	Rate	Sample				
hours	m/day	TSS-20	TSS-21	TSS-22	TSS-23	TSS-24
0.5	38.40	90.1%	93.7%	95.9%	90.0%	92.9%
1.75	10.85	7.8%	4.9%	0.4%	5.8%	6.0%
6.0	3.17	0.4%	0.4%	2.3%	3.9%	0.2%
18.0	1.08	0.6%	0.4%	0.3%	0.05%	0.1%
42.0	0.46	0.5%	0.3%	0.4%	0.01%	0.1%
n/a[2]	0.20	0.8%	0.3%	0.7%	0.3%	0.6%

1- 0.5 hour test not run for sample TSS-23, percent settled assumed to be equal to lowest percentage of other four tests.
2- assumed that 0.2 metres per day is slowest settling rate.

2.3 CALCULATION OF ORG-TSS CARRY-OVER EFFECTS

The fraction of Org-TSS that takes longer than one hour to settle will be present when a new hourly load enters the water. When a new hourly load of Org-TSS is added to the water column, the total Org-TSS is equal to the new Org-TSS load plus the load that has carried over from previous hours. Since loading is instantaneous at the start of the hour, the peak Org-TSS concentration will occur when a new load is added while the minimum concentration occurs at the end of the hour immediately before a new loading enters. Assuming the loading is steady (i.e., same load added each hour), the hourly maximum and minimum Org-TSS concentrations will each reach a near equilibrium concentration (i.e., after a certain time the maximum and minimum concentrations are the same each hour).

In addition to settling, Org-TSS concentrations would be reduced because of mixing due to inflow from the upstream area, which has little organic content (i.e., inflow TSS results from inorganic matter), and transport of organic material downstream. However, because the Org-TSS analysis did not use hydrodynamic modeling that might account for mixing and transport effects, the Org-TSS analysis takes a more conservative approach by only accounting for the effect of settling.

Using the estimated settling-velocity distributions (Table 2-3), the near equilibrium carry-over effect without mixing could be calculated for different water depths, which results in a carry-over factor for each depth expressed as a percentage of the daily new Org-TSS load. This calculation was performed for water depths of 0-10m, in 1m increments. Results from the water temperature and dissolved oxygen modeling found that areas of 10m depth or more are well mixed due to flow through the reservoir and are assumed to have no carry-over. Without mixing the peak equilibrium Org-TSS at the beginning of

the hour (i.e., when load is added) at any specific point is simply the daily new Org-TSS load multiplied by 1 plus the carry-over factor for the depth at that point. The carry-over factor depends upon the settling properties of the peat.

Thus, for a particular point ***P*** in peat transport zone ***Z***, the peak Org-TSS at the start of the hour is:

$$Peak\ Org\text{-}TSS = M_Z^0\left(1+\left(\sum_{i=1}^{N} f_i n_i\left(1-\frac{V_i}{D_P}\frac{(n_i+1)}{2}\right)\right)\right)$$

where;

M_Z^0 = hourly new Org - TSS in peat transport zone Z in which point P is located (mg/L)

D_P = depth at point P (m)

N = number of peat settling velocities considered in distribution (= 6)

$V_i = i^{th}$ settling velocity (m/h)

f_i = fraction of mass with settling velocity V_i

$n_i = \frac{D_P}{V_i}$ = hours for complete settling of particle with velocity V_i

note that spreadsheet model uses n = int(V/D)

The daily minimum TSS, i.e. the amount to be carried over, is calculated by:

$$Minimum\ Org\text{-}TSS = M_Z^0\left(\sum_{i=1}^{N} f_i n_i\left(1-\frac{V_i}{D_P}\frac{(n_i+1)}{2}\right)\right)$$

Summary Org-TSS values are also calculated for each peat transport zone for water depths of 0-10m, in 1m increments. Based on the settling-velocity profiles the peak and minimum Org-TSS can be calculated for specified water depth ranges in each peat transport zone using the above equations and substituting the greater depth in the depth range for Dp (e.g., for depths of 5-6 m, us Dp=6). Using the upper depth value in each depth range maximizes the potential peat mass within that depth range that may be available for carry-over because it is the longest depth to settle through.

2.4 PROCEDURE TO ESTIMATE POTENTIAL ORG-TSS TRANSPORT DOWNSTREAM TO STEPHENS LAKE

As noted previously, Org-TSS transport was not modeled using computer-modeling techniques employed in other physical environment studies. Therefore, there are no simulated estimates of Org-TSS that might be transported downstream from the Keeyask forebay to Stephens Lake. To address this question, the potential peak Org-TSS concentration that might be discharged downstream is estimated based on a few simplifying assumptions. Org-TSS transported downstream will result from peat originating in the mainstem peat zones, Zones 1, 2 and 3, plus additional Org-TSS that mixes in from the backbay zones.

Most of the peat causing Org-TSS settles rapidly, with 90% or more of the mass settling over 1.5 m per hour for even the slowest settling sample that was tested and the majority of the peat enters in backbay areas. Thus, given that backbays are poorly mixed with the mainstem and the high percentage of material that settles rapidly, it is expected that much of the Org-TSS in backbays would settle out in the zone in which it originates rather than being transported downstream. To estimate the maximum Org-TSS concentration that might be transported downstream, it is assumed that the new hourly load of peat in the mainstem area, Zones 1, 2 and 3 combined, is equal to the load originating in these zones plus 25% of the hourly load entering Zones 5 through 13. This assumes that 75% of the load originating in backbay areas remains in those areas due to settling.

The resulting total hourly peat load is assumed to be mixed in the total volume of Zones 1, 2 and 3 to give the assumed new Org-TSS load entering each hour. The maximum Org-TSS concentration caused by carry-over effects due to settling is greater than the new hourly loading. Based on estimated average mainstem depth (total Zone 1, 2, 3 volume divided by total area of these zones) and using the slowest settling profile of the peat samples tested, a multiplication factor is identified that is used to calculate the hourly maximum Org-TSS from the new hourly Org-TSS loading. This hourly maximum Org-TSS is assumed to represent the highest concentration that might be transported downstream to Stephens Lake: actual Org-TSS concentrations transported downstream are expected to be lower.

3 RESULTS

3.1 ESTIMATED RANGES OF MINIMUM-MAXIMUM ORG-TSS CONCENTRATION INCREASES

Using the five measured settling-velocity distributions (Table 2-3) for the five different load rates in the first five years (Table 2-1), a total of 25 different sets of results were generated. Peat sample TSS-20 results in the highest estimated peak Org-TSS concentrations because it has the highest percentage of material with slow settling velocities, which results in a higher amount of Org-TSS being available for carry-over to subsequent hours. Conversely, the settling velocity profile for peat sample TSS-21 results in the lowest peak Org-TSS levels. Summary maximum (beginning of hour) and minimum (end of hour) Org-TSS values were calculated for water depths of 0-10m in 1m increments, for each peat transport zone in each year (1 through 5) using the five settling-velocity profiles (Appendices B-F).

Table 3-1 summarizes the estimated Year 1 minimum to maximum range of Org-TSS increase using the slow TSS-20 settling profile. The deepest areas of a zone have the highest Org-TSS concentrations after accounting for carry-over effects and the zones with the highest loading have the greatest Org-TSS overall. In Year 1, peat zones 7, 8, 9, 11 and 12 have the highest hourly Org-TSS loadings. In Zone 8, which has the highest loading rate, the deepest areas are 5-6 m in depth and these areas have a minimum to maximum Org-TSS range is 18-21 mg/L. The next most affected zone, Zone 11, has an Org-TSS range of 13-15 mg/L in its deepest area. In the zones with the lowest load rates, Zones 1, 2, 3, 5, 10 and 13, the peak Org-TSS levels in Year 1 are 4 mg/L or less even in the deepest areas. At the average depths of the different zones (highlighted values in Table 3-1) the highest maximum concentration due to carry-over effects are 7 mg/L or less in all zones, and 3 mg/L or less in 7 of the 11 zones.

Table 3-2 summarizes the estimated Year 5 minimum to maximum range of Org-TSS, again using the slow TSS-20 settling-velocity profile. Because Year 5 loadings are much lower than Year 1, the peak Org-TSS concentrations are 1 mg/L or less, even in the deepest areas of each zone. This is less than the typical laboratory detection limit for total suspended solids.

Results using the slow TSS-20 settling profile show that, if a large fraction of the Org-TSS has a very slow settling rate, the maximum Org-TSS concentration can end up being substantially larger than the hourly Org-TSS loading due to carry-over effects. The highest Year 1 Org-TSS concentration, 21 mg/L in Zone 8, is about six times greater than the new hourly load for this zone. In areas up to 10 m depth, the peak Org-TSS is up to 10 times greater than the hourly loading. In Year 5, the hourly loadings are small enough

that the carry-over effects are not great enough to cause high Org-TSS concentrations in any area.

YEAR 1 range of Org-TSS (mg/L): Min-Max Range With Hourly Loading
Peat Settling Distribution : TSS-20 SLOW

Range of Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	<1	<1	<1	<1	<1 - 2	1 - 5	1 - 2	<1 - 1	1 - 3	<1 - 1	<1
1 - 2	<1	<1	<1	<1 - 1	2 - 3	4 - 7	2 - 4	<1 - 1	2 - 4	1 - 2	<1 - 1
2 - 3	<1	<1 - 1	<1	1 - 1	3 - 4	7 - 11	4 - 6	1 - 1	4 - 6	2 - 3	1 - 1
3 - 4	<1	1 - 1	<1	1 - 1	4 - 6	11 - 14	6 - 8	1 - 2	6 - 8	3 - 4	1 - 1
4 - 5	<1	1 - 1	<1	1 - 1	6 - 7	14 - 18	--	2 - 2	9 - 11	4 - 5	1 - 2
5 - 6	<1	1 - 1	<1	1 - 2	7 - 9	18 - 21	--	2 - 3	11 - 13	5 - 6	2 - 2
6 - 7	<1	1 - 1	<1	2 - 2	9 - 10	--	--	3 - 3	13 - 15	6 - 7	2 - 2
7 - 8	<1 - 1	1 - 1	<1	2 - 2	--	--	--	3 - 4	--	7 - 8	2 - 3
8 - 9	1 - 1	1 - 2	<1	--	--	--	--	--	--	8 - 9	3 - 3
9 - 10	1 - 1	2 - 2	<1	--	--	--	--	--	--	--	--

Org-TSS at the average depth of each peat zone is idicated by highlighted values

Table 3-1: Hourly Minimum - Maximum Range of Org-TSS Increase – Year 1, TSS-20 Settling Profile

YEAR 5 range of Org-TSS (mg/L): Min-Max Range With Hourly Loading
Peat Settling Distribution : TSS-20 SLOW

Range of Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1 - 2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2 - 3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3 - 4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
4 - 5	<1	<1	<1	<1	<1	<1 - 1	--	<1	<1	<1	<1
5 - 6	<1	<1	<1	<1	<1	1 - 1	--	<1	<1	<1 - 1	<1
6 - 7	<1	<1	<1	<1	<1	--	--	<1	<1	1 - 1	<1
7 - 8	<1	<1	<1	<1	--	--	--	<1 - 1	--	1 - 1	<1
8 - 9	<1	<1	<1	--	--	--	--	--	--	1 - 1	<1
9 - 10	<1	<1	<1	--	--	--	--	--	--	--	--

Org-TSS at the average depth of each peat zone is idicated by highlighted values

Table 3-2: Hourly Minimum - Maximum Range of Org-TSS Increase – Year 5, TSS-20 Settling Profile

Tables 3-3 and 3-4 respectively summarize the Year 1 and Year 5 hourly minimum to maximum ranges of Org-TSS concentration increases using the fast settling profile of peat sample TSS-21. For Zone 8 the hourly Org-TSS load is again 3.39 mg/L but, because of the faster settling rate, the minimum to maximum Org TSS concentrations in the 5-6 m depth range are 11-14 mg/L, about 7 mg/L lower than the concentration at the slow settling rate. In Year 5, the faster settling rate results in peak Org-TSS concentration increases of 1 mg/L or less in all zones and depth ranges, which is less than the typical detection limit for total suspended solids.

In Years 2, 3, and 4, the peat loads are intermediate between the high loading of Year 1 and the low loading of Year 5. Based on the slow settling profile, sample TSS-20, maximum Org-TSS concentration increases in all zones and depth ranges in Years 2, 3, and 4 are equal to or less than 4 mg/L, 2 mg/L and 1 mg/L respectively.

Year 1 produces the highest increases in Org-TSS concentrations, with maximum Org-TSS concentrations that are about 5 times greater than the corresponding changes in Year 2, which is the year with the next highest loading of peat to the reservoir. Beyond Year 5, the peat loads are expected to continue declining, which will result in maximum Org-TSS concentration increases of less than 1 mg/L, with increases likely near 0 over most of the reservoir.

YEAR 1 range of Org-TSS (mg/L): Min-Max Range With Hourly Loading
Peat Settling Distribution : TSS-21 FAST

Range of Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	<1	<1	<1	<1	<1 - 2	1 - 4	<1 - 2	<1 - 1	<1 - 2	<1 - 1	<1
1 - 2	<1	<1	<1	<1	1 - 2	2 - 5	1 - 3	<1 - 1	1 - 3	<1 - 1	<1
2 - 3	<1	<1	<1	<1 - 1	2 - 3	4 - 7	2 - 4	1 - 1	2 - 4	1 - 2	<1 - 1
3 - 4	<1	<1	<1	<1 - 1	3 - 4	6 - 10	3 - 5	1 - 1	4 - 6	2 - 3	1 - 1
4 - 5	<1	<1 - 1	<1	1 - 1	3 - 5	8 - 12	--	1 - 2	5 - 7	2 - 3	1 - 1
5 - 6	<1	1 - 1	<1	1 - 1	4 - 6	11 - 14	--	1 - 2	6 - 8	3 - 4	1 - 1
6 - 7	<1	1 - 1	<1	1 - 1	5 - 7	--	--	2 - 2	7 - 10	3 - 4	1 - 1
7 - 8	<1	1 - 1	<1	1 - 1	--	--	--	2 - 2	--	4 - 5	1 - 2
8 - 9	<1	1 - 1	<1	--	--	--	--	--	--	5 - 6	2 - 2
9 - 10	<1	1 - 1	<1	--	--	--	--	--	--	--	--

Org-TSS at the average depth of each peat zone is idicated by highlighted values

Table 3-3: Hourly Minimum - Maximum Range of Org-TSS – Year 1, TSS-21 Settling Profile

YEAR 5 range of Org-TSS (mg/L): Min-Max Range With Hourly Loading
Peat Settling Distribution : TSS-21 FAST

Range of Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1 - 2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2 - 3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3 - 4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
4 - 5	<1	<1	<1	<1	<1	<1	--	<1	<1	<1	<1
5 - 6	<1	<1	<1	<1	<1	<1	--	<1	<1	<1	<1
6 - 7	<1	<1	<1	<1	<1	--	--	<1	<1	<1	<1
7 - 8	<1	<1	<1	<1	--	--	--	<1	--	<1	<1
8 - 9	<1	<1	<1	--	--	--	--	--	--	<1 - 1	<1
9 - 10	<1	<1	<1	--	--	--	--	--	--	--	--

Org-TSS at the average depth of each peat zone is idicated by highlighted values

Table 3-4: Hourly Minimum - Maximum Range of Org-TSS – Year 5, TSS-21 Settling Profile

It should be noted that the calculated Org-TSS concentrations are based on assumed loading rates averaged across the volume of the different peat transport zones. Actual concentrations are expected to be variable and non-uniform. While it can be expected that locally higher or lower concentrations will be observed, it is not possible to practically determine variable the Org-TSS concentration might be. Additionally, while Org-TSS estimates are low for shallow (low total depth) areas, locally elevated Org-TSS concentrations may occur near shorelines because shoreline peat doesn't break down uniformly or where wave action causes re-suspension.

3.2 ESTIMATED MAXIMUM ORG-TSS CONCENTRATION ICREASE THAT MAY BE TRANSPORTED INTO STEPHENS LAKE

For this analysis, the new hourly loading of Org-TSS in Zones 1, 2 and 3 combined that might be transported downstream is about 0.1 mg/L. This is based on an estimated hourly suspended peat loading of 45 tonnes (Zone 1, 2 and 3 load plus 25% of Zone 5-13 load) into a total volume of about $433x10^6$ cubic metres in Zones 1, 2 and 3. Given an average depth of 7.9 m in Zones 1, 2 and 3 and based on carry-over effects due to settling for the slowest settling profile (i.e., sample TSS-20), the maximum hourly Org-TSS concentration increase is approximately 9 times greater than the hourly loading of 0.1 mg/L. Thus, the estimated maximum Org-TSS concentration increase that might be transported downstream is approximately 0.9 mg/L, or less than 1 mg/L.

4 CONCLUSION

The highest loadings of peat to the forebay occur in the first year after impoundment, which causes the highest Org-TSS concentration increases. In Year 1, peat transport zones 7, 8, 9, 11 and 12 have the highest loadings of peat and the highest hourly maximum Org-TSS concentrations occur in the deepest part of each zone. Based on settling properties for the slowest settling peat sample (sample TSS-20), the highest average hourly maximum Org-TSS concentration increase in Zones 7, 8, 9, 11 and 12 are 10, 21, 8, 15 and 9 mg/L respectively. The hourly maximum Org-TSS concentrations are lower in shallower areas of these zones. Within the average depth ranges for Zones 7, 8, 9, 11 and 12, the hourly maximum Org-TSS concentration increases are 4, 7, 4, 6 and 3 mg/L respectively, or about 50-60% lower than the highest value in the deepest area for each zone. The Org-TSS increases in these 5 zones would be detectable. In the less affected areas, Zones 1, 2, 3, 5, 10 and 13, the highest hourly maximum Org-TSS concentration increases are all 4 mg/L or less. Hourly maximum Org-TSS concentrations in the average depth range for these zones are 1 mg/L or less for each zone except Zone 10 where it is about 2 mg/L. In these 6 zones the Org-TSS concentration increase may not be detectable using normal laboratory test procedures. Because the deeper areas where the highest hourly maximum Org-TSS concentrations occur are limited in extent, it is expected that most of the reservoir would experience Org-TSS concentration increases of less than 10 mg/L.

In Year 2 the Org –TSS levels drop substantially compared with Year 1 such that most areas experience hourly maximum Org-TSS concentrations of 2 mg/L or less. By Year 5 the maximum Org-TSS levels are all 1 mg/L or less. Beyond Year 5 the loading of peat to the reservoir continues to decline so hourly maximum Org-TSS would also decrease. In Years 2 and beyond the Org-TSS increase may not be detectable using standard laboratory testing.

The potential Org-TSS concentration that might be transported downstream is expected to be less than 1 mg/L, even in Year 1 when the highest loadings of peat to the reservoir occur. Existing Org-TSS is typically less than 2 mg/L (below lab detection limit), therefore the increase due to the Project may not be detectable.

5 GLOSSARY

6 REFERENCES

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APPENDIX A

Calculation of Year 1, 2, 3, 4 and 5 Hourly New Organic TSS Loadings

Year 1
Estimated Hourly Load of New Org-TSS Entering Each Peat Transport Zone

The analysis only considers the SUSPENDED fraction of the peat mass entering each zone at the start of each day.
The floating fraction is not included as part of the Org-TSS because it is not actually dispersed in the water column.
The analysis uses reduction factors as applied in BOD calculations for the T&DO Study because this method was developed in the T&DO Study.

Zone[1]	Zone Area (ha)	Volume of Zone[2] (m^3)	Resurface (tonnes)	Breakdown (tonnes)	Total Mass Peat[3] (tonnes)	Mass Resurface Suspended (tonnes)	Mass Breakdown Suspended (tonnes)	Year 1 Resurf-Susp TSS (mg/L)	Year 1 Brkdn-Susp TSS (mg/L)	Year 1 Organic TSS (mg/L)
1	3,009	256,594,959	108,334	125,455	233,789	51,996	9,095	0.0	0.0	**0.07**
2	727	46,582,028	69,013	21,153	90,166	31,142	1,599	0.2	0.0	**0.17**
3	1,733	129,574,537	21,530	30,856	52,385	11,180	2,348	0.0	0.0	**0.03**
5	118	4,612,741	7,443	11,318	18,761	3,046	864	0.2	0.1	**0.26**
7	281	7,110,731	72,770	55,402	128,172	32,673	4,253	1.1	0.4	**1.41**
8	108	1,606,729	50,204	13,802	64,006	21,077	1,055	3.0	0.4	**3.39**
9	198	3,704,560	88,301	7,005	95,306	28,440	502	1.8	0.1	**1.84**
10	262	8,104,958	22,144	19,958	42,102	12,117	1,525	0.3	0.1	**0.45**
11	286	5,927,116	100,820	60,682	161,502	39,943	4,693	1.5	0.5	**2.01**
12	914	23,958,133	175,662	106,376	282,038	75,529	8,151	0.7	0.2	**0.92**
13	192	6,489,245	7,300	26,782	34,082	3,285	2,070	0.1	0.2	**0.31**
	7,827	**494,265,737**	**723,520**	**478,789**	**1,202,309**	**310,428**	**36,155**	0.14	0.04	**0.19**

1) Zone 4 not in modeled area
2) from MIKE 3 model
3) from ECOSTEM - total mass includes all suspended, float and sink masses 0.038461538

Resurfaced Suspension Peat - Estimation of mass that is suspended (BOD) in the water column

factor	tonnes	Notes	reference
100%	310,428	starting amount (total year 1)	PD+ES
3.85%	11,940	assume even loading over 26 week period	
14%	1,706	assume even loading over 7 days each week	
4.17%	71	assume even loading over each hour	
	0.023%	***Fraction of Resurface Suspended mass that contributes to Org-TSS each hour***	

Breakdown Suspended Peat - Estimation of mass that is suspended (BOD) in the water column

factor	tonnes	Notes	reference
100%	36,155	starting amount (total year 1)	PD+ES
10%	3615	assume an event that contributes 2.5 times the amount that would enter if evenly distributed in each week	event based vs. continous
14%	516	assume even loading over 7 days each week	
4.17%	22	assume even loading over each hour	
	0.060%	***Fraction of Breakdown Suspended mass that contributes to Org-TSS each hour***	

Years 2, 3, 4 & 5
Estimated Hourly Load of New Org-TSS Entering Each Peat Transport Zone

The analysis only considers the SUSPENDED fraction of the peat mass entering each zone at the start of each day.
The floating fraction is not included as part of the Org-TSS because it is not actually dispersed in the water column.
The analysis uses reduction factors as applied in BOD calculations for the T&DO Study because this method was developed in the T&DO Study.

										assumed fraction of total Year 2-5 Peat entering in each year :			
										50%	25%	15%	10%
Zone[1]	Zone Area (ha)	Volume of Zone[2] (m^3)	Resurface (tonnes)	Breakdown (tonnes)	Total Mass Peat[3] (tonnes)	Mass Resurface Suspended (tonnes)	Mass Breakdown Suspended (tonnes)	Year 2-5 Resurf-Susp Org-TSS (mg/L)	Year 2-5 Brkdn-Susp Org-TSS (mg/L)	Year 2 Organic TSS (mg/L)	Year 3 Organic TSS (mg/L)	Year 4 Organic TSS (mg/L)	Year 5 Organic TSS (mg/L)
1	3,088	260,075,860	72,801	50,288	123,089	31,425	3,645	0.0	0.0	**0.02**	**0.01**	**0.01**	**0.00**
2	698	44,614,879	57,625	15,689	73,314	24,622	1,200	0.1	0.0	**0.07**	**0.04**	**0.02**	**0.01**
3	1,752	129,555,476	51,950	6,542	58,492	22,812	483	0.0	0.0	**0.02**	**0.01**	**0.01**	**0.00**
5	129	5,505,527	2,772	9,602	12,374	1,081	748	0.0	0.1	**0.06**	**0.03**	**0.02**	**0.01**
7	304	8,070,490	48,855	14,190	63,045	19,870	1,077	0.6	0.1	**0.32**	**0.16**	**0.10**	**0.06**
8	126	2,377,696	19,651	13,289	32,939	8,282	1,019	0.8	0.3	**0.53**	**0.26**	**0.16**	**0.11**
9	203	3,941,835	29,852	8,872	38,724	7,667	678	0.4	0.1	**0.27**	**0.14**	**0.08**	**0.05**
10	267	8,448,887	42,559	4,815	47,375	21,430	361	0.6	0.0	**0.30**	**0.15**	**0.09**	**0.06**
11	305	6,662,667	19,097	14,835	33,932	7,583	1,136	0.3	0.1	**0.18**	**0.09**	**0.05**	**0.04**
12	949	24,613,490	175,679	123,453	299,132	72,252	9,659	0.7	0.2	**0.45**	**0.23**	**0.14**	**0.09**
13	177	5,946,729	12,383	3,285	15,668	5,451	249	0.2	0.0	**0.12**	**0.06**	**0.04**	**0.02**
	7,998	**499,813,536**	**533,224**	**264,859**	**798,084**	**222,475**	**20,255**	0.1	0.0	**0.06**	**0.03**	**0.02**	**0.01**

1) Zone 4 not in modeled area
2) from MIKE 3 model
3) from ECOSTEM - total mass includes all suspended, float and sink masses

Resurfaced Suspension Peat - Estimation of mass that is suspended (BOD) in the water column

factor	tonnes	Notes	reference
100%	222,475	starting amount (total years 2-5)	PD+ES
3.85%	8,557	assume even loading over 26 week period	
14%	1,222	assume even loading over 7 days each week	
4.17%	51	assume even loading over each hour	
	0.023%	***Fraction of Resurface Suspended mass that contributes to Org-TSS each hour***	

Breakdown Suspended Peat - Estimation of mass that is suspended (BOD) in the water column

factor	tonnes	Notes	reference
100%	20,255	starting amount (total year 1)	PD+ES
10%	2025	assume an event that contributes 2.5 times the amount that would enter if evenly distributed	event based vs. continous
14%	289	amount entering on one day in the week if evenly distributed	
4.17%	12	anount that enters each hour if evenly distributed	
	0.060%	***Fraction of Breakdown Suspended mass that contributes to Org-TSS each hour***	

APPENDIX B

Summary of Calculations of Peat Settling Rate Profiles

Peat Sample ID: TSS-20			PLANNED SETTLING TEST DURATION						
			0.5 hour	1.75 hour	6 hour	18 hour	42 hour	units	calculation
	Start date/time	t1	3/26/10 12:00	3/25/10 9:00	3/25/10 9:30	3/25/10 16:00	3/16/10 16:00		from Ecostem
	End date/time	t2	3/26/10 12:30	3/25/10 10:45	3/25/10 15:30	3/26/10 9:00	3/18/10 10:00		from Ecostem
	Actual Test Duration		0.50	1.75	6.00	17.00	42.00	h	t2-t1
	Water Depth in Settling Drum		80	80	80	80	80	cm	from Ecostem
	Water Volume in Settling Drum	Vd	179.5	179.5	179.5	179.5	179.5	L	from Ecostem
PEAT MAT (peat remaining after sample agitation)									
	Mass - peat mat	Mm	6.6	32.4	4.1	11.7	18.3	g	from Ecostem
FLOATING PEAT									
	Mass - floating peat	Mf	2.3	2.3	2.7	2.3	6.1	g	from Ecostem
SUSPENDED PEAT									
	Suspended TSS in barrel (lab test)	SUtss	127.5	25.5	21.5	13.0	17.0	mg/L	from Ecostem
	Mass - suspended peat	Msu	22.89	4.58	3.86	2.33	3.05	g	Vd x SUtss
SETTLED PEAT									
	Mass - filtered peat residue	m1	221.6	202.6	204	177	371.1	g	from Ecostem
	Volume filtered	Vf	175.5	175.5	175.5	175.5	175.5	L	from Ecostem
	Filtrate TSS (lab test)	Ftss	47.5	47.5	47.5	47.5	47.5	mg/L	from Ecostem
	Mass - peat in filtrate	m2	8.3	8.3	8.3	8.3	8.3	g	Ftss x Vf
	Mass - remaining suspended	m3	22.4	4.5	3.8	2.3	3.0	g	Sutss x Vf
	Mass - settled	Mse	207.6	206.5	208.6	183.1	376.5	mg	m1 + m2 - m3
MASS TOTALS									
	Mass - Total	Mt	239.3	245.7	219.2	199.4	403.9	g	Mm + Mf + Mse + Msu
	Mass - non-suspended	Mns	216.5	241.2	215.4	197.1	400.9	g	Mm + Mf + Mse
	Mass - settled + suspended only	Mss	230.4	211.0	212.4	185.4	379.5	g	Mse + Msu
PERCENTAGES									
	% Non-Supended - from total mass	%Rt	90.44%	98.14%	98.24%	98.83%	99.24%	%	Mns / Mt x100
	% Suspended - from total mass	%St	9.56%	1.86%	1.76%	1.17%	0.76%	%	Msu / Mt x100
	% Settled - settle+suspend only	%Se	90.07%	97.83%	98.18%	98.74%	99.20%	%	Mse / Mss x100
	% Suspended - settle+suspend only	%Su	9.93%	2.17%	1.82%	1.26%	0.80%	%	Msu / Mss x100

Actual Duration (h)	Rate (m/day)	Rate (m/h)	% of Mass Settled	% of Mass at Settling Rate	% of Mass Slower
0.50	38.40	1.600	90.07%	90.07%	9.93%
1.7	10.97	0.457	97.83%	7.76%	2.17%
6.0	3.20	0.133	98.18%	0.35%	1.82%
17.0	1.13	0.047	98.74%	0.56%	1.26%
42.0	0.46	0.019	99.20%	0.45%	0.80%
assumed	0.20	0.008	100.00%	0.80%	0.00%

Peat Sample ID: TSS-21			PLANNED SETTLING TEST DURATION						
			0.5 hour	1.75 hour	6 hour	18 hour	42 hour	units	calculation
	Start date/time	t1	3/25/10 8:00	3/18/10 11:45	3/18/10 8:05	3/25/10 15:00	3/16/10 15:00		from Ecostem
	End date/time	t2	3/25/10 8:30	3/18/10 13:35	3/18/10 14:20	3/26/10 9:00	3/18/10 9:00		from Ecostem
	Actual Test Duration		0.50	1.83	6.25	18.00	42.00	h	t2-t1
	Water Depth in Settling Drum		80	80	80	80	80	cm	from Ecostem
	Water Volume in Settling Drum	Vd	179.5	179.5	179.5	179.5	179.5	L	from Ecostem
PEAT MAT (peat remaining after sample agitation)									
	Mass - peat mat	Mm	31.2	5.6	20.7	9.9	10.5	g	from Ecostem
FLOATING PEAT									
	Mass - floating peat	Mf	0	2.2	2.3	2.3	2.3	g	from Ecostem
SUSPENDED PEAT									
	Suspended TSS in barrel (lab test)	SUtss	97.5	15.5	6.5	7.0	3.0	mg/L	from Ecostem
	Mass - suspended peat	Msu	17.50	2.78	1.17	1.26	0.54	g	Vd x SUtss
SETTLED PEAT									
	Mass - filtered peat residue	m1	212.8	132.2	157.7	149.6	150.2	g	from Ecostem
	Volume filtered	Vf	175.5	175.5	175.5	175.5	175.5	L	from Ecostem
	Filtrate TSS (lab test)	Ftss	364.0	364.0	364.0	364.0	364.0	mg/L	from Ecostem
	Mass - peat in filtrate	m2	63.9	63.9	63.9	63.9	63.9	g	Ftss x Vf
	Mass - remaining suspended	m3	17.1	2.7	1.1	1.2	0.5	g	Sutss x Vf
	Mass - settled	Mse	259.6	193.4	220.4	212.3	213.6	mg	m1 + m2 - m3
MASS TOTALS									
	Mass - Total	Mt	308.3	203.9	244.6	225.7	226.9	g	Mm + Mf + Mse + Msu
	Mass - non-suspended	Mns	290.8	201.2	243.4	224.5	226.4	g	Mm + Mf + Mse
	Mass - settled + suspended only	Mss	277.1	196.1	221.6	213.5	214.1	g	Mse + Msu
PERCENTAGES									
	% Non-Supended - from total mass	%Rt	94.32%	98.64%	99.52%	99.44%	99.76%	%	Mns / Mt x100
	% Suspended - from total mass	%St	5.68%	1.36%	0.48%	0.56%	0.24%	%	Msu / Mt x100
	% Settled - settle+suspend only	%Se	93.68%	98.58%	99.47%	99.41%	99.75%	%	Mse / Mss x100
	% Suspended - settle+suspend only	%Su	6.32%	1.42%	0.53%	0.59%	0.25%	%	Msu / Mss x100

Actual Duration (h)	Rate (m/day)	Rate (m/h)	% of Mass Settled	% of Mass at Settling Rate	% of Mass Slower
0.50	38.40	1.600	93.68%	93.68%	6.32%
1.8	10.47	0.436	98.58%	4.90%	1.42%
6.2	3.07	0.128	99.47%	0.89%	0.53%
18.0	1.07	0.044	99.41%	-0.06%	0.59%
42.0	0.46	0.019	99.75%	0.34%	0.25%
assumed	0.20	0.008	100.00%	0.25%	0.00%

Peat Sample ID: TSS-22			PLANNED SETTLING TEST DURATION						
			0.5 hour	1.75 hour	6 hour	18 hour	42 hour	units	calculation
	Start date/time	t1	3/16/10 9:00	3/16/10 8:30	3/16/10 8:00	3/25/10 14:00	3/16/10 14:30		from Ecostem
	End date/time	t2	3/16/10 9:30	3/16/10 10:15	3/16/10 14:00	3/26/10 8:00	3/18/10 8:30		from Ecostem
	Actual Test Duration		0.50	1.75	6.00	18.00	42.00	h	t2-t1
	Water Depth in Settling Drum		80	80	80	80	80	cm	from Ecostem
	Water Volume in Settling Drum	Vd	179.5	179.5	179.5	179.5	179.5	L	from Ecostem
PEAT MAT (peat remaining after sample agitation)									
	Mass - peat mat	Mm	0.4	16.4	8.8	0.9	3.1	g	from Ecostem
FLOATING PEAT									
	Mass - floating peat	Mf	7.7	0.2	0	0	0	g	from Ecostem
SUSPENDED PEAT									
	Suspended TSS in barrel (lab test)	SUtss	82.0	53.0	20.5	17.5	10.5	mg/L	from Ecostem
	Mass - suspended peat	Msu	14.72	9.51	3.68	3.14	1.88	g	Vd x SUtss
SETTLED PEAT									
	Mass - filtered peat residue	m1	302.1	198.4	195.7	209.7	195.7	g	from Ecostem
	Volume filtered	Vf	175.5	175.5	175.5	175.5	175.5	L	from Ecostem
	Filtrate TSS (lab test)	Ftss	329.5	329.5	329.5	329.5	329.5	mg/L	from Ecostem
	Mass - peat in filtrate	m2	57.8	57.8	57.8	57.8	57.8	g	Ftss x Vf
	Mass - remaining suspended	m3	14.4	9.3	3.6	3.1	1.8	g	Sutss x Vf
	Mass - settled	Mse	345.5	246.9	249.9	264.5	251.7	mg	m1 + m2 - m3
MASS TOTALS									
	Mass - Total	Mt	368.4	273.0	262.4	268.5	256.7	g	Mm + Mf + Mse + Msu
	Mass - non-suspended	Mns	353.6	263.5	258.7	265.4	254.8	g	Mm + Mf + Mse
	Mass - settled + suspended only	Mss	360.3	256.4	253.6	267.6	253.6	g	Mse + Msu
PERCENTAGES									
	% Non-Supended - from total mass	%Rt	96.00%	96.52%	98.60%	98.83%	99.27%	%	Mns / Mt x100
	% Suspended - from total mass	%St	4.00%	3.48%	1.40%	1.17%	0.73%	%	Msu / Mt x100
	% Settled - settle+suspend only	%Se	95.91%	96.29%	98.55%	98.83%	99.26%	%	Mse / Mss x100
	% Suspended - settle+suspend only	%Su	4.09%	3.71%	1.45%	1.17%	0.74%	%	Msu / Mss x100

Actual Duration (h)	Rate (m/day)	Rate (m/h)	% of Mass Settled	% of Mass at Settling Rate	% of Mass Slower
0.50	38.40	1.600	95.91%	95.91%	4.09%
1.8	10.97	0.457	96.29%	0.38%	3.71%
6.0	3.20	0.133	98.55%	2.26%	1.45%
18.0	1.07	0.044	98.83%	0.28%	1.17%
42.0	0.46	0.019	99.26%	0.43%	0.74%
assumed	0.20	0.008	100.00%	0.74%	0.00%

Peat Sample ID: TSS-23			PLANNED SETTLING TEST DURATION						
			1.75 hour	5 hour	12 hour	27 hour	50 hour	units	calculation
	Start date/time	t1	1/25/10 9:05	1/25/10 8:05	1/25/10 7:05	1/25/10 10:05	1/25/10 11:05		from Ecostem
	End date/time	t2	1/25/10 10:51	1/25/10 13:09	1/25/10 18:30	1/26/10 12:54	1/27/10 13:05		from Ecostem
	Actual Test Duration		1.77	5.07	11.42	26.82	50.00	h	t2-t1
	Water Depth in Settling Drum		80	80	80	80	80	cm	from Ecostem
	Water Volume in Settling Drum	Vd	179.5	179.5	179.5	179.5	179.5	L	from Ecostem
PEAT MAT (peat remaining after sample agitation)									
	Mass - peat mat	Mm	31.1	64.5	73.1	39.8	74.8	g	from Ecostem
FLOATING PEAT									
	Mass - floating peat	Mf	0	0.2	0.1	0.1	0.1	g	from Ecostem
SUSPENDED PEAT									
	Suspended TSS in barrel (lab test)	SUtss	50.8	7.3	3.1	4.0	4.4	mg/L	from Ecostem
	Mass - suspended peat	Msu	9.12	1.30	0.56	0.72	0.78	g	Vd x SUtss
SETTLED PEAT									
	Mass - filtered peat residue	m1	178.5	227.7	135.4	214.3	203.1	g	from Ecostem
	Volume filtered	Vf	175.5	175.5	175.5	175.5	175.5	L	from Ecostem
	Filtrate TSS (lab test)	Ftss	206.3	244.5	177.5	227.0	279.3	mg/L	from Ecostem
	Mass - peat in filtrate	m2	36.2	42.9	31.2	39.8	49.0	g	Ftss x Vf
	Mass - remaining suspended	m3	8.9	1.3	0.5	0.7	0.8	g	Sutss x Vf
	Mass - settled	Mse	205.8	269.3	166.0	253.4	251.3	mg	m1 + m2 - m3
MASS TOTALS									
	Mass - Total	Mt	246.0	335.3	239.8	294.1	327.0	g	Mm + Mf + Mse + Msu
	Mass - non-suspended	Mns	236.9	334.0	239.2	293.3	326.2	g	Mm + Mf + Mse
	Mass - settled + suspended only	Mss	214.9	270.6	166.6	254.2	252.1	g	Mse + Msu
PERCENTAGES									
	% Non-Supended - from total mass	%Rt	96.29%	99.61%	99.77%	99.76%	99.76%	%	Mns / Mt x100
	% Suspended - from total mass	%St	3.71%	0.39%	0.23%	0.24%	0.24%	%	Msu / Mt x100
	% Settled - settle+suspend only	%Se	95.76%	99.52%	99.67%	99.72%	99.69%	%	Mse / Mss x100
	% Suspended - settle+suspend only	%Su	4.24%	0.48%	0.33%	0.28%	0.31%	%	Msu / Mss x100

Actual Duration (h)	Rate (m/day)	Rate (m/h)	% of Mass Settled	% of Mass at Settling Rate	% of Mass Slower
1.77	10.87	0.453	95.76%	95.76%	4.24%
5.1	3.79	0.158	99.52%	3.76%	0.48%
11.4	1.68	0.070	99.67%	0.15%	0.33%
26.8	0.72	0.030	99.72%	0.05%	0.28%
50.0	0.38	0.016	99.69%	-0.03%	0.31%
assumed	0.20	0.008	100.00%	0.31%	0.00%

Peat Sample ID: TSS-24			PLANNED SETTLING TEST DURATION						
			0.5 hour	1.75 hour	6 hour	18 hour	42 hour	units	calculation
	Start date/time	t1	3/25/10 10:15	3/25/10 11:00	3/26/10 8:30	3/25/10 16:45	3/16/10 16:32		from Ecostem
	End date/time	t2	3/25/10 10:45	3/25/10 12:45	3/26/10 14:30	3/26/10 11:00	3/18/10 10:45		from Ecostem
	Actual Test Duration		0.50	1.75	6.00	18.25	42.22	h	t2-t1
	Water Depth in Settling Drum		80	80	80	80	80	cm	from Ecostem
	Water Volume in Settling Drum	Vd	179.5	179.5	179.5	179.5	179.5	L	from Ecostem
PEAT MAT (peat remaining after sample agitation)									
	Mass - peat mat	Mm	2.3	5.2	3.2	4.8	4.4	g	from Ecostem
FLOATING PEAT									
	Mass - floating peat	Mf	0	2.3	2.2	2.2	0	g	from Ecostem
SUSPENDED PEAT									
	Suspended TSS in barrel (lab test)	SUtss	82.5	14.0	12.0	6.0	6.0	mg/L	from Ecostem
	Mass - suspended peat	Msu	14.81	2.51	2.15	1.08	1.08	g	Vd x SUtss
SETTLED PEAT									
	Mass - filtered peat residue	m1	158.4	194.5	204.3	166.1	127.3	g	from Ecostem
	Volume filtered	Vf	175.5	175.5	175.5	175.5	175.5	L	from Ecostem
	Filtrate TSS (lab test)	Ftss	288.5	288.5	288.5	288.5	288.5	mg/L	from Ecostem
	Mass - peat in filtrate	m2	50.6	50.6	50.6	50.6	50.6	g	Ftss x Vf
	Mass - remaining suspended	m3	14.5	2.5	2.1	1.1	1.1	g	Sutss x Vf
	Mass - settled	Mse	194.6	242.7	252.8	215.7	176.9	mg	m1 + m2 - m3
MASS TOTALS									
	Mass - Total	Mt	211.7	252.7	260.4	223.8	182.4	g	Mm + Mf + Mse + Msu
	Mass - non-suspended	Mns	196.9	250.2	258.2	222.7	181.3	g	Mm + Mf + Mse
	Mass - settled + suspended only	Mss	209.4	245.2	255.0	216.8	178.0	g	Mse + Msu
PERCENTAGES									
	% Non-Supended - from total mass	%Rt	93.00%	99.01%	99.17%	99.52%	99.41%	%	Mns / Mt x100
	% Suspended - from total mass	%St	7.00%	0.99%	0.83%	0.48%	0.59%	%	Msu / Mt x100
	% Settled - settle+suspend only	%Se	92.93%	98.98%	99.16%	99.50%	99.39%	%	Mse / Mss x100
	% Suspended - settle+suspend only	%Su	7.07%	1.02%	0.84%	0.50%	0.61%	%	Msu / Mss x100

Actual Duration (h)	Rate (m/day)	Rate (m/h)	% of Mass Settled	% of Mass at Settling Rate	% of Mass Slower
0.50	38.40	1.600	92.93%	92.93%	7.07%
1.7	10.97	0.457	98.98%	6.05%	1.02%
6.0	3.20	0.133	99.16%	0.18%	0.84%
18.3	1.05	0.044	99.50%	0.35%	0.50%
42.2	0.45	0.019	99.39%	-0.11%	0.61%
assumed	0.20	0.008	100.00%	0.61%	0.00%

APPENDIX C

Year 1-5 Summary of Org-TSS Concentrations: Peat Sample TSS-20 Settling Profile

YEAR 1 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-20 SLOW

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	2	5	2	1	3	1	0
1 - 2	0	0	0	1	3	7	4	1	4	2	1
2 - 3	0	1	0	1	4	11	6	1	6	3	1
3 - 4	0	1	0	1	6	14	8	2	8	4	1
4 - 5	0	1	0	1	7	18	--	2	11	5	2
5 - 6	0	1	0	2	9	21	--	3	13	6	2
6 - 7	0	1	0	2	10	--	--	3	15	7	2
7 - 8	1	1	0	2	--	--	--	4	--	8	3
8 - 9	1	2	0	--	--	--	--	--	--	9	3
9 - 10	1	2	0	--	--	--	--	--	--	--	--
avg depth	8.5	6.4	7.5	3.9	2.5	1.5	1.9	3.1	2.1	2.6	3.4
Hourly New Org-TSS (mg/L)	**0.07**	**0.17**	**0.03**	**0.26**	**1.41**	**3.39**	**1.84**	**0.45**	**2.01**	**0.92**	**0.31**

YEAR 1 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-20 SLOW

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	1	1	0	1	0	0
1 - 2	0	0	0	0	2	4	2	0	2	1	0
2 - 3	0	0	0	1	3	7	4	1	4	2	1
3 - 4	0	1	0	1	4	11	6	1	6	3	1
4 - 5	0	1	0	1	6	14	--	2	9	4	1
5 - 6	0	1	0	1	7	18	--	2	11	5	2
6 - 7	0	1	0	2	9	--	--	3	13	6	2
7 - 8	0	1	0	2	--	--	--	3	--	7	2
8 - 9	1	1	0	--	--	--	--	--	--	8	3
9 - 10	1	2	0	--	--	--	--	--	--	--	--

YEAR 2 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-20 SLOW

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	1	0	0	0	1	0
1 - 2	0	0	0	0	1	1	1	1	0	1	0
2 - 3	0	0	0	0	1	2	1	1	1	1	0
3 - 4	0	0	0	0	1	2	1	1	1	2	0
4 - 5	0	0	0	0	2	3	--	2	1	2	1
5 - 6	0	0	0	0	2	3	--	2	1	3	1
6 - 7	0	1	0	0	2	--	--	2	1	3	1
7 - 8	0	1	0	1	--	--	--	3	--	4	1
8 - 9	0	1	0	--	--	--	--	--	--	4	1
9 - 10	0	1	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	**0.02**	**0.07**	**0.02**	**0.06**	**0.32**	**0.53**	**0.27**	**0.30**	**0.18**	**0.45**	**0.12**

YEAR 2 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-20 SLOW

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	1	0	0	0	0	0
2 - 3	0	0	0	0	1	1	1	1	0	1	0
3 - 4	0	0	0	0	1	2	1	1	1	1	0
4 - 5	0	0	0	0	1	2	--	1	1	2	0
5 - 6	0	0	0	0	2	3	--	2	1	2	1
6 - 7	0	0	0	0	2	--	--	2	1	3	1
7 - 8	0	1	0	0	--	--	--	2	--	3	1
8 - 9	0	1	0	--	--	--	--	--	--	4	1
9 - 10	0	1	0	--	--	--	--	--	--	--	--

YEAR 3 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-20 SLOW

	Peat Transport Zone										
Total Depth (m)	1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	1	0	0	0	0	0
2 - 3	0	0	0	0	1	1	0	0	0	1	0
3 - 4	0	0	0	0	1	1	1	1	0	1	0
4 - 5	0	0	0	0	1	1	--	1	0	1	0
5 - 6	0	0	0	0	1	2	--	1	1	1	0
6 - 7	0	0	0	0	1	--	--	1	1	2	0
7 - 8	0	0	0	0	--	--	--	1	--	2	0
8 - 9	0	0	0	--	--	--	--	--	--	2	1
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	0.01	0.04	0.01	0.03	0.16	0.26	0.14	0.15	0.09	0.23	0.06

YEAR 3 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-20 SLOW

	Peat Transport Zone										
Total Depth (m)	1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	1	0	0	0	0	0
3 - 4	0	0	0	0	1	1	0	0	0	1	0
4 - 5	0	0	0	0	1	1	--	1	0	1	0
5 - 6	0	0	0	0	1	1	--	1	0	1	0
6 - 7	0	0	0	0	1	--	--	1	1	1	0
7 - 8	0	0	0	0	--	--	--	1	--	2	0
8 - 9	0	0	0	--	--	--	--	--	--	2	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 4 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-20 SLOW

	Peat Transport Zone										
Total Depth (m)	1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	1	0	0	0	0	0
3 - 4	0	0	0	0	0	1	0	0	0	1	0
4 - 5	0	0	0	0	1	1	--	0	0	1	0
5 - 6	0	0	0	0	1	1	--	1	0	1	0
6 - 7	0	0	0	0	1	--	--	1	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	0.01	0.02	0.01	0.02	0.10	0.16	0.08	0.09	0.05	0.14	0.04

YEAR 4 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-20 SLOW

	Peat Transport Zone										
Total Depth (m)	1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	1	0	0	0	0	0
4 - 5	0	0	0	0	0	1	--	0	0	1	0
5 - 6	0	0	0	0	1	1	--	0	0	1	0
6 - 7	0	0	0	0	1	--	--	1	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 5 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-20 SLOW

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	1	--	0	0	0	0
5 - 6	0	0	0	0	0	1	--	0	0	1	0
6 - 7	0	0	0	0	0	--	--	0	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	0.00	0.01	0.00	0.01	0.06	0.11	0.05	0.06	0.04	0.09	0.02

YEAR 5 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-20 SLOW

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	0	--	0	0	0	0
5 - 6	0	0	0	0	0	1	--	0	0	0	0
6 - 7	0	0	0	0	0	--	--	0	0	1	0
7 - 8	0	0	0	0	--	--	--	0	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

APPENDIX D

Year 1-5 Summary Org-TSS Concentrations: Peat Sample TSS-21 Settling Profile

YEAR 1 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-21 FAST

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	2	4	2	1	2	1	0
1 - 2	0	0	0	0	2	5	3	1	3	1	0
2 - 3	0	0	0	1	3	7	4	1	4	2	1
3 - 4	0	0	0	1	4	10	5	1	6	3	1
4 - 5	0	1	0	1	5	12	--	2	7	3	1
5 - 6	0	1	0	1	6	14	--	2	8	4	1
6 - 7	0	1	0	1	7	--	--	2	10	4	1
7 - 8	0	1	0	1	--	--	--	2	--	5	2
8 - 9	0	1	0	--	--	--	--	--	--	6	2
9 - 10	0	1	0	--	--	--	--	--	--	--	--
avg depth	8.5	6.4	7.5	3.9	2.5	1.5	1.9	3.1	2.1	2.6	3.4
Hourly New Org-TSS (mg/L)	**0.07**	**0.17**	**0.03**	**0.26**	**1.41**	**3.39**	**1.84**	**0.45**	**2.01**	**0.92**	**0.31**

YEAR 1 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-21 FAST

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	1	0	0	0	0	0
1 - 2	0	0	0	0	1	2	1	0	1	0	0
2 - 3	0	0	0	0	2	4	2	1	2	1	0
3 - 4	0	0	0	0	3	6	3	1	4	2	1
4 - 5	0	0	0	1	3	8	--	1	5	2	1
5 - 6	0	1	0	1	4	11	--	1	6	3	1
6 - 7	0	1	0	1	5	--	--	2	7	3	1
7 - 8	0	1	0	1	--	--	--	2	--	4	1
8 - 9	0	1	0	--	--	--	--	--	--	5	2
9 - 10	0	1	0	--	--	--	--	--	--	--	--

YEAR 2 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-21 FAST

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	1	0	0	0	1	0
1 - 2	0	0	0	0	0	1	0	0	0	1	0
2 - 3	0	0	0	0	1	1	1	1	0	1	0
3 - 4	0	0	0	0	1	1	1	1	1	1	0
4 - 5	0	0	0	0	1	2	--	1	1	2	0
5 - 6	0	0	0	0	1	2	--	1	1	2	0
6 - 7	0	0	0	0	2	--	--	1	1	2	1
7 - 8	0	0	0	0	--	--	--	2	--	2	1
8 - 9	0	0	0	--	--	--	--	--	--	3	1
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	**0.02**	**0.07**	**0.02**	**0.06**	**0.32**	**0.53**	**0.27**	**0.30**	**0.18**	**0.45**	**0.12**

YEAR 2 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-21 FAST

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	1	0	0	0	1	0
3 - 4	0	0	0	0	1	1	0	1	0	1	0
4 - 5	0	0	0	0	1	1	--	1	0	1	0
5 - 6	0	0	0	0	1	2	--	1	1	1	0
6 - 7	0	0	0	0	1	--	--	1	1	2	0
7 - 8	0	0	0	0	--	--	--	1	--	2	1
8 - 9	0	0	0	--	--	--	--	--	--	2	1
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 3 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-21 FAST

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	1	0	0	0	0	0
3 - 4	0	0	0	0	0	1	0	0	0	1	0
4 - 5	0	0	0	0	1	1	--	1	0	1	0
5 - 6	0	0	0	0	1	1	--	1	0	1	0
6 - 7	0	0	0	0	1	--	--	1	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	0.01	0.04	0.01	0.03	0.16	0.26	0.14	0.15	0.09	0.23	0.06

YEAR 3 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-21 FAST

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	1	--	0	0	1	0
5 - 6	0	0	0	0	0	1	--	0	0	1	0
6 - 7	0	0	0	0	1	--	--	1	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 4 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-21 FAST

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	1	--	0	0	0	0
5 - 6	0	0	0	0	0	1	--	0	0	1	0
6 - 7	0	0	0	0	0	--	--	0	0	1	0
7 - 8	0	0	0	0	--	--	--	0	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	0.01	0.02	0.01	0.02	0.10	0.16	0.08	0.09	0.05	0.14	0.04

YEAR 4 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-21 FAST

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	0	--	0	0	0	0
5 - 6	0	0	0	0	0	0	--	0	0	0	0
6 - 7	0	0	0	0	0	--	--	0	0	1	0
7 - 8	0	0	0	0	--	--	--	0	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 5 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-21 FAST

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	0	--	0	0	0	0
5 - 6	0	0	0	0	0	0	--	0	0	0	0
6 - 7	0	0	0	0	0	--	--	0	0	0	0
7 - 8	0	0	0	0	--	--	--	0	--	0	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	0.00	0.01	0.00	0.01	0.06	0.11	0.05	0.06	0.04	0.09	0.02

YEAR 5 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-21 FAST

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	0	--	0	0	0	0
5 - 6	0	0	0	0	0	0	--	0	0	0	0
6 - 7	0	0	0	0	0	--	--	0	0	0	0
7 - 8	0	0	0	0	--	--	--	0	--	0	0
8 - 9	0	0	0	--	--	--	--	--	--	0	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

APPENDIX E

Year 1-5 Summary Org-TSS Concentrations: Peat Sample TSS-22 Settling Profile

YEAR 1 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-22

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	2	4	2	1	3	1	0
1 - 2	0	0	0	1	3	7	4	1	4	2	1
2 - 3	0	1	0	1	4	10	6	1	6	3	1
3 - 4	0	1	0	1	6	13	7	2	8	4	1
4 - 5	0	1	0	1	7	17	--	2	10	5	2
5 - 6	0	1	0	2	8	20	--	3	12	5	2
6 - 7	0	1	0	2	10	--	--	3	14	6	2
7 - 8	1	1	0	2	--	--	--	4	--	7	2
8 - 9	1	2	0	--	--	--	--	--	--	8	3
9 - 10	1	2	0	--	--	--	--	--	--	--	--
avg depth	8.5	6.4	7.5	3.9	2.5	1.5	1.9	3.1	2.1	2.6	3.4
Hourly New Org-TSS (mg/L)	**0.07**	**0.17**	**0.03**	**0.26**	**1.41**	**3.39**	**1.84**	**0.45**	**2.01**	**0.92**	**0.31**

YEAR 1 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-22

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	1	1	0	1	0	0
1 - 2	0	0	0	0	1	3	2	0	2	1	0
2 - 3	0	0	0	1	3	7	4	1	4	2	1
3 - 4	0	1	0	1	4	10	5	1	6	3	1
4 - 5	0	1	0	1	6	13	--	2	8	4	1
5 - 6	0	1	0	1	7	17	--	2	10	5	2
6 - 7	0	1	0	2	8	--	--	3	12	5	2
7 - 8	0	1	0	2	--	--	--	3	--	6	2
8 - 9	1	1	0	--	--	--	--	--	--	7	2
9 - 10	1	2	0	--	--	--	--	--	--	--	--

YEAR 2 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-22

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	1	0	0	0	1	0
1 - 2	0	0	0	0	1	1	1	1	0	1	0
2 - 3	0	0	0	0	1	2	1	1	1	1	0
3 - 4	0	0	0	0	1	2	1	1	1	2	0
4 - 5	0	0	0	0	2	3	--	1	1	2	1
5 - 6	0	0	0	0	2	3	--	2	1	3	1
6 - 7	0	0	0	0	2	--	--	2	1	3	1
7 - 8	0	1	0	0	--	--	--	2	--	4	1
8 - 9	0	1	0	--	--	--	--	--	--	4	1
9 - 10	0	1	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	**0.02**	**0.07**	**0.02**	**0.06**	**0.32**	**0.53**	**0.27**	**0.30**	**0.18**	**0.45**	**0.12**

YEAR 2 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-22

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	1	0	0	0	0	0
2 - 3	0	0	0	0	1	1	1	1	0	1	0
3 - 4	0	0	0	0	1	2	1	1	1	1	0
4 - 5	0	0	0	0	1	2	--	1	1	2	0
5 - 6	0	0	0	0	2	3	--	1	1	2	1
6 - 7	0	0	0	0	2	--	--	2	1	3	1
7 - 8	0	0	0	0	--	--	--	2	--	3	1
8 - 9	0	1	0	--	--	--	--	--	--	4	1
9 - 10	0	1	0	--	--	--	--	--	--	--	--

YEAR 3 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-22

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	1	0	0	0	0	0
2 - 3	0	0	0	0	0	1	0	0	0	1	0
3 - 4	0	0	0	0	1	1	1	1	0	1	0
4 - 5	0	0	0	0	1	1	--	1	0	1	0
5 - 6	0	0	0	0	1	2	--	1	1	1	0
6 - 7	0	0	0	0	1	--	--	1	1	2	0
7 - 8	0	0	0	0	--	--	--	1	--	2	0
8 - 9	0	0	0	--	--	--	--	--	--	2	1
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	**0.01**	**0.04**	**0.01**	**0.03**	**0.16**	**0.26**	**0.14**	**0.15**	**0.09**	**0.23**	**0.06**

YEAR 3 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-22

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	1	0	0	0	0	0
3 - 4	0	0	0	0	0	1	0	0	0	1	0
4 - 5	0	0	0	0	1	1	--	1	0	1	0
5 - 6	0	0	0	0	1	1	--	1	0	1	0
6 - 7	0	0	0	0	1	--	--	1	1	1	0
7 - 8	0	0	0	0	--	--	--	1	--	2	0
8 - 9	0	0	0	--	--	--	--	--	--	2	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 4 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-22

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	1	0	0	0	1	0
4 - 5	0	0	0	0	0	1	--	0	0	1	0
5 - 6	0	0	0	0	1	1	--	1	0	1	0
6 - 7	0	0	0	0	1	--	--	1	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	**0.01**	**0.02**	**0.01**	**0.02**	**0.10**	**0.16**	**0.08**	**0.09**	**0.05**	**0.14**	**0.04**

YEAR 4 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-22

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	1	--	0	0	1	0
5 - 6	0	0	0	0	0	1	--	0	0	1	0
6 - 7	0	0	0	0	1	--	--	1	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 5 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-22

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	1	--	0	0	0	0
5 - 6	0	0	0	0	0	1	--	0	0	1	0
6 - 7	0	0	0	0	0	--	--	0	0	1	0
7 - 8	0	0	0	0	--	--	--	0	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	**0.00**	**0.01**	**0.00**	**0.01**	**0.06**	**0.11**	**0.05**	**0.06**	**0.04**	**0.09**	**0.02**

YEAR 5 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-22

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	0	--	0	0	0	0
5 - 6	0	0	0	0	0	1	--	0	0	0	0
6 - 7	0	0	0	0	0	--	--	0	0	1	0
7 - 8	0	0	0	0	--	--	--	0	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

APPENDIX F

Year 1-5 Summary Org-TSS Concentrations: Peat Sample TSS-23 Settling Profile

YEAR 1 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-23

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	2	4	2	1	2	1	0
1 - 2	0	0	0	0	2	5	3	1	3	1	0
2 - 3	0	0	0	1	3	8	4	1	5	2	1
3 - 4	0	1	0	1	4	10	5	1	6	3	1
4 - 5	0	1	0	1	5	12	--	2	7	3	1
5 - 6	0	1	0	1	6	15	--	2	9	4	1
6 - 7	0	1	0	1	7	--	--	2	10	5	2
7 - 8	0	1	0	1	--	--	--	3	--	5	2
8 - 9	0	1	0	--	--	--	--	--	--	6	2
9 - 10	0	1	0	--	--	--	--	--	--	--	--
avg depth	8.5	6.4	7.5	3.9	2.5	1.5	1.9	3.1	2.1	2.6	3.4
Hourly New Org-TSS (mg/L)	**0.07**	**0.17**	**0.03**	**0.26**	**1.41**	**3.39**	**1.84**	**0.45**	**2.01**	**0.92**	**0.31**

YEAR 1 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-23

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	1	0	0	0	0	0
1 - 2	0	0	0	0	1	2	1	0	1	1	0
2 - 3	0	0	0	0	2	4	2	1	3	1	0
3 - 4	0	0	0	1	3	7	4	1	4	2	1
4 - 5	0	0	0	1	4	9	--	1	5	2	1
5 - 6	0	1	0	1	5	11	--	2	7	3	1
6 - 7	0	1	0	1	6	--	--	2	8	4	1
7 - 8	0	1	0	1	--	--	--	2	--	4	1
8 - 9	0	1	0	--	--	--	--	--	--	5	2
9 - 10	0	1	0	--	--	--	--	--	--	--	--

YEAR 2 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-23

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	1	0	0	0	1	0
1 - 2	0	0	0	0	1	1	0	0	0	1	0
2 - 3	0	0	0	0	1	1	1	1	0	1	0
3 - 4	0	0	0	0	1	2	1	1	1	1	0
4 - 5	0	0	0	0	1	2	--	1	1	2	0
5 - 6	0	0	0	0	1	2	--	1	1	2	1
6 - 7	0	0	0	0	2	--	--	2	1	2	1
7 - 8	0	0	0	0	--	--	--	2	--	3	1
8 - 9	0	0	0	--	--	--	--	--	--	3	1
9 - 10	0	1	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	**0.02**	**0.07**	**0.02**	**0.06**	**0.32**	**0.53**	**0.27**	**0.30**	**0.18**	**0.45**	**0.12**

YEAR 2 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-23

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	1	0	0	0	1	0
3 - 4	0	0	0	0	1	1	1	1	0	1	0
4 - 5	0	0	0	0	1	1	--	1	0	1	0
5 - 6	0	0	0	0	1	2	--	1	1	2	0
6 - 7	0	0	0	0	1	--	--	1	1	2	0
7 - 8	0	0	0	0	--	--	--	1	--	2	1
8 - 9	0	0	0	--	--	--	--	--	--	2	1
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 3 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-23

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	1	0	0	0	1	0
3 - 4	0	0	0	0	0	1	0	0	0	1	0
4 - 5	0	0	0	0	1	1	--	1	0	1	0
5 - 6	0	0	0	0	1	1	--	1	0	1	0
6 - 7	0	0	0	0	1	--	--	1	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	0.01	0.04	0.01	0.03	0.16	0.26	0.14	0.15	0.09	0.23	0.06

YEAR 3 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-23

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	1	0	0	0	0	0
4 - 5	0	0	0	0	0	1	--	0	0	1	0
5 - 6	0	0	0	0	1	1	--	1	0	1	0
6 - 7	0	0	0	0	1	--	--	1	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 4 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-23

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	1	--	0	0	0	0
5 - 6	0	0	0	0	0	1	--	0	0	1	0
6 - 7	0	0	0	0	0	--	--	0	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	0.01	0.02	0.01	0.02	0.10	0.16	0.08	0.09	0.05	0.14	0.04

YEAR 4 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-23

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	0	--	0	0	0	0
5 - 6	0	0	0	0	0	1	--	0	0	0	0
6 - 7	0	0	0	0	0	--	--	0	0	1	0
7 - 8	0	0	0	0	--	--	--	0	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 5 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-23

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	0	--	0	0	0	0
5 - 6	0	0	0	0	0	0	--	0	0	0	0
6 - 7	0	0	0	0	0	--	--	0	0	0	0
7 - 8	0	0	0	0	--	--	--	0	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	0.00	0.01	0.00	0.01	0.06	0.11	0.05	0.06	0.04	0.09	0.02

YEAR 5 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-23

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	0	--	0	0	0	0
5 - 6	0	0	0	0	0	0	--	0	0	0	0
6 - 7	0	0	0	0	0	--	--	0	0	0	0
7 - 8	0	0	0	0	--	--	--	0	--	0	0
8 - 9	0	0	0	--	--	--	--	--	--	0	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

APPENDIX G

Year 1-5 Summary Org-TSS Concentrations: Peat Sample TSS-24 Settling Profile

YEAR 1 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-24

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	2	4	2	1	2	1	0
1 - 2	0	0	0	0	2	6	3	1	3	2	1
2 - 3	0	0	0	1	4	9	5	1	5	2	1
3 - 4	0	1	0	1	5	11	6	1	7	3	1
4 - 5	0	1	0	1	6	14	--	2	8	4	1
5 - 6	0	1	0	1	7	16	--	2	10	4	1
6 - 7	0	1	0	1	8	--	--	3	11	5	2
7 - 8	0	1	0	2	--	--	--	3	--	6	2
8 - 9	0	1	0	--	--	--	--	--	--	7	2
9 - 10	1	1	0	--	--	--	--	--	--	--	--
avg depth	8.5	6.4	7.5	3.9	2.5	1.5	1.9	3.1	2.1	2.6	3.4
Hourly New Org-TSS (mg/L)	**0.07**	**0.17**	**0.03**	**0.26**	**1.41**	**3.39**	**1.84**	**0.45**	**2.01**	**0.92**	**0.31**

YEAR 1 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-24

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	1	0	0	0	0	0
1 - 2	0	0	0	0	1	2	1	0	1	1	0
2 - 3	0	0	0	0	2	5	3	1	3	1	0
3 - 4	0	0	0	1	3	8	4	1	5	2	1
4 - 5	0	1	0	1	4	10	--	1	6	3	1
5 - 6	0	1	0	1	5	13	--	2	8	3	1
6 - 7	0	1	0	1	6	--	--	2	9	4	1
7 - 8	0	1	0	1	--	--	--	2	--	5	2
8 - 9	0	1	0	--	--	--	--	--	--	6	2
9 - 10	0	1	0	--	--	--	--	--	--	--	--

YEAR 2 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-24

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	1	0	0	0	1	0
1 - 2	0	0	0	0	1	1	0	1	0	1	0
2 - 3	0	0	0	0	1	1	1	1	0	1	0
3 - 4	0	0	0	0	1	2	1	1	1	1	0
4 - 5	0	0	0	0	1	2	--	1	1	2	0
5 - 6	0	0	0	0	2	3	--	1	1	2	1
6 - 7	0	0	0	0	2	--	--	2	1	3	1
7 - 8	0	0	0	0	--	--	--	2	--	3	1
8 - 9	0	1	0	--	--	--	--	--	--	3	1
9 - 10	0	1	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	**0.02**	**0.07**	**0.02**	**0.06**	**0.32**	**0.53**	**0.27**	**0.30**	**0.18**	**0.45**	**0.12**

YEAR 2 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-24

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	1	0	0	0	1	0
3 - 4	0	0	0	0	1	1	1	1	0	1	0
4 - 5	0	0	0	0	1	2	--	1	1	1	0
5 - 6	0	0	0	0	1	2	--	1	1	2	0
6 - 7	0	0	0	0	1	--	--	1	1	2	1
7 - 8	0	0	0	0	--	--	--	2	--	2	1
8 - 9	0	0	0	--	--	--	--	--	--	3	1
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 3 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-24

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	1	0	0	0	1	0
3 - 4	0	0	0	0	1	1	0	0	0	1	0
4 - 5	0	0	0	0	1	1	--	1	0	1	0
5 - 6	0	0	0	0	1	1	--	1	0	1	0
6 - 7	0	0	0	0	1	--	--	1	1	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	2	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	0.01	0.04	0.01	0.03	0.16	0.26	0.14	0.15	0.09	0.23	0.06

YEAR 3 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-24

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	1	0	0	0	1	0
4 - 5	0	0	0	0	0	1	--	0	0	1	0
5 - 6	0	0	0	0	1	1	--	1	0	1	0
6 - 7	0	0	0	0	1	--	--	1	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 4 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-24

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	1	0	0	0	0	0
4 - 5	0	0	0	0	0	1	--	0	0	1	0
5 - 6	0	0	0	0	0	1	--	0	0	1	0
6 - 7	0	0	0	0	1	--	--	1	0	1	0
7 - 8	0	0	0	0	--	--	--	1	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	0.01	0.02	0.01	0.02	0.10	0.16	0.08	0.09	0.05	0.14	0.04

YEAR 4 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-24

Total Depth (m)	Peat Transport Zone 1	2	3	5	7	8	9	10	11	12	13
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	0	--	0	0	0	0
5 - 6	0	0	0	0	0	1	--	0	0	1	0
6 - 7	0	0	0	0	0	--	--	0	0	1	0
7 - 8	0	0	0	0	--	--	--	0	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--

YEAR 5 Peak Org-TSS at Start of Hour (mg/L)

Peat Settling Distribution : TSS-24

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	0	--	0	0	0	0
5 - 6	0	0	0	0	0	1	--	0	0	0	0
6 - 7	0	0	0	0	0	--	--	0	0	1	0
7 - 8	0	0	0	0	--	--	--	0	--	1	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--
Hourly New Org-TSS (mg/L)	**0.00**	**0.01**	**0.00**	**0.01**	**0.06**	**0.11**	**0.05**	**0.06**	**0.04**	**0.09**	**0.02**

YEAR 5 Minimum Org-TSS at End of Hour (mg/L)

Peat Settling Distribution : TSS-24

	Peat Transport Zone										
Total Depth (m)	**1**	**2**	**3**	**5**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
0 - 1	0	0	0	0	0	0	0	0	0	0	0
1 - 2	0	0	0	0	0	0	0	0	0	0	0
2 - 3	0	0	0	0	0	0	0	0	0	0	0
3 - 4	0	0	0	0	0	0	0	0	0	0	0
4 - 5	0	0	0	0	0	0	--	0	0	0	0
5 - 6	0	0	0	0	0	0	--	0	0	0	0
6 - 7	0	0	0	0	0	--	--	0	0	0	0
7 - 8	0	0	0	0	--	--	--	0	--	0	0
8 - 9	0	0	0	--	--	--	--	--	--	1	0
9 - 10	0	0	0	--	--	--	--	--	--	--	--