HUDSON RIVER PCBs REASSESSMENT RI/FS
PHASE 3 REPORT: FEASIBILITY STUDY

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For

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Book 5 of 6
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TAMS Consultants, Inc.

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D.1 Use of Data Trends and Models in Evaluating Remedial Alternatives

Use of Data Trends and Models in Evaluating Remedial Alternatives

The evaluation of remedial alternatives for the Hudson River PCBs site utilized a number of analytical tools. The first and foremost among these tools are the quantitative models developed for the Reassessment RI/FS. The models predict water, sediment and fish PCB concentrations, and make it possible to compare remedial alternatives. However, the model predictions alone do not provide a complete basis for decision. The uncertainty associated with the predictions should also be taken into account. In addition to the models, it is also valuable to utilize a separate set of tools; the analysis of trends in the data.

The HUDTOX mass balance fate and transport model is the quantitative foundation for the Feasibility Study. HUDTOX provides a best-estimate interpretation of the 1977–97 history of observed PCB fate and transport in the Upper Hudson River, at a model segment-averaged spatial scale. FISHRAND similarly provides a best-estimate interpretation of the history of observed PCB concentrations in fish, conditional on the HUDTOX interpretation of PCB fate and transport. While these models are calibrated to provide best-estimate interpretations of data, the interpretations are not necessarily exact. First, the calibrated models are limited by the quality of available calibration data. In some key areas, the calibration data are limited (e.g., there are only very limited data on surface-layer sediment PCB concentrations over time). Second, the models cannot capture all the details of PCB fate and transport at the local scale at which the biota actually uptake PCBs from sediment and water.

The models are, of necessity, simplifications of reality. Coupled with the fact that calibration data are imperfect, this means that there is inevitable uncertainty associated with model forecasts. Further, deficiencies in the calibration data could result in a model that is biased—in the sense that causal relationships are not perfectly captured–which may result in inaccuracies when the model is used in a forecast mode. Bias might also be introduced if there has been a qualitative change in the nature of PCB fate and transport in the river relative to the model calibration period. Finally, the model has been built and calibrated at the scale of model segments and river reaches. These relatively broad spatial scales do not necessarily reflect what happens at local spatial scales smaller than model segments. All of these considerations suggest that model predictions alone do not provide sufficient and complete evidence on which to evaluate remedial alternatives.

Potential uncertainty and bias in the models are of particular importance for evaluating the No Action and Monitored Natural Attenuation alternatives, as the interpretation of risks associated with these alternatives relies on model predictions that a certain fraction of the mass of PCBs in river sediments will remain isolated from the food chain in the river. Forecasts associated with significant removal or capping of contaminated sediments have relatively less uncertainty, at least in terms of long-term impact, as the isolation from the river of a portion of the PCBs is assured by the remedial action.

This Appendix discusses a variety of analytical tools that address the fate and transport (and availability for bioaccumulation) of PCBs in the Hudson, including, but not limited to the quantitative models. The first section summarizes the quantitative fate and transport and bioaccumulation models. The second section provides an analysis of trends in recent data. This has two purposes: First, the trend analysis provides a purely data-based, empirical estimate of the potential future status of the river given No Action. Second, comparison of trends in data and the models helps provide insight into the potential uncertainty and/or bias associated with model forecasts. The next three sections provide tools that relate to interpretation of modeling results, addressing model uncertainty, potential model bias, and model scale issues. The sixth and final section documents the development of an alternative, bounding calculation of the No Action and Monitored Natural Attenuation alternatives.

1. Quantitative Models

The primary criterion for screening the effectiveness of a remedial alternative is its ability to protect human health and the environment. Evaluation of this criterion is based on forecasts of exposure concentrations and resulting risks associated with each remedial alternative. Quantitative models aid in the evaluation of this criterion; however, the forecasts should be evaluated using a weight-of-evidence approach.

Quantitative modeling forecasts are provided by a series of coupled mathematical models, developed to aid understanding of PCB fate and transport and PCB bioaccumulation in the Upper Hudson River. The backbone of the modeling effort is the Upper Hudson River Toxic Chemical Model (HUDTOX). HUDTOX is a modified version of USEPA's widely-used WASP5 model, and was used to simulate PCB fate and transport for the 40 miles of the Upper Hudson River from Fort Edward to the Federal Dam at Troy, New York. This model is based on the principle of conservation of mass, and balances inputs, outputs, and internal sources and sinks for PCBs in the sediments and the water column. Mass balances are constructed first for water, then solids and bottom sediment, and finally PCBs.

HUDTOX is augmented by a hydraulic model of the Thompson Island Pool, a sediment scour model, and a bioaccumulation model. Hydrodynamic behavior of the Thompson Island Pool was simulated with the US Army Corps of Engineers RMA-2V model, which estimates velocities and shear stresses on a two-dimensional grid. The Depth of Scour Model (DOSM) was principally developed to provide spatially-refined information on sediment erosion depths in response to high-flow events such as a 100-year peak flow. DOSM is linked with a hydrodynamic model that predicts the velocity and shear stress (force of the water acting on the sediment surface) during high flows. DOSM results are also fed forward into HUDTOX through relationships that represent area-average rates of flow-dependent resuspension of cohesive sediments for HUDTOX segments. Model calculations of forecast PCB concentrations in the water column and sediment from HUDTOX are used as inputs to the bioaccumulation model (FISHRAND) to predict PCB concentrations in the fish. These models are described in greater detail in the Revised Baseline Modeling Report (USEPA, 2000a).

As constructed and calibrated, the mass balance modeling shows the following key characteristics over the 70-year forecast period:

- The river is net depositional in the TI Pool (River Section 1), and apparently also in the downstream sections (River Sections 2 and 3).

- Solids loads are dominated by the tributary inputs (downstream of the TI Pool). Assumptions regarding solids loads exert an important control on long-term predictions of the environmental distribution and availability of PCBs to the food chain.

- PCB (Tri+) loads to the water column are dominated by the sediment to water mass transfer under non-scouring flow conditions. In recent years (post 1993), water column and PCB (Tri+) surface sediment concentrations are gradually declining due to reduced input loads from the GE facilities and natural attenuation processes.

- For the first two to three decades of the model forecast, depending on location, the in-place PCB (Tri+) reservoir in the sediments and sediment-water transfer processes control responses of surface sediment concentrations and associated flux to the water column.

- Reach-averaged PCB (Tri+) concentrations in the surface sediment are forecast to decline at annual rates of approximately seven to nine percent over the next two decades, consistent with long-term historical trends.

- PCB (Tri+) loads from upstream of the model boundary at Fort Edward control the long-term responses of reach-average PCB (Tri+) concentrations in the water column and surface sediments, and accordingly, reach-averaged exposures to fish. Sediment-derived PCB exposure to fish at the local scale may, however, differ significantly from reach-average forecasts.

- The rate at which reach-averaged exposure concentrations approach an asymptote depends upon the assumed magnitude of the upstream boundary load and location within the river.

- Over the long term, PCB (Tri+) fish body burdens will also asymptotically approach steady-state concentrations. These concentrations are species-specific, depending on the relative influence of sediment versus water sources, and reflect the upstream boundary loading assumption.

When applied in a forecast mode, the models suggest that active remediation of sediments can have a significant benefit in reducing exposure concentrations and fish body burdens of PCBs. The models also suggest that the relative risk reduction associated with sediment remediation may only last for several decades relative to No Action and Monitored Natural Attenuation (MNA). This results primarily from model predictions of relatively rapid reductions in exposure due to natural processes. (Note: Natural processes that reduce PCB exposures occur in both the No Action and the Monitored Natural Attenuation alternatives; the primary difference between these alternatives for the purposes of this Appendix is that the No Action alternative does not assume upstream source control, whereas the Monitored Natural Attenuation alternative does.)

Active remediation scenarios are distinguished from No Action and MNA by accomplishing a step function movement (representing remediation) rather than gradual decline toward asymptotic sediment concentrations in equilibrium with the upstream boundary concentration. The apparent benefits of remediation (as compared to No Action or MNA) are constrained by the trajectory of the No Action or MNA alternatives. The No Action and MNA trajectory is controlled by the model assumptions that represent “natural” attenuation.

The ability of the model to distinguish among remedial scenarios and to contrast remediation against the No Action and Monitored Natural Attenuation alternatives depends on the accuracy of the model calibration and the model’s spatial segmentation. These issues are discussed in detail in subsequent sections of this Appendix. Uncertainties associated with model calibration and spatial segmentation, as well as an empirical analysis of recent data-based trends, raise the distinct possibility of a slower rate of decline in exposure concentrations than predicted by the HUDTOX model, particularly at the localized spatial scales associated with the foraging range of resident fish. This would result in underestimation of the benefits of active remediation.

2. Analysis of Trends

The analysis of trends was developed as a secondary line of evidence for use in conjunction with the quantitative models. The analysis compares the time course of predicted and observed PCB concentrations and loads in various media, with particular attention to apparent half-lives. Half-lives are not an ideal metric for evaluating the general quality of model fit, as small changes in model parameters can lead to large changes in apparent half-lives without having a large effect on the quality of fit to observed data. For the Hudson River Reassessment RI/FS, however, the time required to reach a specific concentration target is an important factor in the evaluation of remedial alternatives. Therefore, half-lives provide an important diagnostic for the decision support uses of the HUDTOX model.

Many of the PCB trends in the Hudson River resemble exponential declines, albeit trends that have been interrupted or reset at various times (e.g., the increased upstream loading following the Allen Mill gate structure failure in Fall 1991). An exponential decline may be characterized by a half-life, or the time required for a metric to reach one-half of its starting value. If the model accounts for the mechanisms controlling the system correctly, half-lives predicted by the model should match those seen in observations.

PCB trends in the Hudson since the start of monitoring are not well characterized as a *single, consistent* exponential decline. Most notably, conditions were partially reset in 1991 by the Allen Mill gate structure failure at Hudson Falls, and other perturbations probably have occurred, including those associated with unusual hydrology (e.g., high flow events). Further, it is reasonable to guess that rates of decline may have changed over time, as the contaminated sediment released by the Fort Edward Dam removal washed out or stabilized and as the relative importance of different physical processes changed. Therefore, the available time series are broken into subsets to capture these potential changes in trend. The following time spans were selected as the primary basis for comparison:

1977 - 1985	(early period of decline following the Fort Edward Dam removal)
1985 - Sept. 1991	(subsequent period of decline up to the Allen Mill event)
1985 - 1999	(net trend for the past 15 years)
1995 - 1999	(period after the stabilization of the Hudson Falls source)

The breakpoints among these time intervals appear to capture the major potential changes in trend.
The time periods of 1999-2004 and 1999-2020 were examined to evaluate the consistency of model forecasts with recent data. Forecasts for the No Action alternative were evaluated under an assumed constant load upstream boundary concentration condition. A consequence of the assumption of constant upstream loads in the forecast is that all half-lives will gradually increase as concentrations in the various media gradually approach equilibrium with the upstream boundary.

2.1 PCB Concentration Trends in Fish

Concentration trends in fish potentially provide one of the most rigorous tests of the joint performance of HUDTOX and FISHRAND, as the fish response integrates many geochemical processes. Long time series of concentrations in various species at various locations are available from NYSDEC, and these biotic concentrations should integrate or smooth out short term or spatial variability seen in other media. Several caveats should, however, be noted. Most importantly, changes in analytical methods over time may serve to introduce spurious step changes into the fish concentration record. This problem is reduced by attempts to convert the NYSDEC data to a consistent Tri+ PCB basis, although the conversions themselves are subject to uncertainty. In addition, concentrations in fish in a given year may be influenced by factors such as weather, food availability, and the distribution of age and sex in a given year's data set.

It is also important to remember that calibration of the FISHRAND model was conducted using environmental concentration estimates from HUDTOX as the forcing function. Thus, any shortcomings in HUDTOX will also propagate into the FISHRAND calibration. Trends in brown bullhead should generally follow HUDTOX predicted trends in surface sediment concentration, while trends in pumpkinseed should generally follow predicted trends in water column concentration (particularly summer concentrations), and largemouth bass should depend on both sediment and water (see Table 6-7 in the RBMR, USEPA, 2000a).

Concentration trends in fish are evaluated here as lipid-based concentrations, on the assumption that conversion to a lipid basis better reflects actual uptake processes and helps to smooth out some of the year-to-year and sample-to-sample variability. A comparison of FISHRAND model median predictions to observed (corrected) Tri+ PCB data in fish lipid is shown for three species in the lower Thompson Island Pool and the Stillwater reach in Figures 1 and 2. These results use actual (observed) upstream boundary conditions for the 1998–99 validation period.

Figure 1 shows results for fish collected by NYSDEC near Griffin Island at RM 189 in the TI Pool. While the general fit seems acceptable, there are some discrepancies between model and data. For the largemouth bass, the model appears to underpredict recent 1998 and 1999 concentrations. High concentrations observed in

1990–91 are also not predicted by the model.

For brown bullhead, the general model trend in the TI Pool appears to fit better than for largemouth bass. It is noted, however, that the model predicts a gradual decreasing trend from 1995–1999, while the data show what appear to be nearly constant concentrations, with a slight increase in 1999. Given the dependence of bullhead concentrations on surface sediment, this result suggests that the modeled trend in surface sediment concentrations for this period might differ from the trend in sediment-driven exposure experienced by the sampled fish. This could occur either because the modeled trend is incorrect or because the exposure to the fish occurs at a local spatial scale that is smaller than that simulated by the model in which sediment concentration trends differ from the reach-averaged trend. Alternative explanations are that FISHRAND itself does not provide a valid translation from exposure concentrations to fish body burdens for the environmental conditions present in the late 1990's, or that the trend in the observed fish data is obscured by random variability in the sample results.

Pumpkinseed body burdens should provide a diagnostic of model ability to reproduce summer water column concentration trends. For pumpkinseed, the general trend in TI Pool is fit by the model (although 1999 data are not yet available). Notable here is the failure to predict elevated concentrations in 1989 – which could in turn be a source of the elevated concentrations seen in largemouth bass in 1990 and 1991. The year 1989 is one in which the data to characterize the upstream boundary loads are very sparse, so this could indicate a failure to capture pulse loading from upstream and consequent underestimation of summer water column concentrations.

The 1995–1999 data from the Thompson Island Pool suggest that the models could be predicting a rate of decline in fish tissue concentration that is more rapid than seen in the environment for the period since the upstream source was largely controlled. Small changes in trend at this end of the distribution could have large effects on the rate of natural decline during the forecast period. The interpretation of the Thompson Island Pool results must be made with caution, however, due to the locations used for sampling. The fall samples of yearling pumpkinseed are generally collected on the east side of the main channel, opposite Griffin Island and just south of *Hot Spot* 14. The spring samples of largemouth bass and brown bullhead are, however, collected in the backwater channel *behind* Griffin Island (because this is an area in which the bass congregate in the spring). Because this channel is somewhat isolated from the main river, the relevance of trends in these data to overall conditions in the lower Thompson Island Pool is uncertain.

The model and data for the Stillwater reach (Figure 2) are generally in closer agreement for brown bullhead and largemouth bass in the 1990's relative to the TI Pool. The pumpkinseed calibration misses the error bars on observed lipid-based concentrations in most years up through 1993, which could indicate a failure to accurately represent summer water column concentrations in HUDTOX. More notable at this location is a divergence between model and observations between 1977 and 1982. For all three species, the data suggest that initial concentrations were higher, with a more rapid decline, than is indicated by the FISHRAND model. For this period, the data to constrain water column concentrations in the modeling are very sparse. There are also significant uncertainties regarding the interpretation of analytical methods for the earlier data.

Table 1 summarizes half-life data for the three species discussed above, plus yellow perch. The consistent Tri+ data includes both Aroclor-based data reported by NYSDEC and direct estimates of Tri+ from homologue-based analyses from NEA included in the NYSDEC database. In addition to the model and consistent PCB Tri+ data, the table also includes the trends from annual means of NYSDEC-reported lipid-based total PCBs (NYSDEC-collected data only) and Aroclor 1254 concentrations without correction to a consistent Tri+ basis. These data are included for comparison; however, it is believed that analytical changes in 1990 and ca. 1992 may distort the interpretation of trends.

Across the period 1985-1999, trends in model and data (consistent Tri+ PCBs) are generally quite close. This reflects the fact that FISHRAND is calibrated to data that span this period, and the general fit of the model is quite good. For the 1985-91 period of declining concentrations, model and data are again close in the Stillwater reach; however, the data-based trends in the TI Pool show both largemouth bass and pumpkinseed increasing, whereas the model predicts declines.

In general, the model does a good job of reproducing observed fish concentrations over the period of record when examined as an annualized lipid-based average concentration. But, the model does not seem to reproduce the trend in observed concentrations since 1995. For the recent 1995-99 period following substantial control of the upstream source the trends in the model and data appear to diverge. In the TI Pool, the model predicts continuing steady declines in fish concentration, but the data show either increasing or very slowly decreasing concentrations. For brown bullhead, the 1995-99 data-based half-life is 50 years versus a model estimate of 8.73 years, while largemouth bass have an increasing trend versus a model estimated half-life of 4.10 years. The rate of decline in the Stillwater reach also appears to be over-predicted for brown bullhead and largemouth bass.

In evaluating these trends it is important to keep in mind that the observed data are variable and subject to uncertainty. Reported trends are based on annual means. The 95-percent confidence limits on the observed means for 1995-99 are consistent with half-lives as short as 4.1 years for brown bullhead and as short as 6.7 years for largemouth bass. The FISHRAND output provides 1995-99 half-lives that are outside (shorter than) the range for largemouth bass, suggesting that a discrepancy is present—but the magnitude of this discrepancy could well be small. For brown bullhead, the central-tendency best estimates of trend appear quite different between model and data, but the range about the bullhead data covers the modeled trend for this period.

2.2 Water Column Load and Concentration

Long time series also exist for PCB concentrations in water. Interpretation of these data is uncertain, however, for years before 1991, due to the presence of sparse data and high temporal variability. The situation is better after 1991 due to the presence of GE monitoring, although a high degree of measurement-to-measurement variability is still present. The analyses presented here combine the USGS and GE results, where available, after conversion to a consistent Tri+ PCBs basis.

The water column data may be examined in terms of both loads and concentrations. Loads, as a more integrative measure, are examined first. Ratio estimators are used to convert from concentration and flow to continuous loads, as described in the DEIR.

Figure 3 compares annual Tri+ loads calculated from the concentration and flow output of the HUDTOX model with loads estimated from USGS monitoring data at Fort Edward and Waterford, approximately representing the upstream and downstream ends of the HUDTOX model grid.

At Fort Edward, the model representation of the upstream boundary condition seems to be biased low for 1985 through 1995 relative to the ratio estimator. This likely reflects the fact that the boundary condition was interpolated between observed data points for entry into the model, which can potentially bias estimates of load.

At Waterford, a result opposite to that at Fort Edward is seen: the model predictions seem to decline more slowly than loads calculated from observed data, and appear to *over*-predict loads past Waterford after 1985.
Based on this comparison, if the model underestimates the upstream boundary load and over-estimates the downstream load exiting the system, then the model must predict too much removal of PCBs (or not enough storage of PCBs) in the intervening reaches. This could in turn result in an over-estimate of the rate of depletion of PCBs in surface sediments.

Table 2 summarizes model-estimated half-lives for PCB Tri+ annual load between 1985 and 2020. Half-lives appear relatively long for the 1985–1990 period, but this is due to hydrologically-driven load increases in 1990; half-lives for 1985-1999 are much shorter. Half-lives after 1999 increase as the load asymptotes toward the assumed constant load upstream boundary specification.

Only limited data are available against which to compare recent load predictions. The best concentration data are those for the Thompson Island Dam, collected by GE since 1991. For the 1995-1999 period, loads calculated directly from these data show a half-life of 46 years, because the 1995 estimate is relatively low, versus a model estimate of 9.1 years. For 1994-1999 the data-based estimate is 10.0 years, while the model estimate is 5.9 years. While these results suggest a discrepancy, the data-based loads are calculated from concentrations at the TID-West nearshore station. Concentrations at this station are believed to be biased high relative to the average transport in the river during low flow conditions with reduced lateral mixing. This could result in an apparent discrepancy in load half-lives as the importance of TI Pool sediment-generated PCB loads has increased relative to the upstream load. Insufficient data are available from center channel observations at Thompson Island Dam, however, to estimate load trends over time.

At Waterford, loads calculated from USGS data provide estimated half-lives of 7.4 years for 1985–1990 and 1.8 years for 1985–1989, both shorter than the model estimates. As with the fish data, the estimated half-lives are subject to considerable uncertainty. Figure 4 provides a detail of Tri+ loads at the USGS Stillwater station (now discontinued). As at Waterford, the HUDTOX model appears to over-predict PCB loads at this station, and the actual loads appear to have declined faster than predicted by the model. It is possible that the USGS data may have a consistent bias relative to GE data as estimators of Tri+; however, this should not effect the estimation of trends.

Model and data may also be compared on a concentration basis. Figure 7-20 in the RBMR suggests that HUDTOX predicts more stable water column concentrations, with a slower rate of decline from peak concentration years than is seen in the data for stations downstream of TI Dam. This is supported by a half-life analysis. Results are similar for annual average and summer water column concentrations.

Figure 5 shows water column results on an annual average concentration basis – *i.e.*, a direct, non flow-weighted average concentration. The model upstream boundary condition and Fort Edward data agree quite well, as expected, as the boundary condition is specified by interpolating on the observed data. At Stillwater and Waterford, however, the model predictions are flatter than observations, and the model appears to over-estimate concentrations from about 1984 to 1996.

Table 3 summarizes half-lives for Tri+ PCB in the HUDTOX model output, using observed validation data for 1998-1999 upstream concentrations and the constant load boundary condition for the forecast period. Both annual average and summer average (May-September) results are shown; in general, the summer average concentrations have a slightly shorter half-life than the annual results. Recent data for comparison are again limited; however, the half-lives for 1995-1999 in the GE TID-West monitoring are 23.1 years for annual average and 17.3 years for summer average concentrations. These rates of decline are much slower than those attributed by the model for this period; however, the model quickly jumps to a longer half-life during the early forecast period due to the imposition of the constant load upstream boundary condition, which is forecast to account for two-thirds of the concentration present at Thompson Island Dam by 2005.

Despite some apparent discrepancies between short-term trends in model and data, by the end of the calibration period the model and data converge to similar concentration values. The No Action forecast then imposes a slow decline (long half-life) on future water column concentrations. As a result, model forecasts of water column concentrations are unlikely to result in a low bias in future exposure concentrations at the reach-averaged scale. Localized areas of elevated water concentrations in the neighborhood of exposed *hot spots* are not, however, represented at the larger spatial scale in the HUDTOX model.

2.3 Surface Sediment Data

Concentrations of PCBs in biota are driven by a combination of water column and surface sediment PCB concentrations. The relative importance of sediment-driven pathways varies by species, and, among the species studied, should be most important for brown bullhead.

Unfortunately, it is very difficult to evaluate concentration trends in surface sediment from the data, for three reasons:

1. Sediment PCB data have been collected at only a few points in time,
2. Concentrations in sediment are known to exhibit a high degree of spatial variability, which introduces a high level of uncertainty in any comparison across time based on limited sampling,
3. Much of the available sediment sampling has used rather large vertical segmentation, which makes it difficult or impossible to estimate data-based trends in concentration in the upper few centimeters of sediment that are likely to have the greatest influence on concentrations in biota.

Reach-averaged means of observed sediment concentrations provided the key calibration targets for the HUDTOX model, as described in the RBMR (USEPA, 2000a). In general, the model appears to do a fairly good job of starting with the 1976/78 sediment conditions and predicting forward through 1984 NYSDEC samples in the TI Pool, 1991 GE samples for the Upper Hudson, and 1998 GE samples for the Thompson Island Pool, when summarized at a reach-averaged scale. This is accompanied by a reasonable fit between modeled and apparent observed half-lives for sediment; however, the observed half-lives are highly uncertain. But, neither the 1976/78 or 1984 NYSDEC samples provide sufficient vertical resolution to identify PCB concentrations in the top few centimeters of sediment, so the model has not really been constrained to reproduce trends in the layer of sediment most likely to support bioaccumulation.

HUDTOX model predictions of the half-life of Tri+ PCB concentrations in the surface sediment layer are shown for selected locations in Table 4 (for HUDTOX runs that incorporate the observed upstream boundary conditions for 1998 and use a reinitialization to observed sediment concentrations in 1991.) Results are presented for averages across the TI Pool and three locations corresponding to the averaged model segments used to drive the FISHRAND model.

For cohesive sediments near the TI Dam and non-cohesive sediments above Federal Dam, half-lives for surface sediment concentration predicted by HUDTOX are relatively consistent over time, but appear to have been "reset" to longer values during the 1991-1993 time period due to model-predicted additions of PCB mass from increased upstream water-column loads. Significant addition of PCB mass to the surface sediments has *not* been confirmed by direct sediment sampling (discussed more below). Half-lives for the near-term forecast period are consistent with those seen prior to 1990, but shorter than those estimated by the model for 1995-1999. The model thus predicts that the rate of decline in surface sediment concentrations will increase over the next few years as the effects of the Allen Mill event wash out of the system. While this interpretation is not unreasonable, neither is it certain.

The ability of the model to reflect surface sediment concentration trends can be tested to some extent by comparing the 1991 GE sediment survey data (collected prior to the Allen Mill event) with more limited GE data for 1998. Unfortunately, the method of compositing used by GE in 1991 makes it difficult to exactly match samples between 1991 and 1998. It appears, however, that 1998 broad scale sampling at nine locations within the TI Pool and fine scale sample groups at two locations below Thompson Island Dam can be reasonably matched to 1991 composites. The comparison is shown in Table 5.

Of the eleven approximately co-located composite samples, average concentrations in the top 5 cm appear to have declined at eight locations between 1991 and 1998. Within the TI Pool, observed changes in surface sediment concentration between 1991 and 1998 range from -61.6% to +82.0%, suggesting a significant amount of local variability. The median change in the Tri+ PCB concentration in the top 5 cm of cohesive sediments in the TI Pool over this seven year period is approximately -33%. This equates to a 12.1-year half-life, or about a 40 percent greater halving time than is predicted by the HUDTOX model, which estimates that surface concentration (as a pool-wide average) should have declined by 43% in cohesive sediments and 42% in non-cohesive sediments between 1991 and 1998. The available samples for comparison are few, however, and difficult to generalize to a reach basis. Observed decline at several locations does closely approximate the rate of decline predicted by the model.

Statistical tests may be applied to these data under the assumption that sediment concentration should decline along according to an exponential trend. Given this assumption, the differences between 1991 and 1998 samples should be scale independent when expressed on a logarithmic scale. The 95-percent confidence limits on the average 7-year change in surface sediment concentrations range from a decline of 60 percent (5.3 year half life) to an increase of 1.3 %. Application of a two-tailed paired t-test to the natural logarithms of all 9 data points from the Thompson Island Pool does not reject the null hypothesis that the decline between 1991 to 1998 is equal to zero at the 95% significance level. Application of a stronger, one-tailed paired t-test, however, does result in a rejection of the null hypothesis that no decline has occurred at the 95% significance level. In other words, the data support a conclusion that a net decline in surface sediment concentration has occurred between 1991 and 1998, but the magnitude of this decline is subject to considerable uncertainty. When the same one-tailed test is applied to the smaller data set from cohesive sediments (7 observations; “fine” and “mixed” samples), the null hypothesis cannot be rejected at the 95% significance level. In other words, the data do not prove a significant decline in cohesive sediment surface concentrations between 1991 and 1998. But, neither are they incompatible with the model-estimated average rate of decline of 43 percent.

In fact, it is likely that cohesive sediments in the TI Pool have, on average, experienced some decline in surface concentrations between 1991 and 1998, but one that varies by location. Of particular interest are the results from *hot spot* 14, where only a small decline of 9.5% is estimated. This is one of the areas of the TI Pool that has the highest surface concentrations, and where little burial appears to be occurring. It is also near the NYSDEC fish sampling location. The estimated percent decline in surface sediment concentrations at *hot spot* 14 is almost identical to the decline associated with a 50-year half-life over a 7-year period (9.2%), which is the half-life estimated for recent (1995–1999) brown bullhead concentrations in the lower Thompson Island Pool. While these fish were not collected directly at *hot spot* 14, they could well be exposed to surface sediment concentrations that are declining at a similar, slow rate.

There is thus a possibility that the model may overestimate the rate of recent declines in surface layer sediment PCB concentrations. In addition, pool-wide trends may not be applicable at the smaller spatial scale at which fish feed. Further, it is likely that some PCBs from depths greater than 5 cm (*e.g.*, up to 10 cm depth) are mobilized into the food chain by benthic burrowers. While the HUDTOX model simulates vertical mixing of the sediment down to 10 cm depth in cohesive sediments, only the top 5 cm are subsequently utilized by the FISHRAND model. The deeper sediments below 5 cm are likely to show even slower rates of decline as they cannot readily exchange PCBs with the water column. Unfortunately, the GE broad-scale sampling in 1998 did not extend below 5 cm.

If the model over-estimates the rate of decline of bioavailable sediment PCB concentrations, this would in turn have important implications for the prediction of fish concentrations in those species with a significant benthic food chain pathway (*e.g.*, brown bullhead and largemouth bass). Indeed, the observation that concentrations in brown bullhead appear to have declined only slowly, if at all, since 1995 supports the possibility that the rates of decline of sediment exposure concentrations predicted by the model may be too fast, at least in the sediment forage areas associated with the NYSDEC fish sampling locations.

2.4 Summary of Trend Analysis

Observed trends and apparent half-lives in recent data provide useful diagnostic tools for examining potential model performance relative to the forecast period. The interpretation of trends is, however, complicated by a number of factors, including the Allen Mill gate failure event, normal year-to-year variability in flow patterns, and limited and uncertain data. For these reasons, it is not advisable to forecast future conditions based solely on recent trends. The examination of trends can, however, be used to aid in constructing a bounding calculation with the models.

The HUDTOX model has been demonstrated to provide an excellent fit to PCB concentrations in the water column at the reach scale, and the trend analysis does not suggest any major concerns with this component of the model. On the other hand, the data to constrain model predictions of surface and near-surface bioavailable PCB concentrations are quite limited. The trend analysis suggests the possibility that the model-predicted rate of decline of surface sediment Tri+ concentration in locations associated with NYSDEC fish sample collection, and, as a result, the rate of decline of fish concentrations driven by sediment exposures, may be too fast. The discrepancy is most likely due to cohesive sediments, as these sediments provide the main route of exposure to fish. This in turn suggests that a bounding forecast for No Action should be constructed using a slower rate of decline in cohesive sediment concentrations. The construction of such a bounding forecast is addressed in Section 5.

3. Model Uncertainty

The HUDTOX model was developed to estimate the future levels of PCBs in the sediments and water of the Upper Hudson. The model and its output are based on various analyses of the data that are used in turn to estimate the calibration targets that the model must satisfy. The HUDTOX model represents a credible best estimate of the processes controlling PCB dynamics in the Hudson River, given the availability of calibration data. Similarly, model predictions are the best estimates available consistent with the assumptions of the model calibration. It is important to note that the model forecasts are based on the model calibration and a range of assumed forcing functions (*e.g.,* boundary conditions). As a result, no conservative safety factors are incorporated into the forecasts. Use of the model predictions in evaluating remedial alternatives, however, should recognize the uncertainties in the predictions, thereby resulting in a remedial action that provides reasonable assurances of meeting risk targets. Of particular importance in this regard is evaluation of the possibility that the model predictions may overestimate the benefits of natural attenuation in the system. This may result in a more favorable comparison of No Action or MNA to active remedies than is warranted, when, in fact, it may not yield acceptable levels within an appropriate time frame.

As in any analysis of this magnitude, there are unavoidable uncertainties in the data and the related assumptions. In particular, there are several sources of model uncertainty that stem from lack of data or, more often, from the inability to directly measure the process represented in the model. Due to the complexity of the models, and the many potential sources of uncertainty, a single, quantitative estimate of the uncertainty in model predictions has not been produced. Rather, the RBMR (USEPA, 2000a) and subsequent evaluations (e.g., experimental modeling runs during development of the FS) include a variety of sensitivity analyses that measure the response of model predictions to changes in model parameters and forcing functions. In particular, Section 8.6 of the RBMR examines sensitivity of forecast results and concludes that the model forecasts are highly sensitive to specification of the upstream boundary PCB load, tributary solids loading, and vertical particle mixing. These sensitivity analyses provide a tool for considering the model uncertainties in the evaluation of remedial alternatives.

Small uncertainties in model calibration can have major ramifications in the evaluation of forecasts. For instance, the surface sediment data discussed in Section 1.3 of this Appendix have a median half-life of 12.1 years over the period 1991–1998, versus a HUDTOX estimate of about 8.6 years. The model estimate is well within the range of uncertainty on the observed data. With an exponential decay response, however, small changes in half life can produce a large change in time to reach a target. For example, to reach sediment exposure concentrations one-tenth of those now existing would require 28.6 years with an 8.6 year half life, but would take 40.2 years with a 12.1 year half life. Because the modeled rate of decline in exposure concentrations is uncertain, the models are more properly used to evaluate relative effects of different remedial options than to provide quantitative estimates of risk reduction based on time to reach a specific target, consistent with the recommendations of the Peer Review of the RBMR.

4. Potential Model Bias

The HUDTOX model represents a credible best estimate of the processes controlling PCB dynamics in the Hudson River, given the availability of calibration data. But, the possibility exists that the calibrated model is biased relative to future conditions in the Hudson River. Of particular importance is the possibility that the model predictions may over-estimate the benefits of natural attenuation in the system. Only a small degree of bias during the model hindcast period is sufficient to cause large variability in the estimated time to reach a specified remedial target, given the asymptotic character of model predictions. This section focuses on the potential for model calibration biases, and examines the following topics related to model behavior and supporting evidence:

1. Model calibration and the estimation of several sediment-water exchange parameters,

2. The apparent lack of recovery in summer water column conditions (despite the decline in the upstream loads originating from the Hudson Falls plant),

3. The lack of consistent decline in surface sediment conditions (again, despite the decline in the upstream loads originating from the Hudson Falls plant), and

4. Findings from the Low Resolution Sediment Coring Report, and sediment coring data collected by GE in 1999 that support the findings.

In the discussion that follows, it is important to note that the assumptions and parameters developed for the model are only as reliable as the available data. These data frequently provide the only numerical basis on which to estimate the model parameters. In many instances, circumstantial evidence suggests that these parameter estimates may be biased in one direction or another but do not provide a direct basis on which to numerically estimate an alternate parameter value. Thus the model will contain the best numerical value that can be obtained but circumstantial evidence suggests that the model output may be biased. The end result of the discussions that follow will indicate that, although the model forecast is within the range of uncertainty, it is likely that the forecast represents an optimistic rate of recovery for the Upper Hudson.

4.1 Model Calibration

The primary reason that model predictions of rates of natural attenuation are highly uncertain is the limited amount of temporal sediment calibration data available. The HUDTOX model uses reach-averaged concentrations in surficial cohesive and non-cohesive sediments as its main calibration target. Water column concentrations alone cannot constrain the calibration because they are highly variable and driven in large part by the incompletely known upstream background load. Downstream of the Thompson Island Dam, there were only two temporal data points in the sediment, for 1977 and 1991, available for model calibration, and only the 1991 data directly resolve the surficial (0-5 cm) sediment concentrations. There are a variety of attenuation curves that can be fit between two points. Within the TI Pool, there are also 1998 GE data that became available at the end of the model calibration effort. Surface sediment concentrations in 1998 appear, on average, to be lower than the 1991 results, but the confidence limits generally overlap. Thus, the model fit for the TI Pool also is driven by the relationship between 1977 and 1991 results. The problem is that the 1977 results are highly uncertain, do not provide a fine vertical resolution, and have wide confidence ranges. Starting the model with an initial condition at a value other than the median estimate for 1977 could yield a calibration with a very different attenuation rate. Some supplemental evidence for calibration is provided by depth-composited sediment data from 1984 (TI Pool only) and 1994, but the model does not fit these that well, appearing to yield a consistent over-prediction of non-cohesive sediment concentrations (0-23 cm composites), while under-predicting cohesive sediment concentrations in reaches below Thompson Island Dam.

Among the more important issues addressed by the model are those related to the size of the sediment PCB inventory available for re-release to the water column and the rate at which this inventory is sequestered by deposition. These assumptions are largely embedded within the parameterization of the model since there are no direct measures of available inventory. Indeed given the highly variable nature of sediment deposition and resuspension seen in sediment cores (as discussed in the Low Resolution Sediment Coring Report [USEPA, 1998b]), the direct measurement and integration of these processes over a long period is nearly impossible. However, the parameterization of the model involves several factors that are intended to integrate these processes via a simplified representation. These factors (or parameters) are constrained by little more than the model calibration itself. That is, these parameters are constrained only to the extent that the model is able to reproduce the various monitoring data trends (*i.e.*, water column concentrations at TI Dam, surface sediment concentrations, etc.). The net result of their assigned values must yield a result that closely matches the available data trends.

The model calibration approach does not necessarily yield a unique set of values for the model parameters and indeed there may be several combinations of these values which are capable of meeting the limited data-based criteria, as noted in the RBMR (USEPA, 2000a). The parameters of greatest concern in this regard include the sediment-water exchange coefficient(s), the vertical mixing depth and the vertical mixing velocity. It is likely that these factors vary significantly between cohesive and non-cohesive sediment zones as well as by river mile, but data are lacking to specifically estimate these values by region or sediment domain. Related factors, specifically the deposition rates for cohesive and non-cohesive sediments are also poorly constrained and are largely based on the results of QEA's sediment transport model (SEDZL) which is in turn based on a very limited data set as well.

4.1.1 Vertical Mixing Rates

Comparison of the model results to the 1991 sediment data suggests that the vertical profile of PCB concentrations in cohesive sediments has a lower gradient than is predicted by the model, perhaps due to an underestimate of vertical mixing (USEPA, 2000a [RBMR] Figures 7-17 to 7-19). Other contributing factors may include a lack of explicit representation of groundwater advection, uncertainty in initial sediment conditions, and too high a burial rate. Greater vertical mixing in the cohesive sediments, which contain the highest concentrations of PCBs, would tend to keep the surface concentrations in both cohesive and non-cohesive sediments replenished and thus slow the predicted rate of natural attenuation within those locations. The Low Resolution Sediment Coring Report found a loss of PCB mass from areas with high PCB concentrations that is greater than that implied by HUDTOX at the reach-averaged scale, suggesting that the rate of mixing of vertical mixing in HUDTOX may be low.

It is important to note that the vertical mixing velocity and the vertical mixing depth represented in the model are not "real" constants or parameters that can be measured directly, but rather are part of the necessary simplification of the sediment mixing and exchange processes which must be represented by the model. As part of this simplification, the sediment portion of the model has been constructed as a series of thin layers representing various areas of the river with associated exchange rates. This construction is designed as a manageable means to estimate and integrate the net effects of the highly complex processes of sediment resuspension and settling, biological mixing (bioturbation), sediment bedload transport, anthropogenic disturbances such as boat traffic, storm events, ice scour, and other related processes. While some of these processes are directly represented in the model (*e.g.*, flow-driven resuspension), the model still represents a great simplification of the transport, placement and removal of sediments on the river bottom. Indeed, the PCB contamination of the sediments has been extensively documented and shows conditions that have much greater spatial variability than can be represented in the model.(Brown *et al.*, 1988; USEPA, 1998).

The horizontal scales of the model segment are much greater than the scales of local homogeneity documented by the kriging analysis presented in the Data Evaluation and Interpretation Report (USEPA, 1997a). For comparison, the model is implemented at the scale of sediment segments, which range in size up to approximately 138,000 m^2 in the Thompson Island Pool, and up to approximately 1,283,000 m^2 downstream of the Thompson Island Pool. Model calibration was conducted primarily at the reach scale of average conditions across the Thompson Island Pool, or greater than 2,300,000 m^2. In contrast, sediment mass and concentrations exhibit large variability at areal scales of 10,000 m^2 (USEPA, 1997a). Foraging areas for resident fish may also be well less than 10,000 m^2 (USEPA, 2000a).

Lacking any true constraint in observable data, the vertical mixing depth and the vertical mixing velocity were constrained by limited evidence from site-specific coring data, values from the literature, and, finally, by the model calibration as was described in Section 6.11 and Chapter 7 of the RBMR (USEPA, 2000a). Principally, this meant achieving the measured trend in surface sediments as recorded by a limited number of sampling events, *i.e.*, satisfying the sediment concentration data obtained from GE composite samples collected in 1991 and 1998. In many regions of the river this amounted to only two data points over the calibration period. A further limitation arose from the lack of data to describe differences in cohesive and non-cohesive sediment conditions. Thus both sediment types were assigned the same rates of vertical mixing in the Thompson Island Pool (see Table 7-1 in the RBMR). Mixing depth was set shallower for non-cohesive sediments based on best professional judgement, noting that biological mixing is driven by benthic animals and the density of these animals is lower in coarser, non-cohesive sediment areas. Mixing depth and associated rates were also varied as a function of river section with shallower mixing depths in non-cohesive sediments and slower rates of mixing assumed moving downstream.

These assumptions are justifiable given the shortage of appropriate data and the desire to satisfy the measured surface sediment trends. Although data were available from individual cores that relate to these parameters, these data do not provide a basis for integration across whole reaches. For example, what are the values of these parameters for a region of fine-grained sediments which continues to accumulate sediment at its center while being eroded away at its edges? The *effective* vertical mixing depth as a segment-average representation may be much greater than the few centimeters of homogeneous concentration that might be obtained from a core collected at its center. A core collected near its edge would also tend to show a thin mixing depth as sediment might be removed faster than it could be homogenized vertically. Thus coring results that are representative of local, small-scale mixing rates may not be representative of large-scale sediment mixing in the same region.

Evidence for just such an occurrence can be seen in the USEPA and GE cores collected from *hot spot* 28. Figure 6 represents four cores collected by GE from this *hot spot* in 1998. These cores were intended to match results obtained by the USEPA collected from this area in 1994. Plate 1 shows the locations of these samples along with all other discrete core samples collected by GE in 1998 and 1999. Evident in the two upper diagrams of the figure are peak concentrations located quite close to the sediment-water interface (15 cm or less). These results should be contrasted against the lower two diagrams in the figure, which show peak concentrations at greater depth. All diagrams show a region of relatively homogeneous PCB concentration in their uppermost layers. However, the upper diagrams show a very abrupt transition with concentrations changing more than a factor of four in less than 5 cm. The lower diagrams show a much more gradual change among layers. The fact that the peak concentrations lie so close to the surface and change so abruptly suggests that these sites were subject to a sequence of deposition and scour, perhaps followed by another period of deposition. Thus the vertical mixing rate for this area does not appear to be a balance between a slow rate of deposition with accompanying bioturbation. Rather it may be a dynamic balance of periodic deposition and scour, which potentially serves to re-release a large portion of the existing inventory. The model's spatial scales cannot reflect these local processes and therefore there may be local effects which should be considered separately.

Further support of this assertion can be obtained by comparing the GE results with the matched USEPA low-resolution cores. These are shown in Figure 7. The diagrams in Figure 7 represent four coring locations in 1994 that were replicated in 1998 by GE. The diagrams correspond exactly to those in Figure 6 (*i.e.,* USEPA core LH-28E is the same location as GE core FS-28-1). Although the low-resolution cores lack the fine vertical resolution of the GE cores, they still indicate that the peak concentrations with the sediments in 1994 were substantially deeper relative to 1998 at the sites represented by the upper two diagrams. This would suggest that sediment scour had occurred at these locations during the intervening years. This assertion is also supported by the sediment inventory as represented in mass-per-unit-area. The results are summarized in Table 6. Note that the inventories for sites LH-28E and LH-28I have both declined while the other two sites have remained the same. While these data are too few in number to accurately calculate a loss between 1994 and 1998, the data do suggest that the area is not inherently stable and that its losses are not driven by a simple vertical mixing process. Indeed, the results suggest that "horizontal" mixing, *i.e.,* losses at the perimeter of the area may be quite important. The end result is to suggest that the effective vertical mixing rate and depth for this area may be much greater than that inferred from individual core profiles and expected levels of biological activity. Presumably, similar conditions may be found elsewhere in the Hudson.

Although the example above focuses on the impact of sediment movement on the effective vertical mixing rate and depth, the distribution of the biological community should also affect the relative values of these parameters for cohesive relative to non-cohesive sediments. Specifically, both the biological community and the cohesive sediments are concentrated in the near-shore environment. In particular, the biological community is centered in the finer-grained sediments since these contain higher concentrations of organic matter that are capable of supporting a more robust food web. Along with the higher concentration of biota would be expected higher levels of bioturbation, thus faster and deeper vertical mixing. The parameters used in the model do not account for this phenomenon, because it is not easily quantified and is likely to predominate at spatial scales smaller than those represented in the model.

Reliance solely on core profiles and literature discussions may serve to underestimate these parameters as well, as dateable, undisturbed core profiles are, of necessity, obtained from areas that experience only limited vertical mixing and disturbance of the profile. Use of lower mixing rate and depth values would serve to predict the sequestering of PCBs in the cohesive areas of the river more rapidly than may actually be achieved, thus yielding a more rapid rate of recovery than may actually occur. Additionally, use of mixing depths that are shallower than the *effective* mixing depth may inappropriately predict the depletion of the PCB inventory from the zone of active exchange (by whatever process) and again yield an overly optimistic recovery trajectory for the No Action scenario. Notably, this will also affect the remedial scenario model runs since the model will underestimate the impact of the remediation of cohesive sediment areas.

4.1.2 Exchange Coefficients

HUDTOX was not able to balance PCBs across the Thompson Island Pool under non-scouring conditions using only physical processes explicitly contained in the model. To replicate observed concentrations, it was instead necessary to specify a non-scouring transfer rate of PCBs from sediment to water. This transfer is described as a concentration-gradient process with rate factor k_f, with the same factor applied to both cohesive and non-cohesive sediments, and was determined by fitting to concentration data at the upstream and downstream ends of the Thompson Island Pool. The data-based value of k_f, in combination with the representation of sediment deposition and sediment vertical mixing, determines the relative rates of attenuation of surface concentrations in cohesive and non-cohesive sediments. It should be noted that a single value of k_f does not produce the same Tri+ sediment-water fluxes in cohesive and non-cohesive areas since these areas have different surface concentrations. Nonetheless, it seems possible that different mass transfer coefficients might apply to cohesive and non-cohesive sediments, particularly if the transfer is biologically mediated. If so, an alternative model calibration might be obtained by varying the mass transfer and vertical mixing rates simultaneously.

For model application, values of k_f were estimated from the water column data collected by GE at the upstream and downstream ends of the TI Pool. Observed gains in concentration across the TI Pool at non-scouring flows define k_f. While this approach matches the net gain in Tri+ integrated across the entire TI Pool, it does not take into account any differences in the exchange coefficient between cohesive and non-cohesive sediment. This parameter, just like the rate and depth of vertical mixing, is expected to be biologically influenced. Indeed, the temporal pattern of PCB release from the sediments of the TI Pool strongly suggests such an influence. Again, however, no data are available to definitively determine the degree of difference. Thus the model was calibrated with identical rates for cohesive and non-cohesive sediments.

In addition to the temporal variation of the PCB load from the sediments, there is further evidence that cohesive sediments may have a higher exchange coefficient. Specifically, the float surveys conducted by GE in 1996 and 1997 both documented enhanced surface water concentrations in the near-shore environment. Thus both the concentration of biological activity in the near-shore, cohesive sediment environment as well as the water column float survey data suggest that the sediment-water exchange coefficient for cohesive sediment should be greater than that for non-cohesive sediment. This was examined to a limited extent in Chapter 7 of the RBMR (USEPA, 2000a) and showed that the model calibration was sensitive to this parameter.

The net result of using the same exchange coefficient for both cohesive and non-cohesive sediment could be to over-emphasize the non-cohesive sediment PCB release relative to that from the cohesive sediment. This has potential significance to the remedial decision-making process, as the cohesive sediment *hot spot* areas contain substantial reservoirs of PCBs near the sediment surface.

It is also unclear whether a diffusion-like representation of the sediment-water flux, driven by concentration gradient and interfacial area, is appropriate for summer conditions in TI Pool. Measurements at TID-West over the last four years show summer water column concentrations that are nearly constant for a given month despite a two-fold variation in summer flows. An alternative hypothesis would be that biologically driven sediment-water exchange processes establish near steady-state conditions in the nearshore area, and that water column exposure concentrations are thus a direct function of sediment concentration rather than the sediment-water gradient. If the biological processes operate to a greater depth in the near-shore sediments, this would result in a condition in which the rate of attenuation in exposure concentrations would be expected to be less than is predicted by the HUDTOX model.

Given that the exchange coefficients and the vertical mixing rate and depth are uncertain, then model forecasts of the rate of decline of the PCB concentration in cohesive sediments are also uncertain. Additionally, given the uncertainties in the various parameters, it is conceivable that an alternative calibration could be attained with modified values for these coefficients, *i.e.*, with higher rates for cohesive relative to non-cohesive sediments. The net result could be to yield a larger reservoir of PCB-contaminated sediments available for exchange, resulting in a greater redistribution of PCBs between cohesive and non-cohesive sediments. Low estimates for the cohesive exchange coefficients also affect the remedial action scenarios since, just as for the vertical mixing, the model estimate for remedial alternatives focused on cohesive sediments will not yield as dramatic an effect as may actually be observed.

4.2 Summer Water Column Conditions

Summer water column concentrations represent an important route of exposure for fish in the Upper Hudson. Summer water column PCB concentrations for the period 1996 to 1999 do not show clear trends, indicating that the concentration is possibly controlled by sediment-water exchange and, more importantly, that this process and the sediments that drive it have not declined significantly over this period.

Figure 8 illustrates the consistency of summer surface water concentrations at four stations in the Upper Hudson for the period 1991 to 1999. The most obvious feature for both total PCB and Tri+ is the large change between 1992 and 1993 conditions. Also notable are the near constant mean summer values for the period 1996 to 1999. When load is examined (see Figure 9) the conditions do not seem so constant. There is the expected summer load decline between 1992 and 1993 but also a continued decline in load despite the absence of change in water column concentration. However, when load is viewed as a function of flow, the reason for the decline between 1996 and 1999 becomes evident. The loads decline largely due to a decline in summer flows (see Figure 10). In fact, for the period 1992 to 1999 the relationship between flow and total PCB concentration is linear with a slope of unity. In these years, increases in PCB load are directly proportional to increases in flow. For example, the change in flow at Ft. Edward from 1998 to 1999 is 3500/1900 or 1.84. The change in total PCB load at TID PRW2 is essentially identical at 72/40 or 1.8. The Tri+ load is similar with a ratio of 45/18 or 2.5. The TID west station yields a ratio closer to 2 for Tri+.

The reason behind this correlation with load is the narrow range of PCB concentrations seen in the TI Pool under summer conditions. This is illustrated in Figure 11, which shows the mean monthly concentrations as a function of flow. The results show that within any given month, the water column concentrations remain approximately constant over time. This is clearly seen for July, August and September. June exhibits slightly more variability largely due to conditions in 1998. Typically, concentrations vary by about ±20 percent while flow varies by more than a factor of three (±58 percent).

These results suggest that the TI Pool PCB concentrations are tightly governed by a system at an effective steady state, given that flows remain relatively low. This system is able to maintain similar conditions over a relatively wide range in flow (1500 to 5500 cfs). This suggests in turn that this system is not undergoing a rapid rate of decline and has a sufficiently large reservoir of available sediment-bound PCBs such that no decline in surface water conditions is in evidence over the last four years. This is noteworthy given that the upstream loads have declined more than an order of magnitude during the period 1992 to 1999.

The goal of this discussion is to provide additional emphasis on the importance and potential scale of the sediment reservoir of PCBs in governing TI Pool conditions. Ultimately, it is this reservoir of sediments that must either be depleted or sequestered before PCB levels in fish will decline to levels governed by upstream PCB loads.

4.3 Sediment Redistribution Rates: Evidence from Core Data

Some evidence as to the model's ability to represent sediment redistribution is available from the core data. To the extent that upstream sediment loads control surface sediment concentrations, it would be expected that surface sediment concentrations would decline in response to the decline in upstream surface water loads post-1992. If declines in surface sediment did not occur this would suggest the presence of other mechanisms that exert important controls.

For the GE cores collected in 1998, surface sediments would be responding to the more than order-of-magnitude decline in the upstream load between 1991 and 1997. The decline in water column loads and concentrations is summarized in Table 7. Both the linear interpolation technique (with pulse load corrections) and the ratio estimator yield more than an order-of-magnitude decline in annual load at Ft. Edward.

The 1998 GE coring results were summarized in the RBMR (USEPA, 2000a) in Figures 6-52a, b and c. These figures are reproduced here as Figure 12a through 12c. These core profiles represent a series of cores collected from *Hot Spots* 8, 9, 14, 16, 28, and 37 along with three additional “high resolution”-style cores collected from the TI Pool. The locations of these cores are shown in Plate 1. Most of these coring locations were selected to be coincident with low resolution coring sites (labeled “FS” by GE). The thin upper layers of these cores provide information on the most recent deposition. Evident in Figures 12 a-c is a wide range in trends in the surface sediments with some concentration profiles rising to the surface, some declining and some exhibiting little change in the top ten centimeters. These trends occurred in spite of the dramatic decline in upstream water column PCB loads; that is, they are subject to many other processes besides the upstream load at Ft. Edward.

Given the known trend in external loads, the trend in surface sediment concentration can be used as an indirect measure of the speed and direction of deposition. In instances of rapid sediment accumulation with little vertical mixing, the sediment concentrations would be expected to decline to the same degree as the water column. This is based on an assumption that the surface sediment concentrations are directly correlated with the upstream loading. To the extent that this is not the case, then processes such as vertical mixing and contaminant redistribution within the Pool would be the likely causes of the variable trends.

In Figures 12a, b and c, the range of sediment trends in the top ten centimeters indicates that a range of deposition conditions is present. The fact that water column loads peaked and then declined an order of magnitude in six to seven years would suggest that sites with rising surficial profiles have accumulated little sediment since the 1991 event, thus leaving the high concentrations associated with the Allen Mills releases at the sediment surface. This is suggested by profiles such as FS-08-5, FS-08-6, FS-09-3 and FS-09-4. Alternatively, in the case of FS-08-5 and FS-08-6, long term scour may be at work since the core maximum, and not just a local maximum, occurs at or just below the sediment-water interface. This can be seen in the profiles presented in Figure 12a.

GE obtained additional coring data in 1999 in portions of *Hot Spots* 14 and 16. These data are summarized in Figures 13a to 13d. Nearly all cores were advanced to 15 cm and sliced into 5 cm intervals. These results indicate that *Hot Spot* 14 can be characterized as exhibiting gradual burial in some areas, with core concentrations generally increasing with depth. However, this *hot spot* also contains surface sediments (0-5 cm) as high as 600 mg/kg, suggesting the continued presence of highly contaminated sediments that are not being buried. These hot surface areas might have been re-exposed by scour, or perhaps were simply emplaced in a non-depositional area in the mass movement of sediment that occurred following the removal of the Fort Edward Dam in 1973 and the high flows of the next several years. The core samples for *Hot Spot* 16 are more consistent, with higher concentrations at depth and generally a small range of surface sediment concentrations. This area is indicative of a more consistently depositional environment.

Overall, the core profiles exhibit a wide range of conditions. Only a few exhibit an order-of-magnitude decline in concentration over what might be expected to be the last 6 years of deposition, that is, in the top 5 to 15 cm (see FS-08-3, FS-09-1 and FS-09-2 as examples). The reason for the general lack of decline in the surface sediments is unknown but is undoubtedly related to the cycling of PCBs within and among the Hudson sediments. Both vertical mixing as well as horizontal mixing would serve to maintain contaminated levels near or at the surface.

To represent the fine-scale, heterogeneous nature of the mixing process shown in the core profiles at the broader spatial scale of the model, HUDTOX must make several simplifying assumptions concerning the nature of sediment mixing. Specifically, nearly all sediment mixing is tied to the vertical mixing coefficients. However, this represents an approximation since the importance and magnitude of horizontal mixing is not well constrained, as noted previously. Additionally, the heterogeneity of the core data emphasize that the vertical mixing depth and vertical mixing velocity cannot be determined from the sediment profiles themselves since the cores do not exhibit a single depositional behavior, even within a relatively small area such as a *hot spot.* Rather, these parameters depend strongly on the model conceptual approach and on its levels of spatial, temporal, and process resolution of the underlying fine-scale processes of sediment movement. As such, they cannot be determined independently of the model and thus their magnitude is strongly dependent on the model assumptions.

4.4 Evidence from the Low Resolution Sediment Coring Report and Supporting GE Data

The Low Resolution Sediment Coring Report (USEPA, 1998b) suggests rates of PCB loss from areas with PCB inventories greater than 10 g/m^2 –that are higher than those suggested by the HUDTOX model (although the difference is not statistically significant). GE has commented that this supposed discrepancy casts doubt on the LRC results. While USEPA believes that this can be explained primarily by the differences in the scale of the analyses, another explanation could be that the differences could reflect inaccuracies in the modeling. Some additional evidence on this subject is available from examination of GE coring data.

As part of the examination of the GE sediment data, results were compiled on a Tri+ mass-per-unit-area basis to enable direct comparison among the 1984, 1994 and 1998 sampling programs. These results are summarized in Table 6 for the region below Thompson Island Dam. The GE data generally agree with the matched USEPA low resolution coring data in this region, with a potentially important difference noted in Section 3.1 above. Both surveys confirm the presence of highly contaminated sediments in *Hot Spot* 28 and yield similar levels of PCB inventory in *Hot Spot* 37.

A more useful comparison can be made between the 1984, 1994 and 1998 data for the Thompson Island Pool. The mass-per-unit-area results obtained for both the 1994 and 1998 sampling programs are clearly less than those obtained in 1984, confirming the occurrence of significant PCB losses from fine-grained areas of the TI Pool. These results are summarized in Figure 14, which presents the percent mass loss relative to 1984 plotted as a function of the reported 1984 inventory. With the noted exception of the *Hot Spot* 9 cores, the losses estimated from the GE cores were comparable to or greater than that obtained from the 1994 cores in the same area.

The net result of this analysis is a confirmation of the Low Resolution Sediment Coring Report conclusions, the most important of which is repeated here. Specifically, since 1984 there has been a significant loss of the total PCB inventory from some of the more contaminated sediment areas of the Upper Hudson. As surface sediment concentrations have remained elevated in many of these areas, this loss must occur in conjunction with either vertical mixing of buried PCBs or by scour. Presumably a significant fraction of the PCB mass loss from these areas was redistributed to other nearby sediments while the remainder was transported downstream. The corollary to this conclusion is also worth restating here: The long-term burial of PCBs within the sediments of the Upper Hudson is not assured, since natural sedimentological processes such as resuspension, deposition and bioturbation serve to renew the PCB concentration in the surface sediments of the riverbed. Apparent discrepancies between the LRC and HUDTOX modeling results are likely due to differing spatial scales of observations and modeling, as the model is not designed to simulate the lateral redistribution of sediment within a model segment.

4.5 Conclusions Regarding Potential Model Bias

The conclusions of the analysis of potential model bias are briefly described below:

1. The HUDTOX model is based, wherever possible, on constraints derived from data and avoids

using circumstantial evidence to determine model parameters. However, the data are not sufficient to fully constrain a unique set of parameters. The model does not incorporate built-in conservative assumptions, and potentially may over-estimate rates of natural attenuation. Application of a margin of safety to model results is appropriate to select a remedial option that provides reasonable assurances of meeting risk targets.

2. Sediment core tops show a wide range of conditions, even within the upper ten centimeters, indicating the complexity and heterogeneity of the sediment-PCB transport process. As a result, there is little direct sediment core evidence to constrain the vertical mixing parameters.

3. The model parameters for vertical mixing velocity, vertical-mixing depth, sediment-water exchange from specific sediment areas, and sediment deposition are poorly constrained by data and largely dependent upon the model calibration. These parameters were not specifically developed to address cohesive and non-cohesive sediment conditions and may underestimate the role of cohesive sediments in the Upper Hudson PCB balance. Data to define the spatial resolution of these parameters are limited and the assigned values may not accurately characterize the relative contributions of cohesive and non-cohesive sediments. This raises the possibility that the model may represent a somewhat optimistic estimate of the rate of river recovery at the model segment scale. Even slower rates of recovery are likely in localized areas at scales smaller than the model segments.

4. Summer water column conditions show little sign of decrease over the past 4 years. These results suggest a robust system of sediment-water exchange that may not be sensitive to rapid depletion of PCB concentration at the sediment-water interface. Thus, the model is also potentially optimistic as to the rate of decline in water column exposure concentrations.

5. The 1998 GE coring results confirm the major conclusions of the Low Resolution Sediment Coring Report. Specifically, since 1984 there has been a significant redistribution of PCB mass from some areas of high concentration in the Upper Hudson.

6. The long-term burial and sequestration of PCBs within the sediments of the Upper Hudson is not assured. Even if burial and depletion of near-surface concentrations occurs at the reach-averaged scale, this does not assure reduction of sediment exposure concentrations at the more localized scale at which fish feed.

5. Spatial Scale

The choice of model spatial scale influences both the model behavior over the forecast period and the ability of the model to represent potentially important processes occurring on a small spatial scale. For example, a model representing the entire TI Pool as a single cell would not be able to distinguish between actively eroding portions of TI Pool and depositional areas. Such a model could only capture the average changes in concentrations in the TI Pool. A finer scale model may well describe the same average behavior as a single-cell model. However, it could also potentially describe fine-scale differences in erosion and scour behavior. The HUDTOX model represents long-term dynamics on the scale of the model segments, but not specific events on smaller spatial scales (it predicts net erosion or net deposition within a given model segment). Erosion may also be occurring on smaller spatial scales, maintaining elevated surficial concentrations in localized areas, which may not show up in the forecast predictions. As noted previously, the spatial scale of sediment segments within the Thompson Island Pool ranges up to 138,000 m^2 in the Thompson Island Pool and up to approximately 1,283,000 m^2 downstream of the Thompson Island Pool, whereas sediment mass and concentrations exhibit large-scale variability at areal scales of less than 10,000 m^2 (USEPA 1997a).

During the RBMR Peer Review, it was emphasized that the Hudson River is not a lake. In a lake, deposition is likely to be relatively constant and homogeneous, resulting in burial of inplace sediments. In the more dynamic riverine environment of the Hudson, deposition is expected to vary in both space and time.

The spatial variability of deposition means that net deposition at the reach-average scale does not guarantee that any specific location within the river is being buried at the reach-averaged rate, and some locations may be subject to intermittent scour, while others simply may not receive any significant deposition. This type of situation is evident in the area of *Hot Spot* 14 in the Thompson Island Pool. *Hot Spot* 14 appears to have been emplaced by mass movement of sediment following the removal of the Fort Edward Dam, and not by regular depositional processes. As discussed in the previous section and shown in Figures 13a and 13b, recent vertical profiles in this area appear to show a mix of some areas receiving gradual deposition and other areas that are either being eroded or at least are not being buried. The key to understanding these observations is that they represent processes which are occurring at a spatial scale smaller than can be represented in the HUDTOX model.

Net deposition occurring within a river segment should also not be confused with the *steady* deposition typical of lake environments. In many areas in which net deposition does occur, it is likely to occur through a seasonal cycle of disturbance and resettling, which may include bedload movement and sediment wave propagation. This can result in a situation in which new sediment mixes with, rather than overlays existing sediment. In such a situation, deposition does not result in "capping" of existing sediment inventory; rather it leads to gradual dilution of the surface sediment concentration (Figure 15).

Nonetheless, as noted in previous sections, HUDTOX provides the best basis to forecast future conditions on a *reach-averaged* basis. But, fish do not feed on the reach-averaged scale. Indeed, their foraging range is likely to be significantly smaller. For instance, the reported foraging range of largemouth bass is on the order of 7,000 square meters (RBMR [USEPA, 2000a], Appendix A). Thus, representation of average geochemical processes at the model reach scale does not guarantee accurate representation of exposure concentrations experienced by individual fish.

These concepts are useful for understanding limitations of the model and for comparing the HUDTOX predictions and observations from the LRC (USEPA, 1998b). Because the HUDTOX model segmentation can only describe average behavior on the scale of the segmentation grid, the model may not show erosion of sediments in a model segment, even though such processes may in fact be occurring at specific locations within the segment. The importance of these erosion processes could increase in the future. The LRC findings may provide insight into the variability of these processes and do in fact seem to support the notion that there may be reworking of the sediments on scales finer than the model segmentation.

The relative importance of exposure from fine-scale areas of elevated sediment concentration may increase over time as surface sediment concentrations continue to decline, given the assumption that bioaccumulation by benthos is driven by the concentration gradient between sediment and the organisms. The model may predict that segment-averaged concentrations show a steady decline due to net deposition of cleaner sediments. But, if localized areas of higher concentration continue to be exposed, significant bioaccumulation by benthos may occur despite the segment-average decline in concentration. For example, the influence of a localized sediment area exposed at an average PCB concentration of 10 mg/kg within a specific river subsection is larger if the other sediments are at 0.2 mg/kg as opposed to 2 mg/kg. This may cause a change in the rate of response of average surface sediment concentrations from that observed in the calibration, and the model may not necessarily describe this because the localized areas of scour are smaller than the model segmentation.

The significance of the points discussed above is that even though the model may predict net deposition on a river subsection basis over the forecast period, there may be localized areas that continue to experience erosion. These localized areas are at spatial scales smaller than can be accurately represented in the model given available data; however, they may have an important impact on PCB body burden of fish that forage in the area. Remediation that addresses such areas will provide risk reduction benefits that cannot be captured at the segment-averaged scale of the models.

6. Construction of a Bounding Forecast

In general, HUDTOX and FISHRAND represent credible, defensible tools for forecasting time trends in PCB concentrations in the Hudson River. But, these forecasts are subject to considerable uncertainty, and deficiencies in the data available for calibration raises the possibility that the model "best estimate" of trends could be overly optimistic for the No Action and Monitored Natural Attenuation scenarios. This is particularly likely at localized spatial scales at which fish feed, and may be reflected in the lack of a declining trend in recent fish data collected by NYSDEC in TI Pool and in the Stillwater-Coveville area.

The discussions in previous sections highlight the rate of decline of bioavailable cohesive sediment PCB concentrations (at the local exposure scale) as a key uncertainty for the model forecasts. To address this issue, an upper bound forecast may be constructed based on the assumption that sediment exposure concentrations experienced by fish decline at a slower rate than predictions at the reach scale provided by HUDTOX.

Construction of this alternative, bounding forecast starts from 1998, because FISHRAND is calibrated to data through 1997, and provides a good estimate of fish concentrations (on a lipid basis) in the 1998 validation period. A slower rate of decline in the cohesive sediment exposure concentration is assumed from this point, and compared to the No Action and Monitored Natural Attenuation forecasts obtained directly from HUDTOX and FISHRAND. The following procedure was used to develop the bounding forecast:

1. Assume HUDTOX provides a best-estimate forecast of water column concentrations and non-cohesive sediment concentrations. These concentration fields are likely to be less heterogeneous than cohesive sediment concentrations, and the ability of the model to predict water column loads is validated at the reach scale. The potential for model bias in the prediction of water column concentrations, both temporally and spatially, as discussed above, is not accounted for in the bounding forecast, but should be considered in the risk management process.

2. Assume that localized bioavailable surface sediment concentrations (that is, the PCB concentration in the depth range subject to feeding by burrowing benthic organisms) in cohesive sediments declines at a rate much slower than the reach averaged rate predicted by HUDTOX. Assume that the 1997 sediment exposure concentrations are approximately correct (that is, they result in approximately correct predictions of lipid-based fish body burden with the calibrated FISHRAND model), but that the half-life for future declines in cohesive sediment exposure concentration is on the order of 50 years, consistent with recent observations of concentration trends in brown bullhead in the Thompson Island Pool.

3. Calculate sediment exposure concentration by year assuming 75 percent of exposure is derived from cohesive sediments (based on 1997 concentrations with a 50-year half-life) and 25 percent from non-cohesive sediment concentrations predicted by HUDTOX. This is consistent with assumptions used for the sediment exposure pathway in previous FISHRAND modeling.

4. Substitute the new forecast sediment exposure field into FISHRAND and re-run the No Action and Monitored Natural Attenuation (MNA) scenarios to provide a bounding calculation. These scenarios are

run with a model "spin up" that includes the 1991 sediment reinitialization and 1998-1999 HUDTOX validation results, using observed flows and upstream loads, except that the 50-year half life trend is imposed on cohesive sediment exposure concentrations starting in 1997.

Results of the alternative bounding forecast for the No Action (constant upstream load) and Monitored Natural Attenuation (step-down upstream load in 2005) are shown in Figures 16–21 for largemouth bass, brown bullhead, and yellow perch at RM 189 (Thompson Island Pool) and RM 184 (Schuylerville). In these figures, the bounding forecasts are denoted as "No Action (alt.)" and "MNA (alt.)"

As is evident from the figures, assumption of a slower rate of decline in cohesive sediment exposure concentrations has a large impact on forecasts. The difference between the alternative bounding calculation and the baseline HUDTOX/FISHRAND forecast is greatest for brown bullhead, as these are the fish whose PCB body burdens are most closely tied to sediment concentrations. Interestingly, the magnitude of the responses to the alternative formulation are different at RM 189 and 184, particularly for largemouth bass. This reflects the fact that the FISHRAND calibration differs above and below Thompson Island Dam, reflecting differing observations on total organic carbon concentrations and benthic lipid content. As a result, largemouth bass body burdens are simulated as being more strongly dependent on sediment exposure concentrations at Schuylerville than in the Thompson Island Pool. It is also of interest to note that when the cohesive sediment concentrations are held high, the MNA and No Action results converge for the species more sensitive to sediment exposures. This implies that the major impact of upstream load reduction in the HUDTOX forecasts for MNA is through its effect on depletion of near-surface cohesive sediment concentrations in the model. Given the presence of areas such as *Hot Spot* 14 in which near-surface PCB concentrations do not appear to depend strongly on upstream PCB concentrations, construction of a bounding forecast which essentially decouples the localized sediment exposure field from upstream appears reasonable.

Table 1. Half-Life Comparison of Model and Data Lipid-Based Annual Average PCB Concentrations in Fish

		Thompson Island Pool (RM 189)					Stillwater Reach (RM 168–176)				
		1985–99	**1985-91**	**1995-99**	**1999-2004**	**1999-2020**	**1985–99**	**1985-91**	**1995-99**	**1999-2004**	**1999-2020**
Brown Bull-head	Data - Consistent Tri+	5.57 (1986-99)	3.06 (1986-91)	50.00			6.97	3.61	Increasing		
	Data - NYSDEC Sum	8.15 (1986-98)	4.65 (1986-91)	Increasing (1995-98)			8.51 (1985-98)	4.28	Increasing (1995-98)		
	Data - NYSDEC 1254	5.41 (1986-98)	3.30 (1986-91)	14.48 (1995-98)			7.47 (1985-98)	3.57	Increasing (1995-98)		
	Model	5.22	4.42	7.27	8.75	12.65	9.83	10.69	6.06	5.89	12.30
Large-mouth Bass	Data - Consistent Tri+	12.78	Increasing	Increasing			9.19	6.10	41.95		
	Data - NYSDEC Sum	46.97 (1985-98)	Increasing	Increasing (1995-98)			15.90 (1985-98)	17.53	20.44 (1995-98)		
	Data - NYSDEC 1254	21.26 (1985-98)	294.01	Increasing (1995-98)			9.81 (1985-98)	11.99	10.56 (1995-98)		
	Model	7.35	5.05	4.10	12.66	25.16	9.65	9.10	7.18	6.52	13.18
Pump-kinseed	Data - Consistent Tri+	5.91 (1987-98)	Increasing (1987-91)	Increasing (1995-98)			7.96 (1985-98)	7.43	2.66 (1995-98)		
	Data - NYSDEC Sum	15.04 (1987-98)	Increasing (1987-91)	Increasing (1995-98)			25.61 (1985-98)	18.46	3.37 (1995-98)		
	Data - NYSDEC 1254	9.87 (1987-98)	Increasing (1987-91)	Increasing (1995-98)			12.63 (1985-98)	15.77	2.83 (1995-98)		
	Model	8.10	7.44	4.33	38.62	35.38	9.62	11.40	7.21	6.06	13.09

		Thompson Island Pool (RM 189)					Stillwater Reach (RM 168–176)				
		1985–99	**1985-91**	**1995-99**	**1999-2004**	**1999-2020**	**1985–99**	**1985-91**	**1995-99**	**1999-2004**	**1999-2020**
Yellow Perch	Data - Consistent Tri+								Increasing		
	Data - NYSDEC Sum						5.78 (1984-98)		Increasing (1995-98)		
	Data - NYSDEC 1254						5.10 (1984-98)				
	Model	7.16	5.74	4.36	14.87	25.44	9.82	9.80	7.00	6.36	12.37

Notes:

Consistent Tri+: NYSDEC data converted to consistent Tri+ basis (see RBMR) plus NEA congener data.
NYSDEC Sum: Uncorrected sum of lipid-based PCBs reported by NYSDEC, including provisional 1999 results
NYSDEC 1254: Uncorrected Aroclor 1254 quantitations reported by NYSDEC.
Model: Output of HUDTOX/FISHRAND models on lipid basis; forecasts represent No Action simulation with constant load upstream boundary. Annualized arithmetic means computed from 25th, 50th, and 95th percentile estimates.

Table 2. Model Half Lives (years) for Annual PCB Tri+ Water Column Load

	Thompson Island Dam	Northumberland Dam (Schuylerville)	Federal Dam (Waterford)
1985-1999	9.81	9.72	10.56
1985-1990	18.99	24.49	27.26
1985-1989	5.23	5.65	6.02
1995-1999	9.12	7.65	7.85
1999-2004	14.37	10.79	5.51
1999-2020	23.85	18.54	12.19

Table 3. Model Half Lives (years) for Average PCB Tri+ Water Column Concentration

Annual Average	Thompson Island Dam - West	Northumberland Dam (Schuylerville)	Federal Dam (Waterford)
1985-1999	9.45	9.57	9.816
1985-1990	6.15	6.36	6.24
1995-1999	7.75	7.18	6.92
1999-2004	67.82	25.71	8.56
1999-2020	29.49	23.64	13.25
Summer Average (May-September)			
1985-1999	9.14	9.13	9.42
1985-1990	4.50	4.84	5.21
1995-1999	7.18	6.73	6.79
1999-2004	63.67	24.56	8.83
1999-2020	24.83	20.73	12.75

Table 4. Half Life (years) for Tri+ PCB Concentrations in Surface Sediment Layer from HUDTOX Model

Time Span	TIP Average - Cohesive	TIP Average - Noncohesive	Lower TIP - Cohesive	Stillwater Pool - Cohesive	Federal Dam - Noncohesive
1977-1985	6.04	7.92	5.95	4.47	5.91
1985-1990	5.84	8.27	5.60	4.63	6.16
1985-1999	8.40	9.54	4.50	10.23	7.78
1991-1998	8.16	8.87	8.42	5.17	10.37
1995-1999	7.89	9.10	8.38	5.28	9.50
1999-2004	7.36	9.86	7.22	4.72	6.64
1999-2020	9.42	10.22	11.45	9.90	8.97

Notes: Estimates correspond to the model series used in FISHRAND, which combine the longterm hindcast for 1977-1990, 1991 restart short-term hindcast for 1991-1997, validation runs for 1998-1999 using actual boundary conditions, and No Action constant upstream load forecasts (p3nacw) for 2000 on.

The TIP average results represent averages across all model segments within the Thompson Island Pool. The last three columns are results from the segments of the HUDTOX model used in the FISHRAND calibration.

Table 5. Surface (0-5 cm average) PCB Concentrations in Co-located 1991 and 1998 GE Samples

Location	Sedt. Type	1991 Samples		1998 Samples		
		Identifier	Average Tri+	Identifier	Average Tri+	Change
TIP RM 193, East Shore	fine	8B-F3	5.36	BS-06T-200	3.88	-27.6%
TIP RM 193, West Shore	fine	8B-F6	6.44	BS-06F-100	2.47	-61.6%
TIP: above Snook Kill	fine	8C-F4, 8C-F5	10.72	BS-08F-100	5.64	-47.4%
TIP: opposite Snook Kill	fine	8C-F7	11.64	BS-08F-200	21.18	82.0%
TIP: Hot Spot 10	fine	8C-F6	31.10	BS-10T-100	18.69	-39.6%
TIP: Griffin Is., Hot Spot 14	mixed	8E-F4, 8E-F5, 8E-C2	40.72	BS-14T-100, BS-14F-200	36.85	-9.5%
TIP: below Griffin Is.	coarse	8F-C1	12.95	BS-15C-200	6.67	-48.5%
TIP: below Griffin Is.	coarse	8F-C2	1.07	BS-15C-300	1.11	3.7%
TIP: above TI Dam	mixed	8F-F3, 8F-C4	9.28	BS-18T-100, BS-18C-200, BS-18C-300, BS-18C-400	8.67	-6.6%
below Lock 6	fine	6B-F2	26.3	FS-28, 1-3	26.6	1.1%
Lock 3	fine	4AB-F1	5.83	FS-37, 1-3	5.47	-6.2%

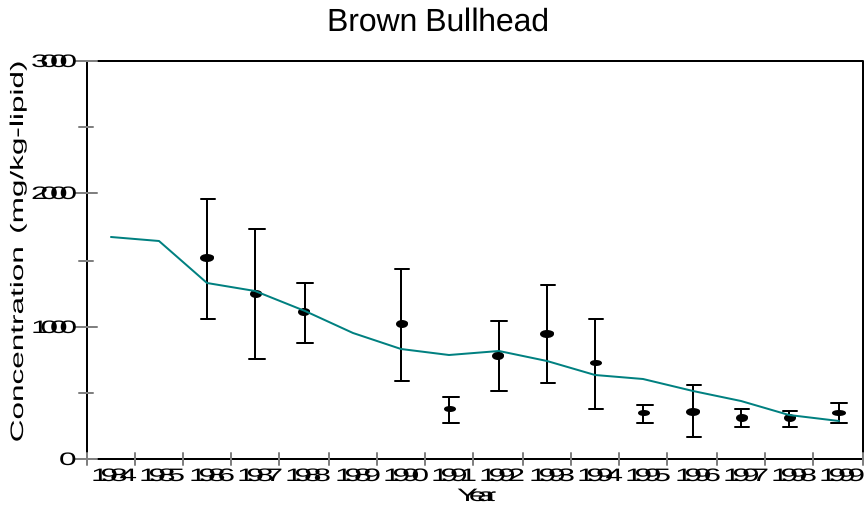
Table 6. Comparison of Mass-per-Unit-Area Results from NYSDEC (1984), USEPA Phase 2 (1994) and GE (1998&99) Sampling Events

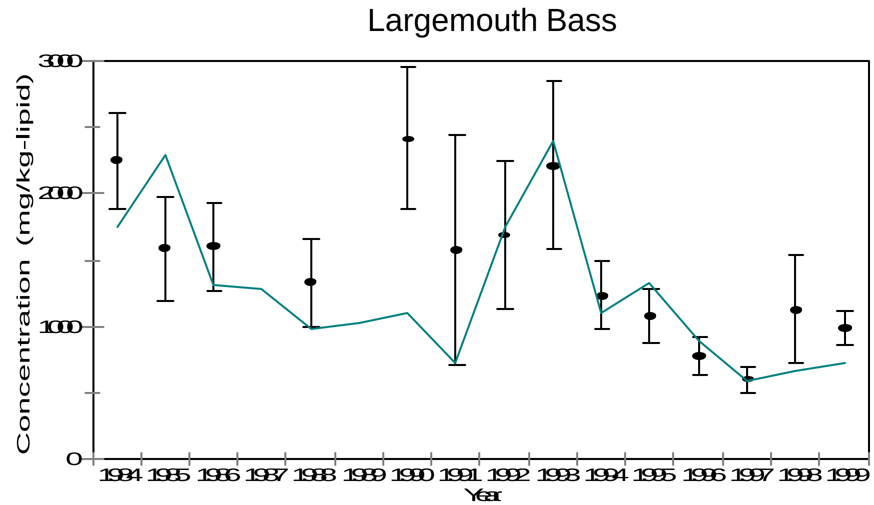
1994 Phase 2 Location	1984 Tri+ MPA g/m^2	1994 Tri+ MPA g/m^2	1998&99 GE Location	1998&99 Tri+ MPA g/m^2	Percent decline from 84 to 94 %	Percent decline from 84 to 98&99 %	Tri+ MPA Difference (94-84) g/m^2	Tri+ MPA Difference (94-98&99) g/m^2
Below TI Dam								
LH-28E		75.73	FS-28-1	3.00				72.7
LH-28I		47.69	FS-28-2	41.21				6.5
LH-28M		54.59	FS-28-3	50.82				3.8
LH-28N		31.53	FS-28-4	32.68				-1.1
LH-37C		3.04	FS-37-1	6.68				-3.6
LH-37J		7.16	FS-37-2	5.42				1.7
LH-37K		1.76	FS-37-3	4.59				-2.8
LH-37O		25.95	FS-37-4	33.15				-7.2
TI Pool								
LR-12C	3.9	2.09	FS-08-5	3.14	-47	-20	-1.8	-1.1
LR-11C	48.0	10.50	FS-08-6	2.82	-78	-94	-37.5	7.7
LR-11B	62.1	13.09	FS-08-7	2.18	-79	-96	-49.0	10.9
LR-09F	11.7	3.54	FS-09-1	3.31	-70	-72	-8.2	0.2
LR-09E	43.0	4.01	FS-09-21	0.68	-91	-98	-39.0	3.3
LR-09C	23.4	6.00	FS-09-3	16.97	-74	-27	-17.4	-11.0
LR-09A	11.1	5.46	FS-09-4	9.09	-51	-18	-5.7	-3.6
LR-09D	75.4	2.00	FS-09-5	6.11	-97	-92	-73.4	-4.1
LR-04A	68.3	7.30	FS-14-1	14.13	-89	-79	-61.0	-6.8
LR-04A	68.3	7.30	FS-14-11	20.17	-89	-70	-61.0	-12.9
LR-04A	68.3	7.30	FS-14-12	22.84	-89	-67	-61.0	-15.5
LR-04A	68.3	7.30	FS-14-13	17.02	-89	-75	-61.0	-9.7
LR-04A	68.3	7.30	FS-14-14	15.43	-89	-77	-61.0	-8.1
LR-03A	17.6	0.07	FS-16-1	0.20	-100	-99	-17.5	-0.1
LR-03A	17.6	0.07	FS-16-14	0.12	-100	-99	-17.5	0.0
LR-02B	52.7	10.26	FS-16-2	1.50	-81	-97	-42.5	8.8
LR-02B	52.7	10.26	FS-16-11	0.13	-81	-100	-42.5	10.1
				Average decline	-80	-76		

Table 7. Upper Hudson Tri+ PCB Water Column Load Estimates

Year	Average Tri+ Conc. (ng/L) (Linear Interp.)[1]	Ft. Edward Tri+ Conc. (ng/L) (Ratio Est.)	Annual Tri + Load (kg.) (Linear Interp.)[1]	Annual Tri+ Load (kg.) (Ratio Est.)	Flow weighted yearly avg. Tri+ Conc. (ng/L) (Linear Interp.)[1]
1991	100.8		268		67.3
1992	149.2	150.8	608	660	139.1
1993	43.1	92.6	246	409	55.7
1994	39.8		166		35.3
1995	34.0	60.8	117	224	31.7
1996	13.1	10.9	72	66	11.8
1997	10.3[2]	7.3	31[2]	35	8.8
1998	30.0	14.7	137	67	
1999		15.3		32	

Notes:
1. As reported in the RBMR (USEPA, 2000).
2. Results are based upon the partial year's data (1/1/97 to 7/25/97).





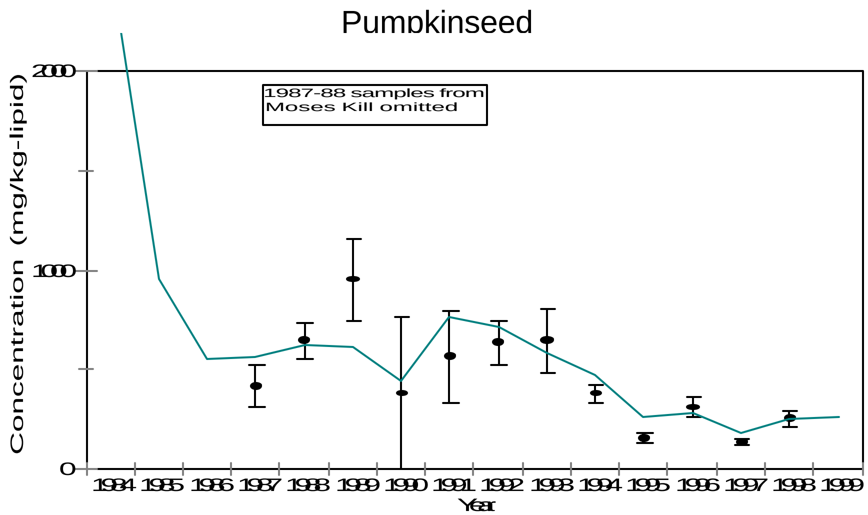
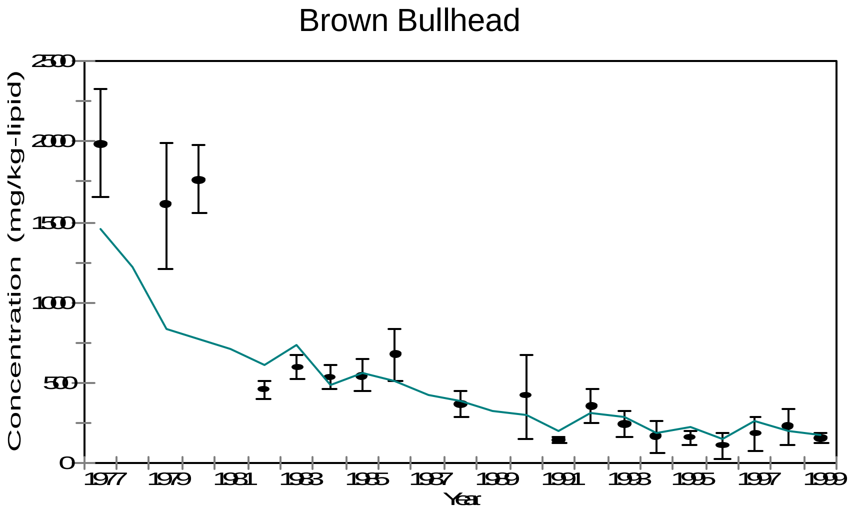


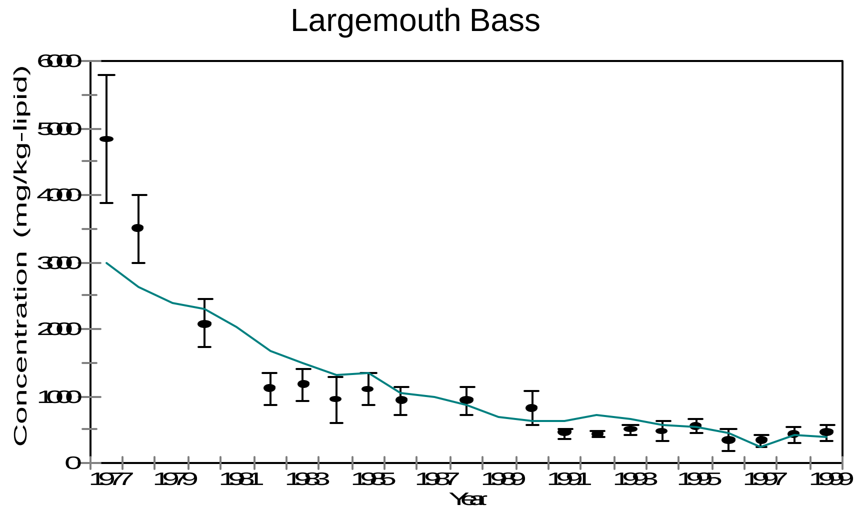
Figure 1. Lipid-based Tri+ PCB Concentrations in Fish, Thompson Island Pool (RM 189)

Vertical bars show arithmetic means and 95% confidence limits for NYSDEC observations, converted to a consistent Tri+ basis.

Solid line shows FISHRAND median predictions.

Note 1998-1999 FISHRAND predictions are based on HUDTOX forecast runs rather than actual hydrology and upstream boundary loads.





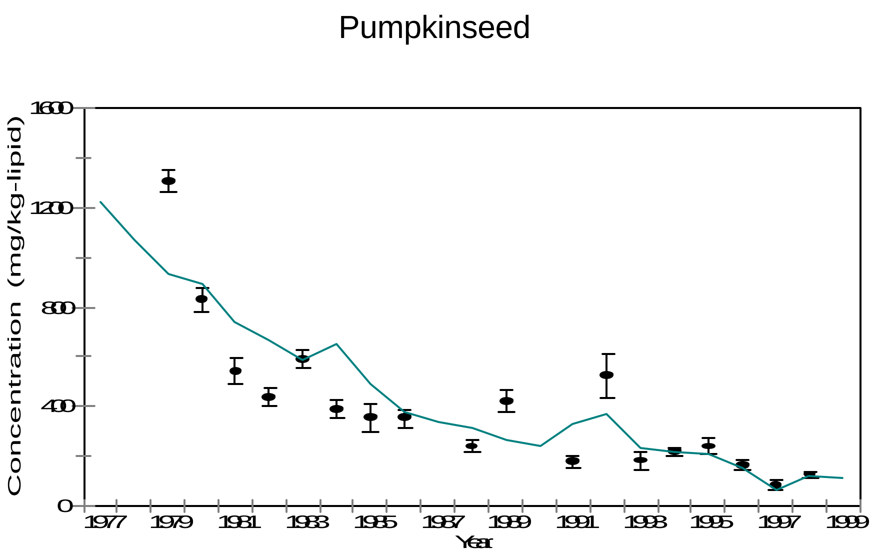


Figure 2. Lipid-based Tri+ PCB Concentrations in Fish, Stillwater Reach

Vertical bars show arithmetic means and 95% confidence limits for NYSDEC observations, converted to a consistent Tri+ basis.

Solid line shows FISHRAND median predictions.

Note 1998-1999 FISHRAND predictions are based on HUDTOX forecast runs rather than actual hydrology and upstream boundary loads.

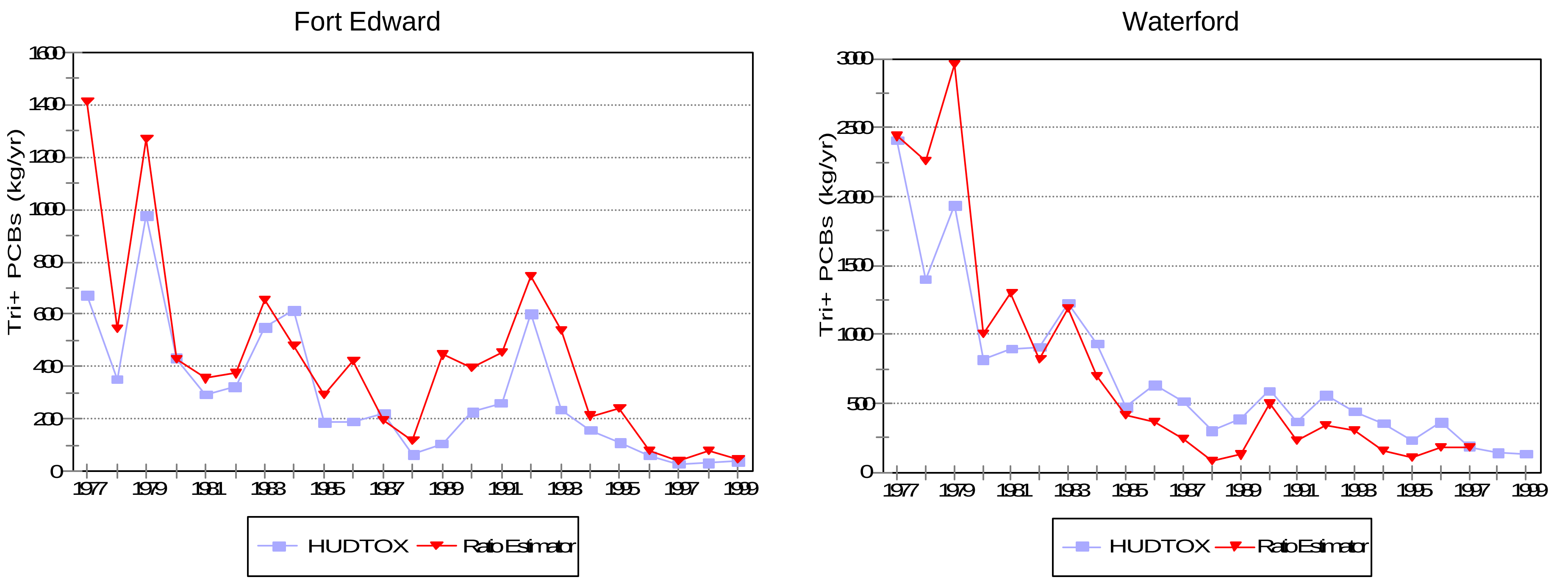


Figure 3. Model/Data Comparisons of Tri+ Load at Fort Edward and Waterford

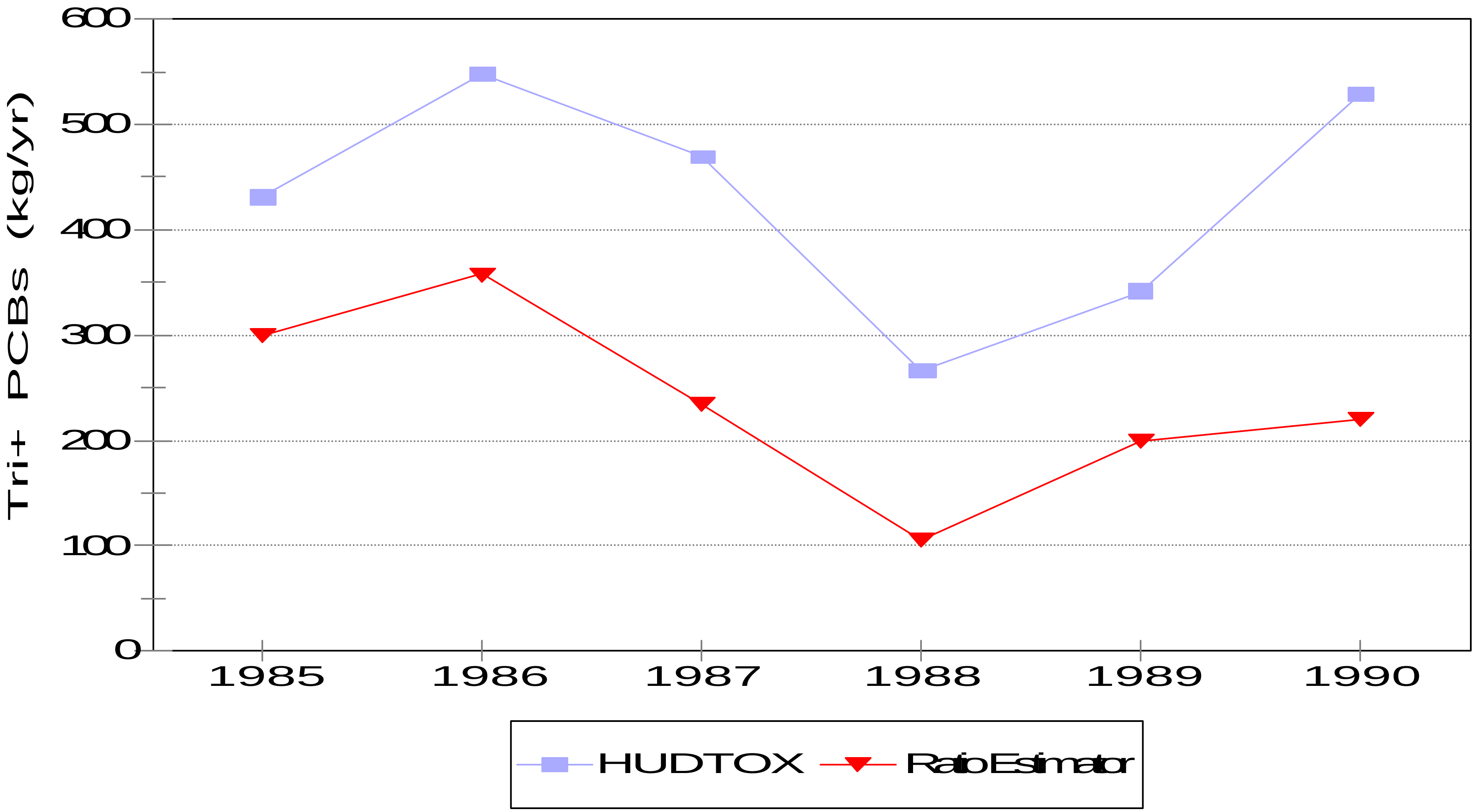
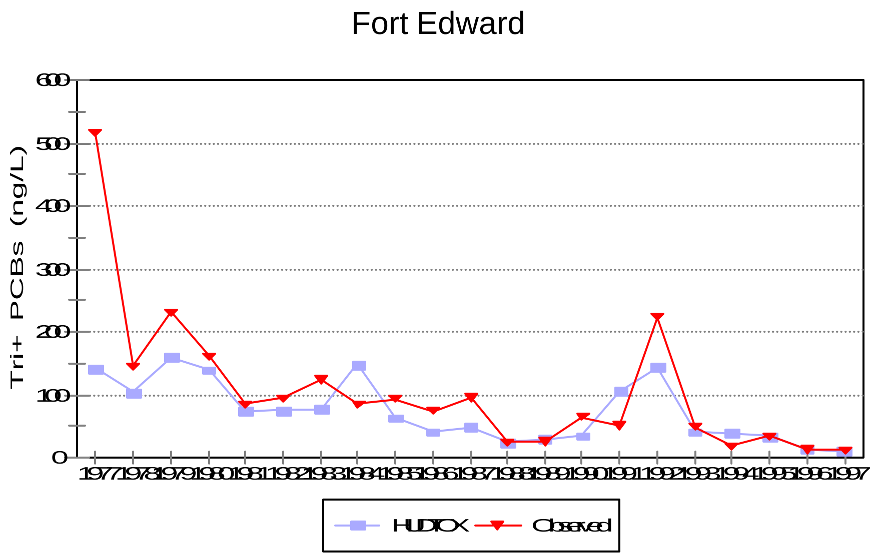
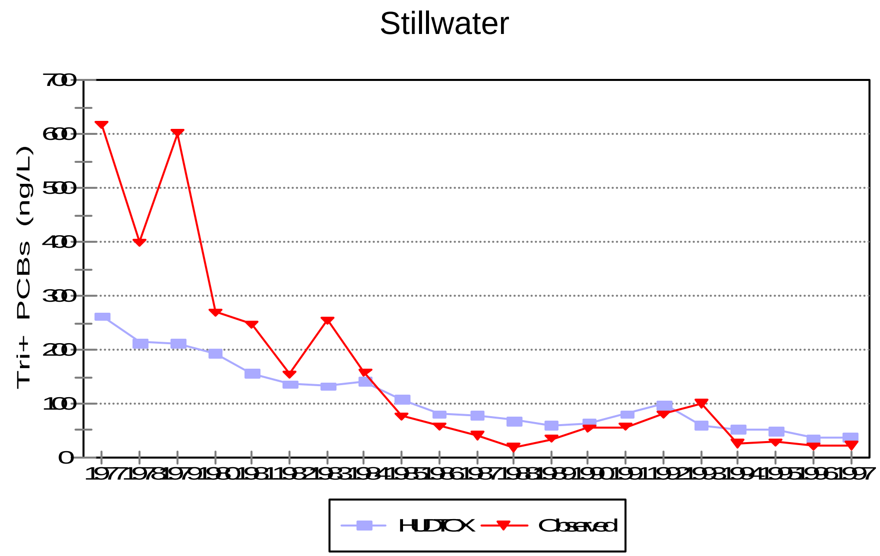


Figure 4. Annual Tri+ PCB Loads at Stillwater, 1985-1990





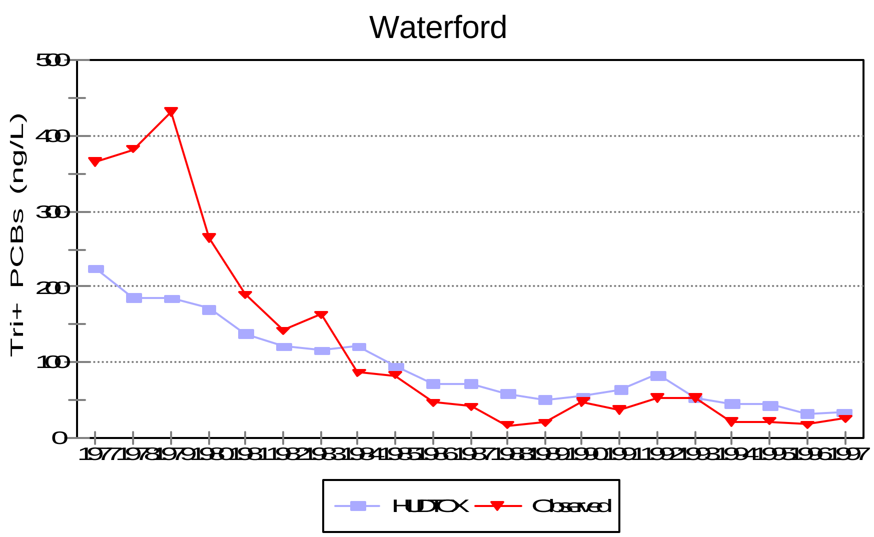


Figure 5. Tri+ PCB Annual Average Water Column Concentrations

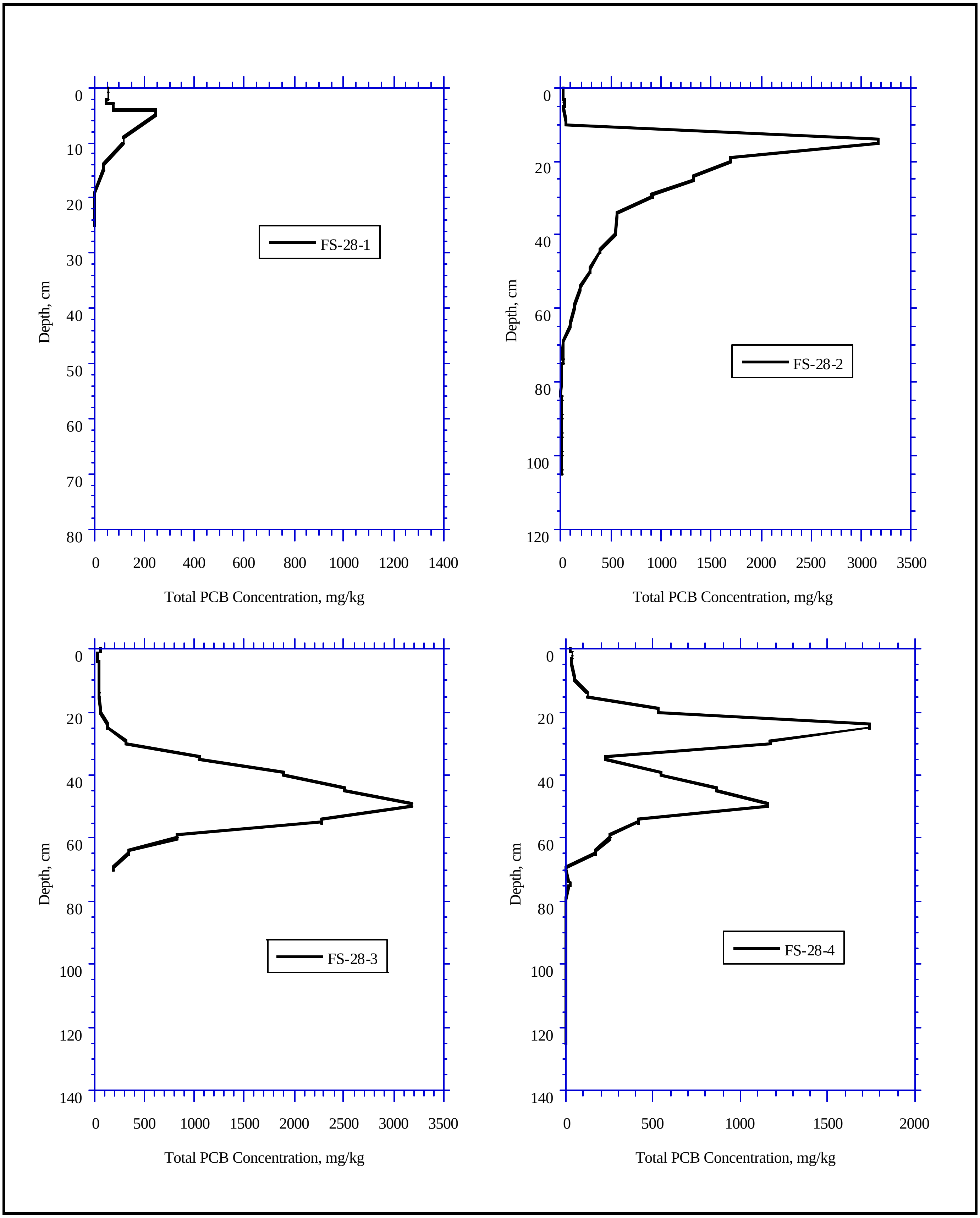


Figure 6.
1998 Total PCB Profiles at Hot Spot 28 (GE Samples)

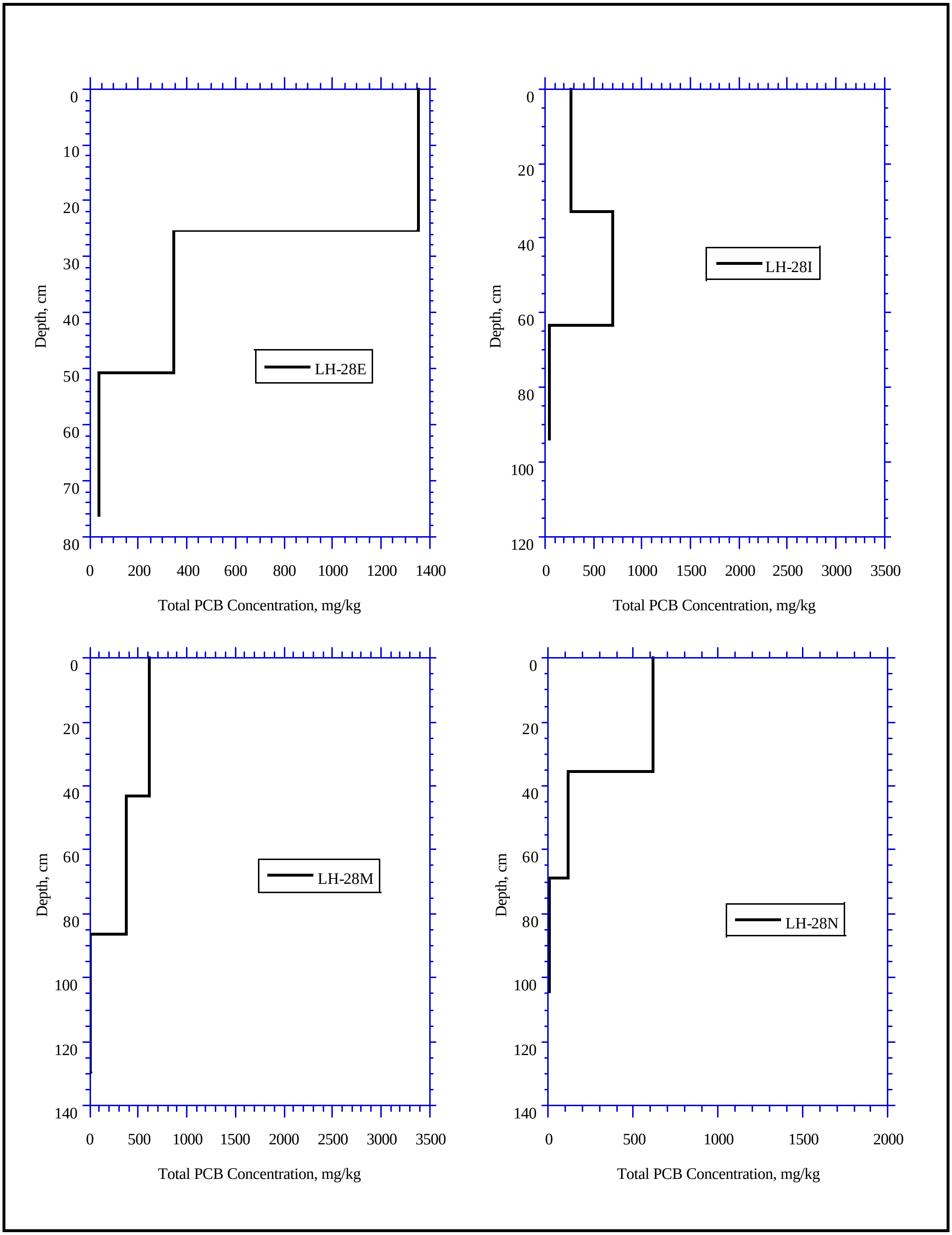
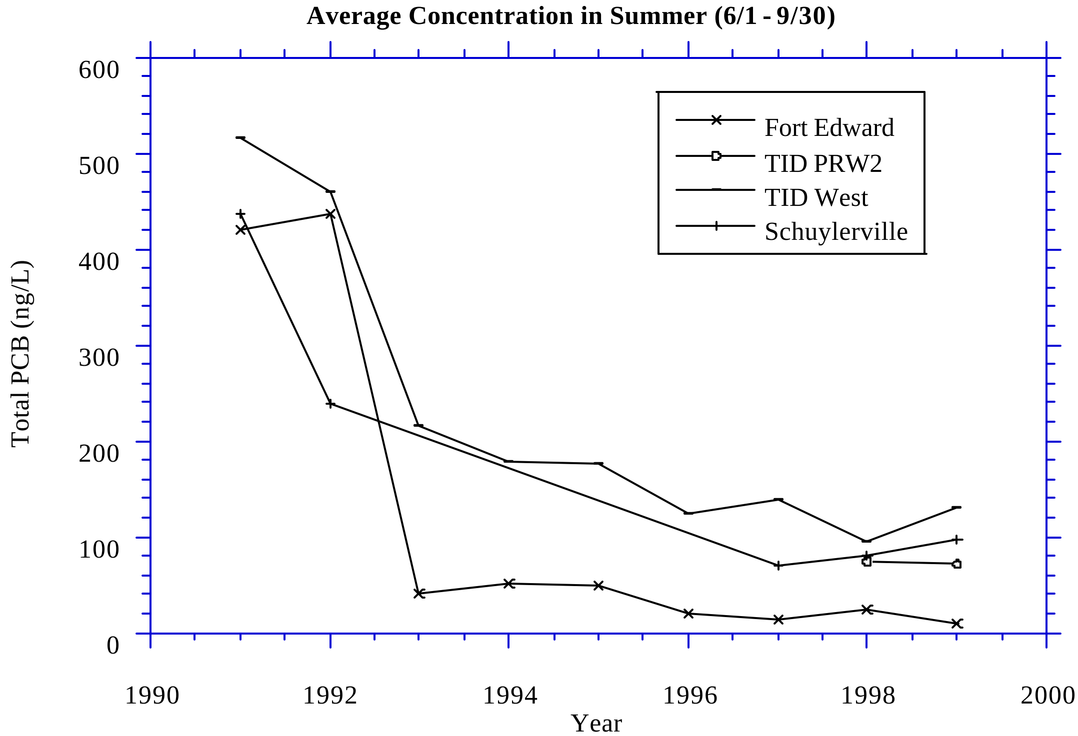


Figure 7.
1994 Total PCB Profiles at Hot Spot 28 (Phase 2 LRC Samples)



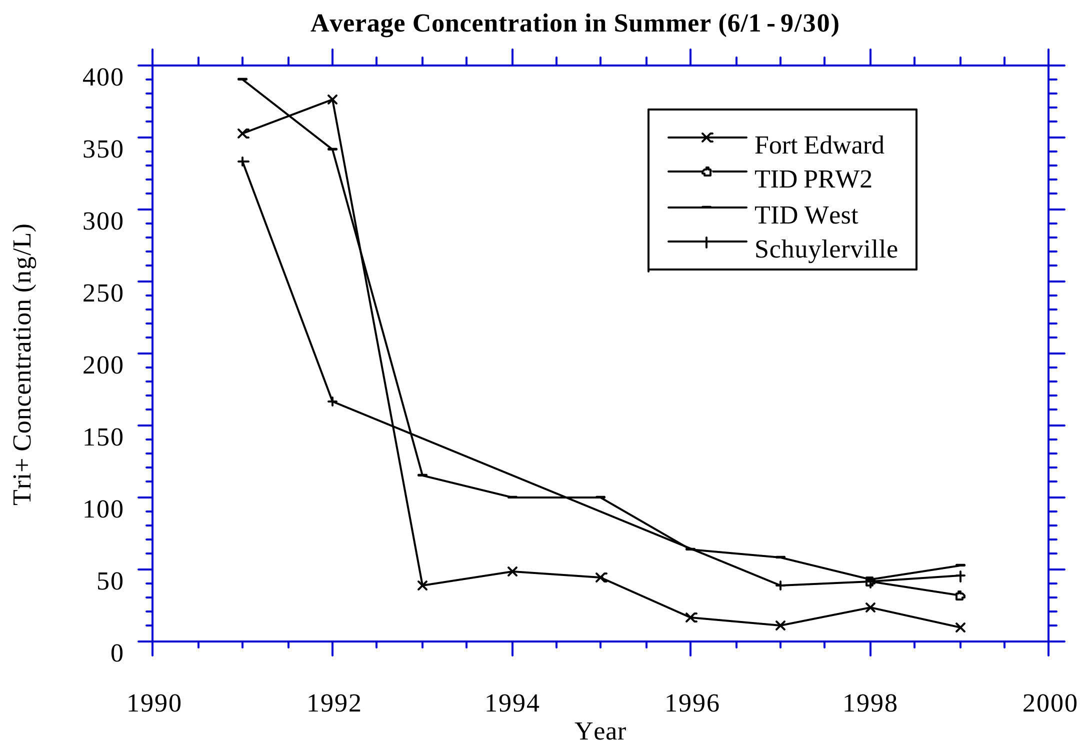


Figure 8.
Average Summer Water Column Concentration in the Upper Hudson 1991-1999 (Ratio Estimator)

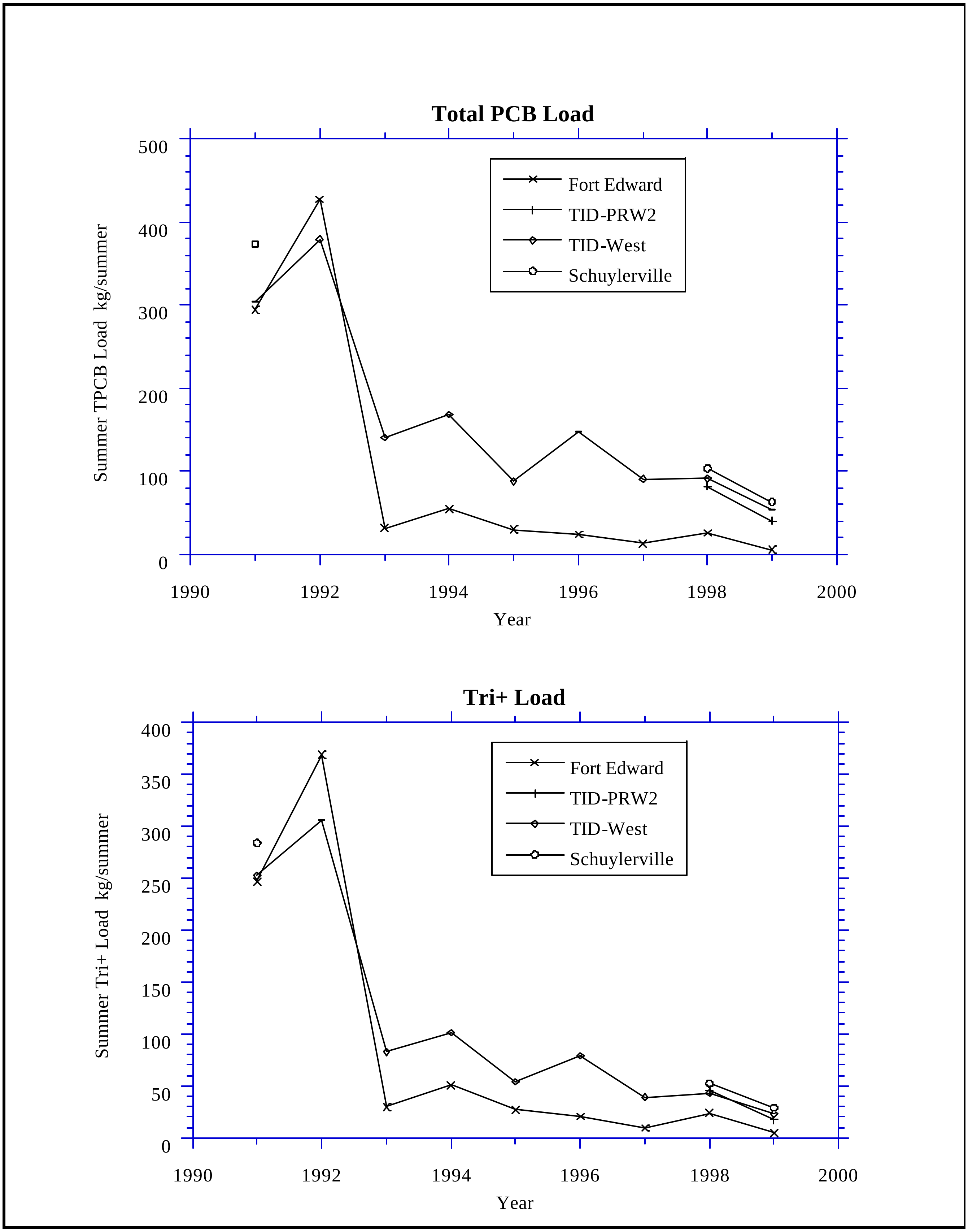


Figure 9.
Summer Water Column Load in the Upper Hudson 1991-1999
(Ratio Estimator)

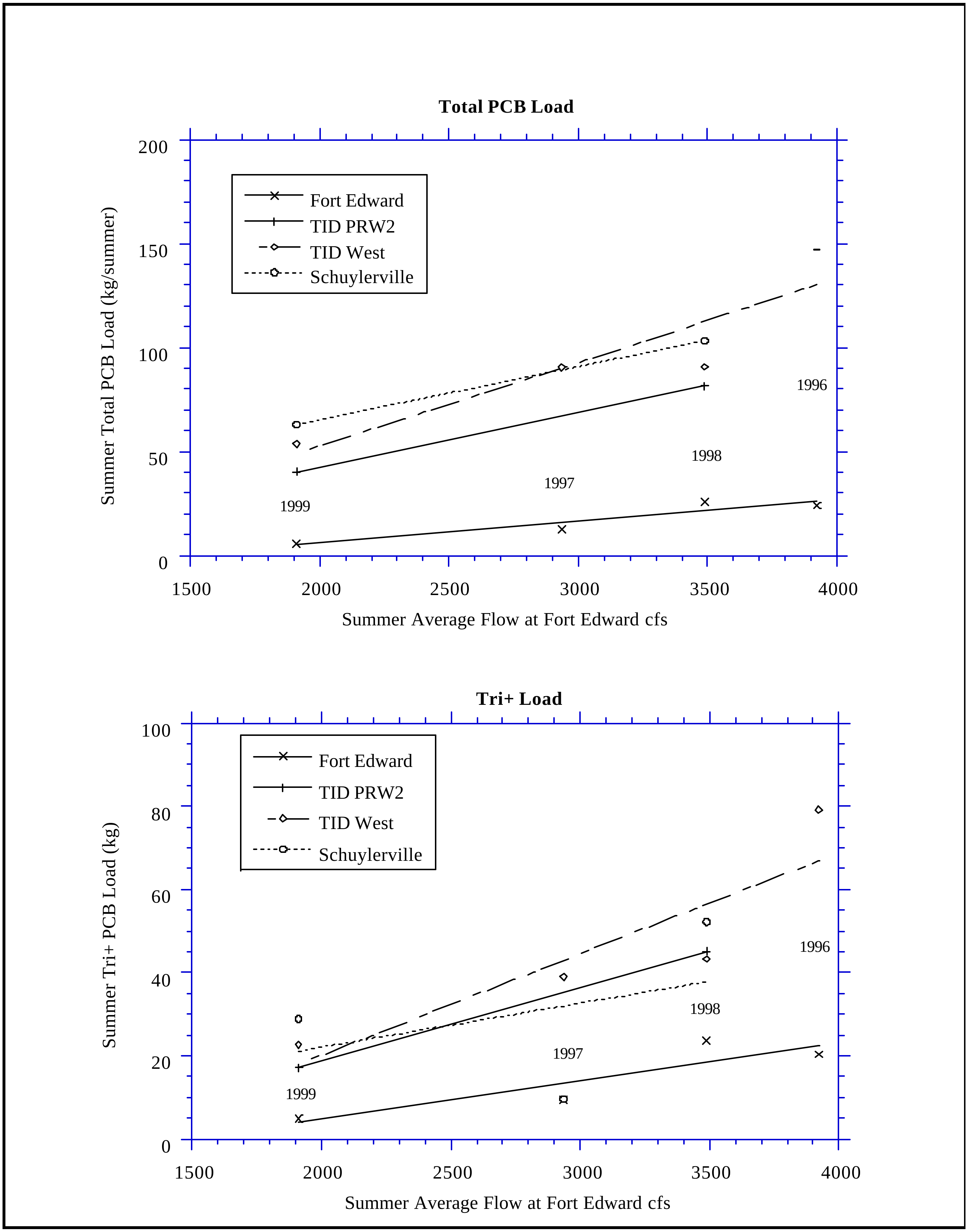


Figure 10.
Summer Water Column Load versus Flow in the Upper Hudson 1996-1999 (Ratio Estimator)

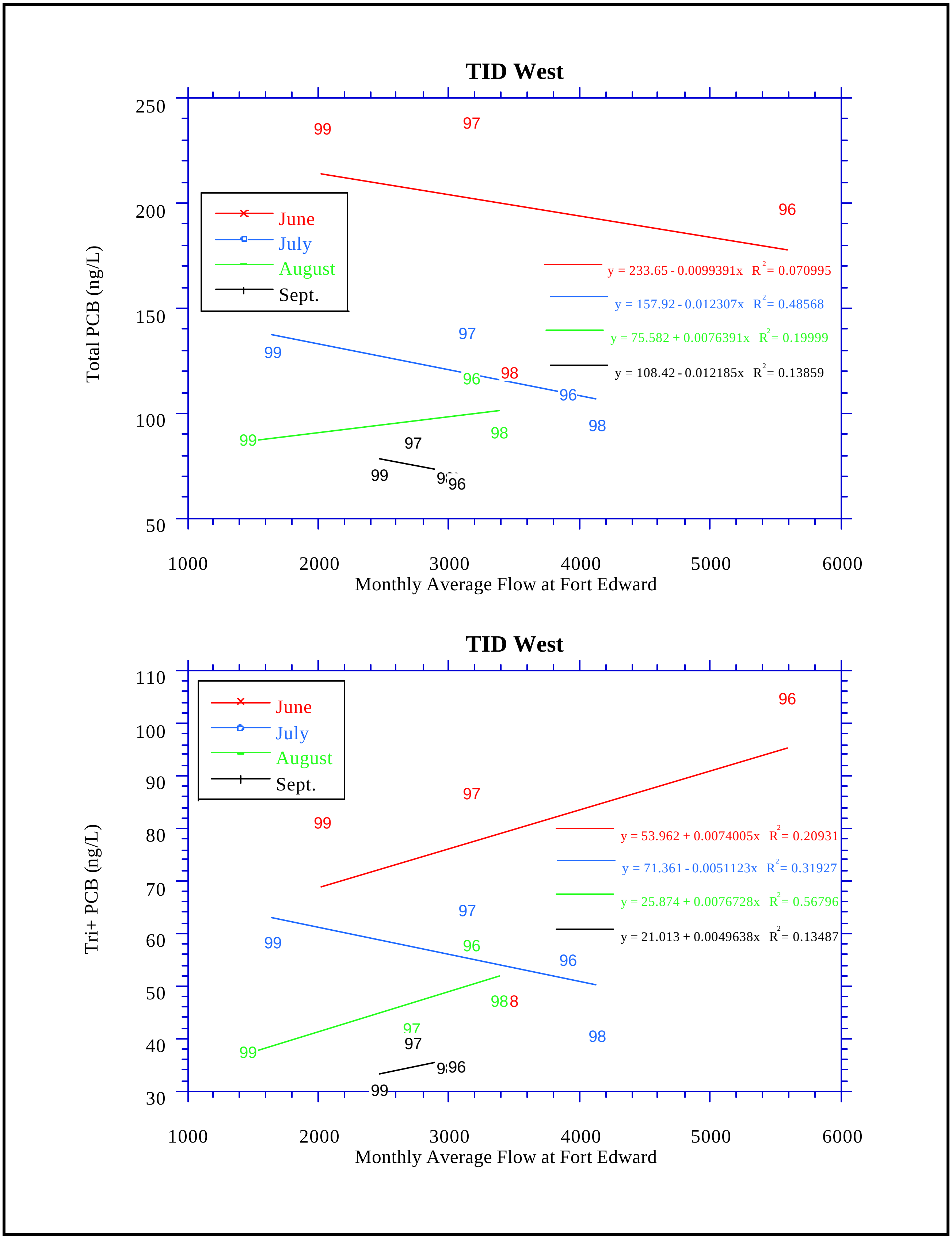
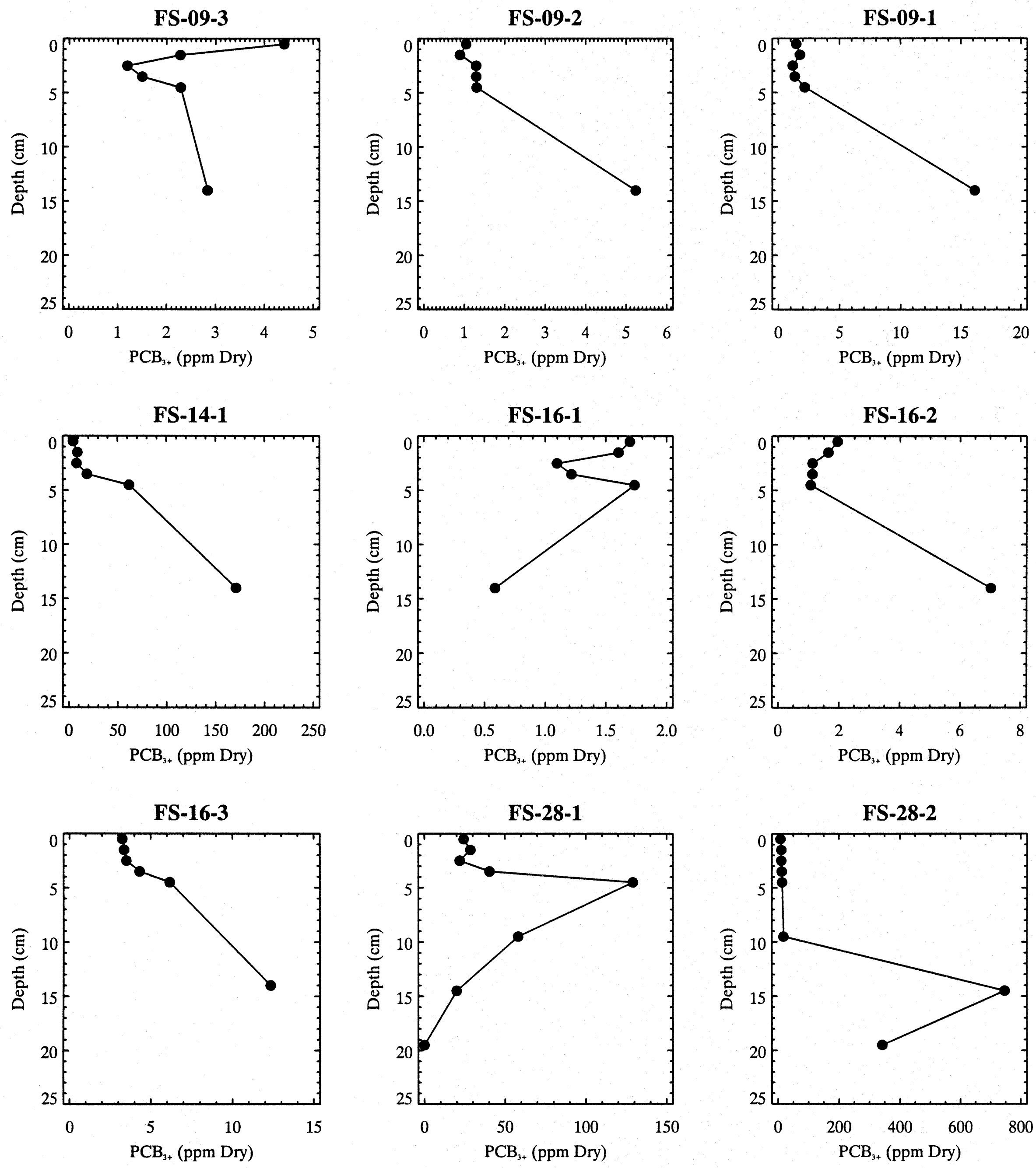


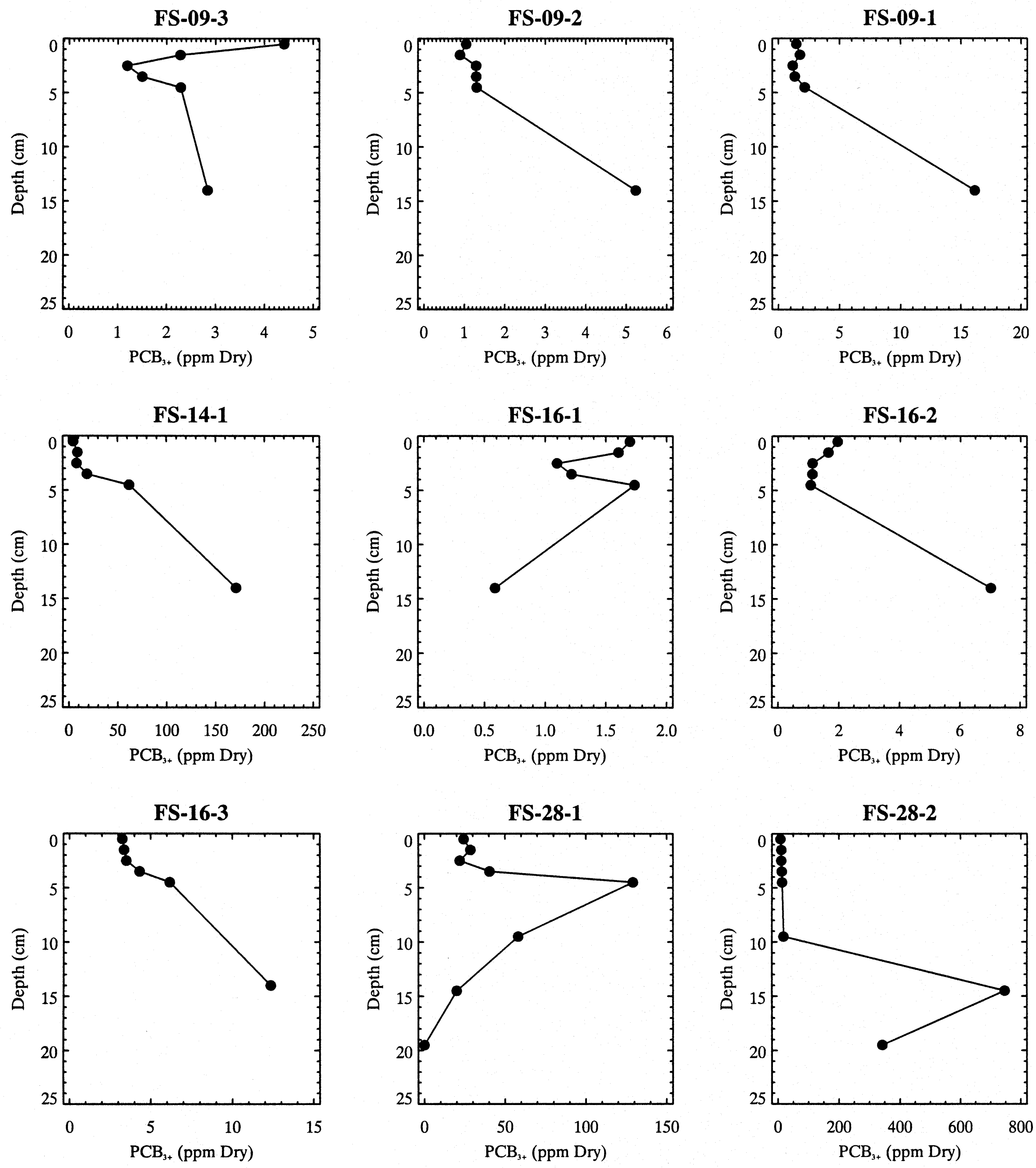
Figure 11.
Summer Water Column Concentration at TID West versus Monthly Average Flow at Fort Edward 1996 - 1999 (Ratio Estimator)



Note: Core sections shown are the top 23 cm of each core, plotted at segment midpoint.

Figure 12a.

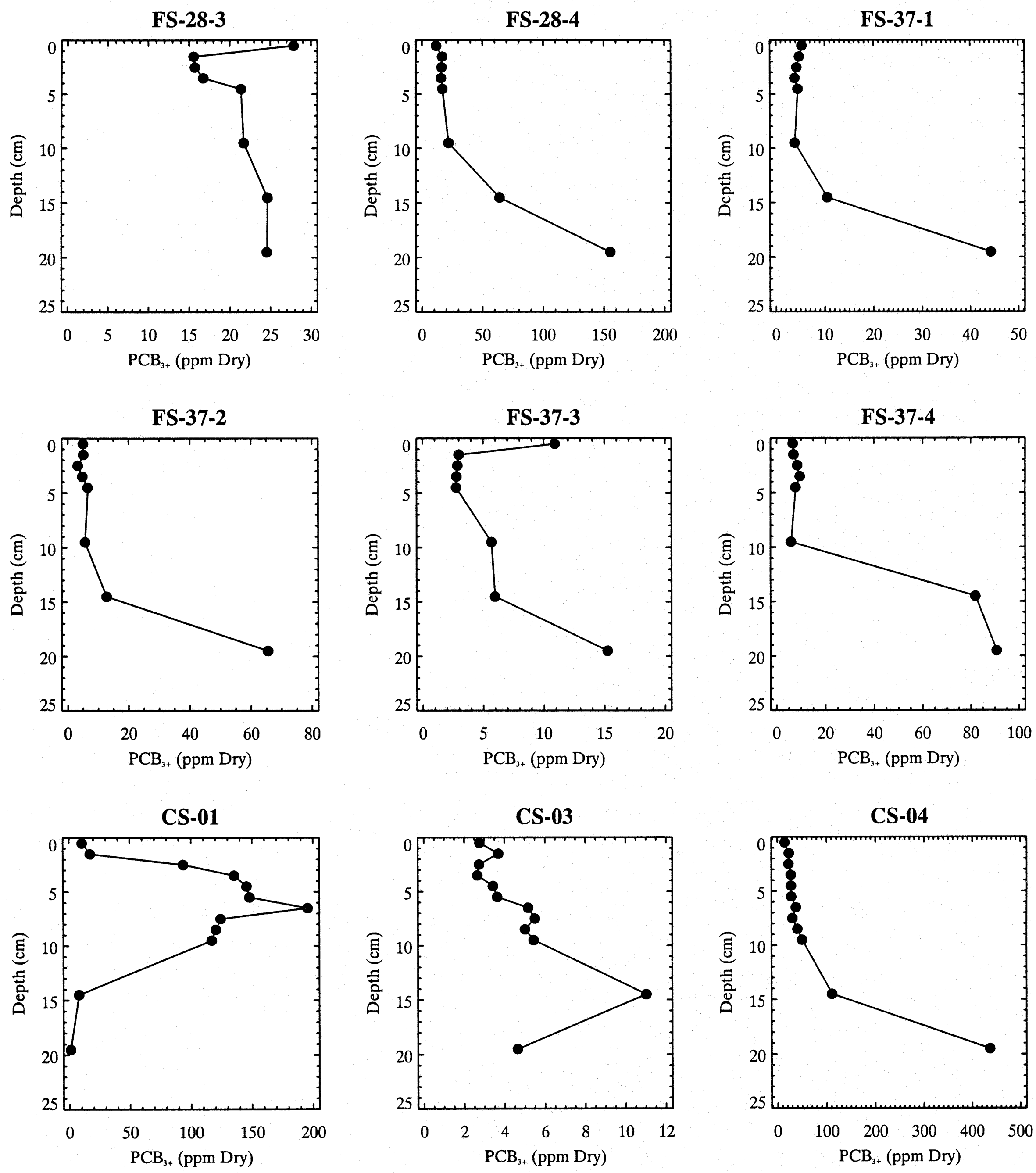
Vertical Profiles of PCB_{3+} within Finely Segmented Sediment Cores Collected from the Upper Hudson River (from QEA, 1999).



Note: Core sections shown are the top 23 cm of each core, plotted at segment midpoint.

Figure 12b.

Vertical Profiles of PCB_{3+} within Finely Segmented Sediment Cores Collected from the Upper Hudson River (from QEA, 1999).



Note: Core sections shown are the top 23 cm of each core, plotted at segment midpoint.

Figure 12c.
Vertical Profiles of PCB_{3+} within Finely Segmented Sediment Cores Collected from the Upper Hudson River (from QEA, 1999).

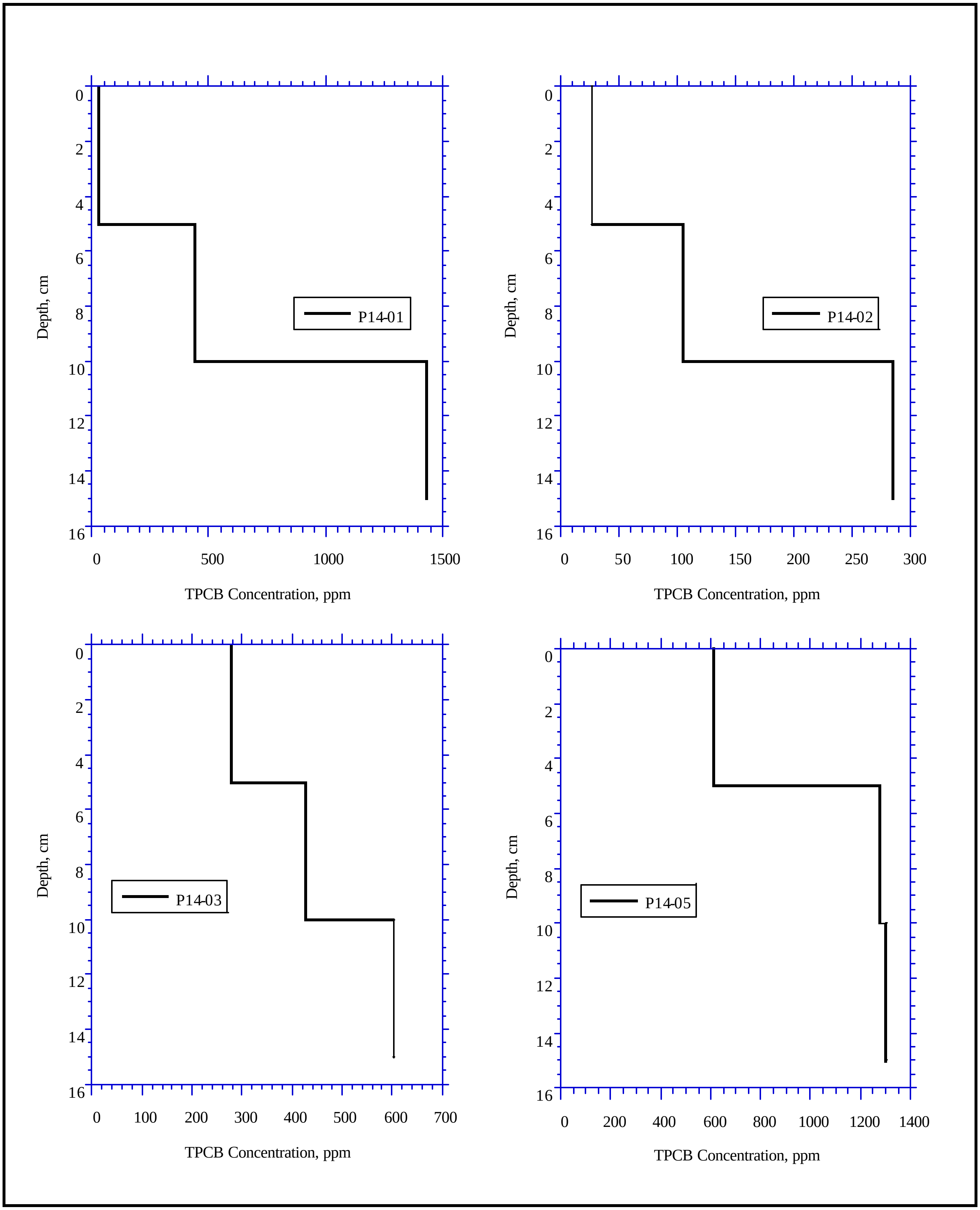


Figure 13a.
Total PCB Profiles from GE 1999 "P" Sediment Samples
(1 of 4)

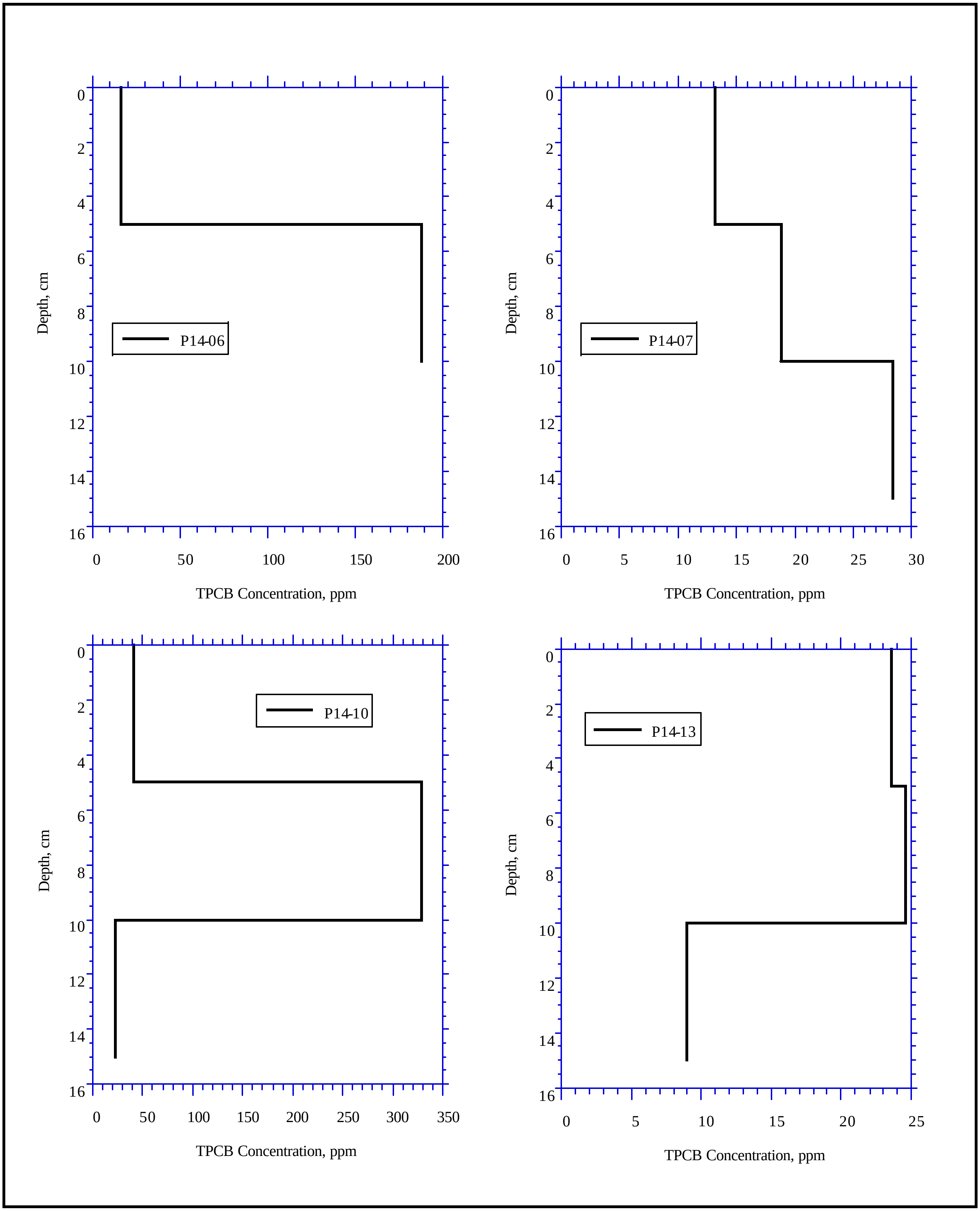


Figure 13b.
Total PCB Profiles from GE 1999 "P" Sediment Samples
(2 of 4)

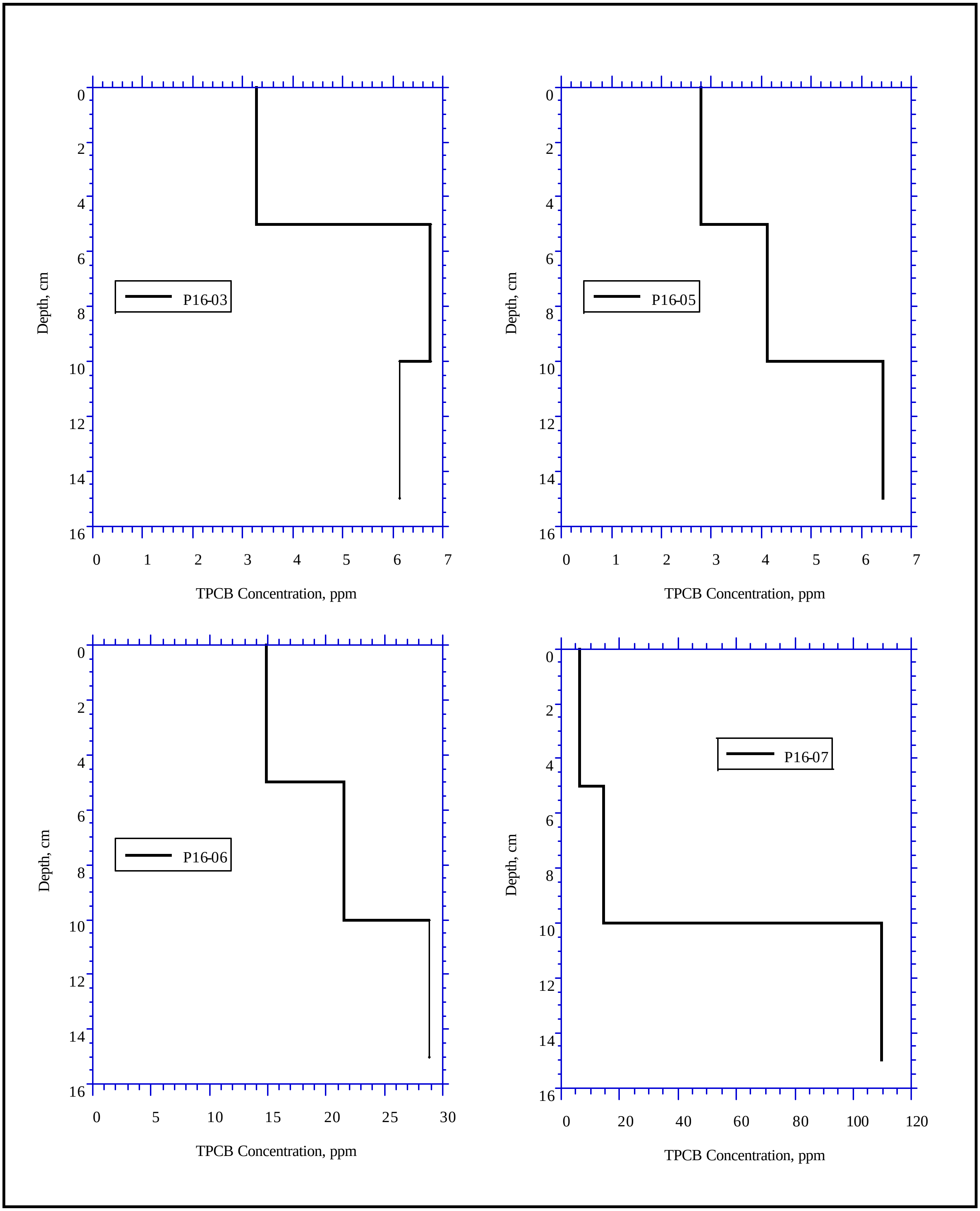


Figure 13c.
Total PCB Profiles from GE 1999 "P" Sediment Samples
(3 of 4)

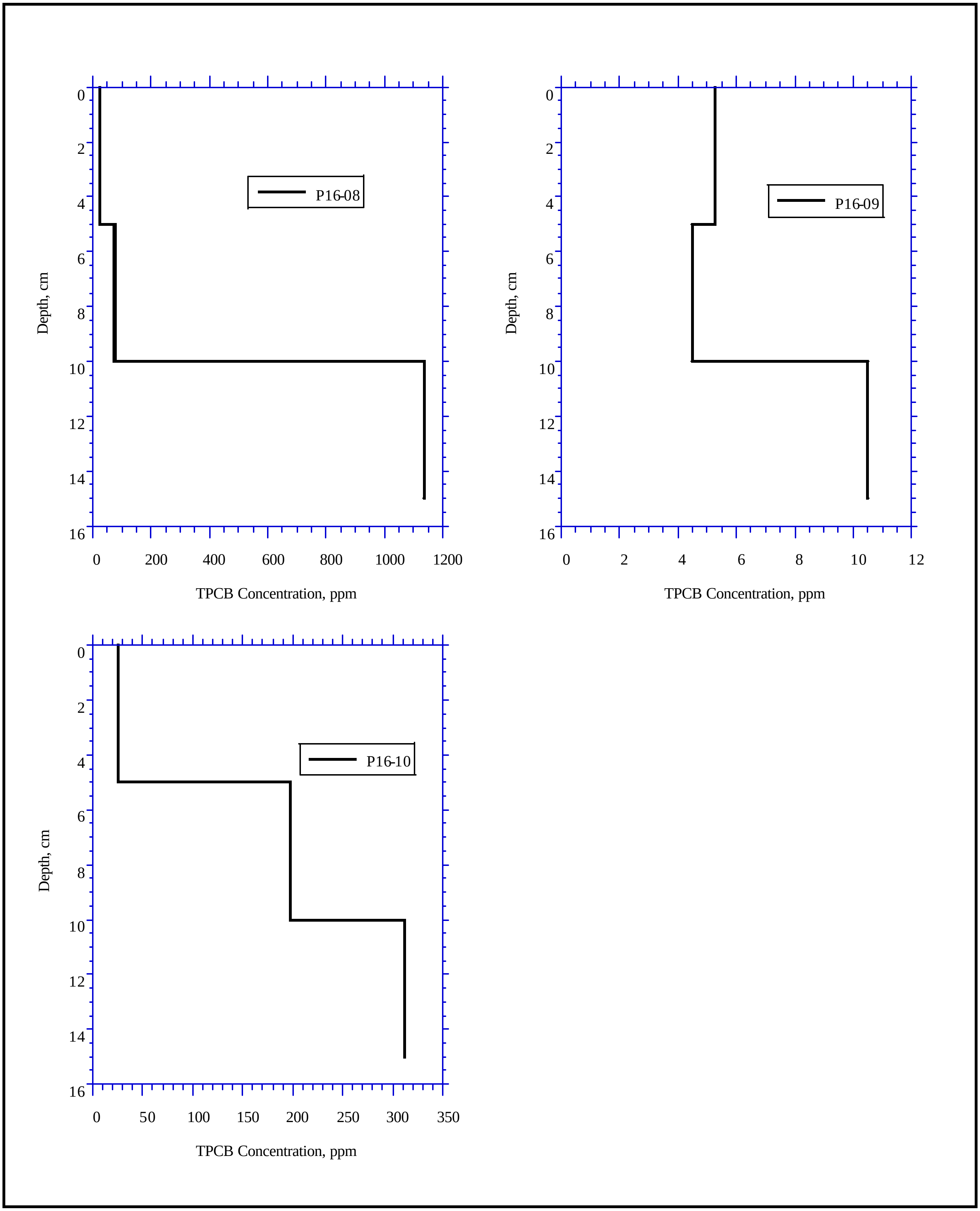
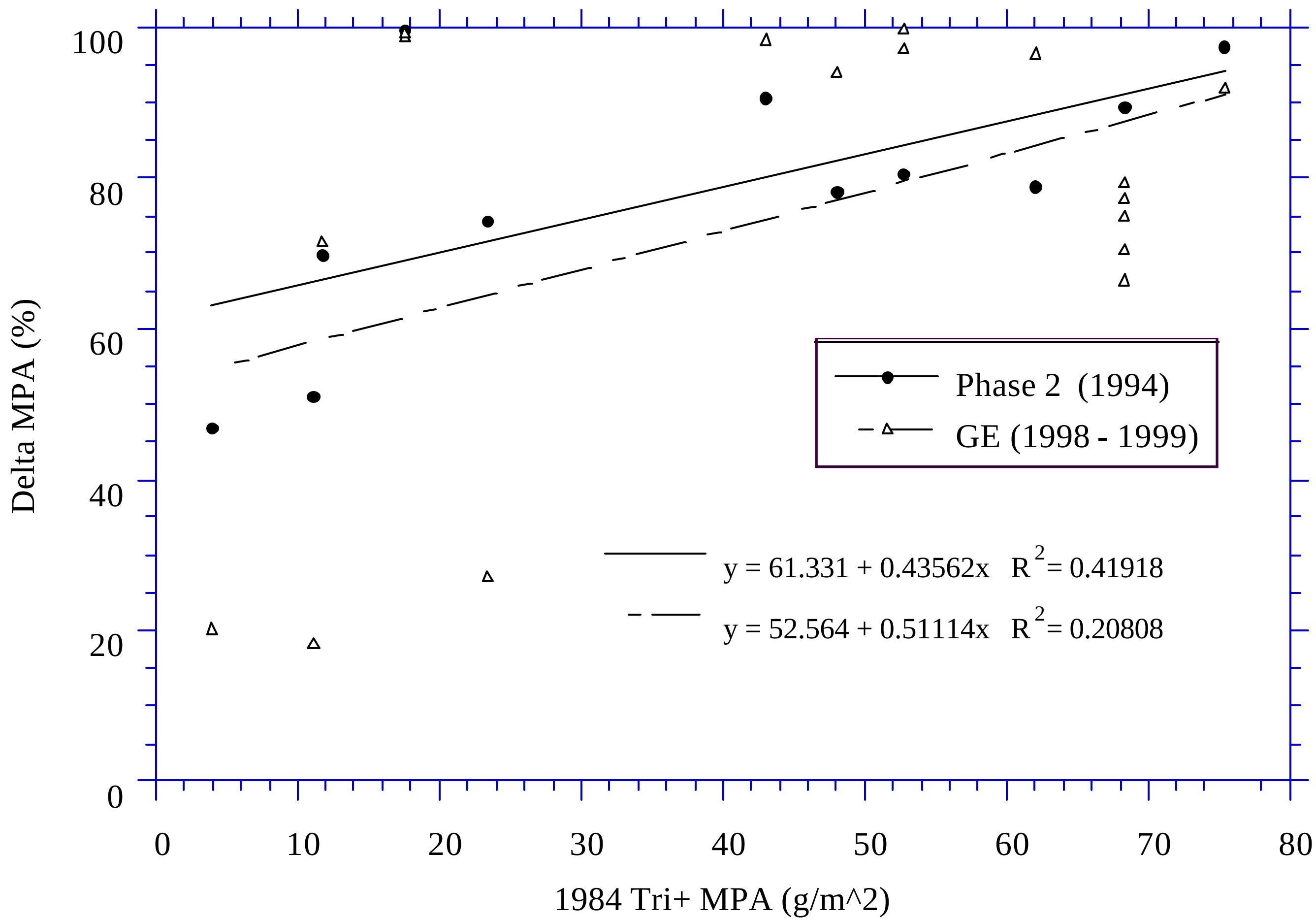


Figure 13d.
Total PCB Profiles from GE 1999 "P" Sediment Samples
(4 of 4)



Note:
Delta MPA is equal to:
(1984 Tri+ MPA - Phase 2 or GE Tri+ MPA) / 1984 Tri+ MPA
Positive values represents PCB loss from sediment.

Figure 14.
Mass Per Unit Area Changes in 1984 Sediment PCB Tri+ Inventory Based on Phase 2 and GE Samples

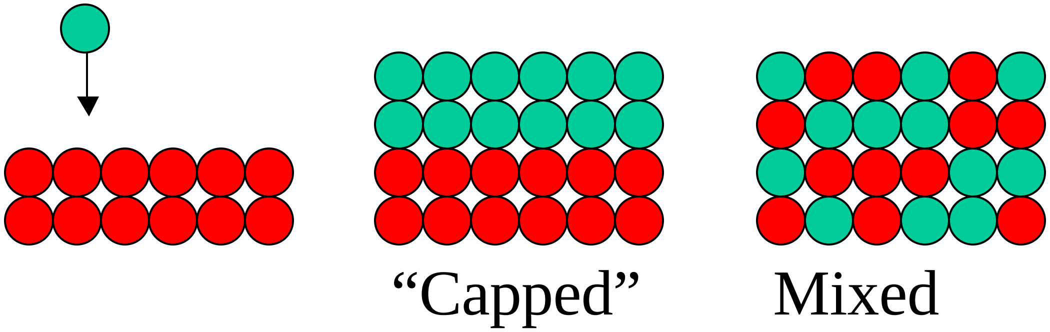


Figure 15. Sediment Deposition: Schematic of Capping versus Mixing

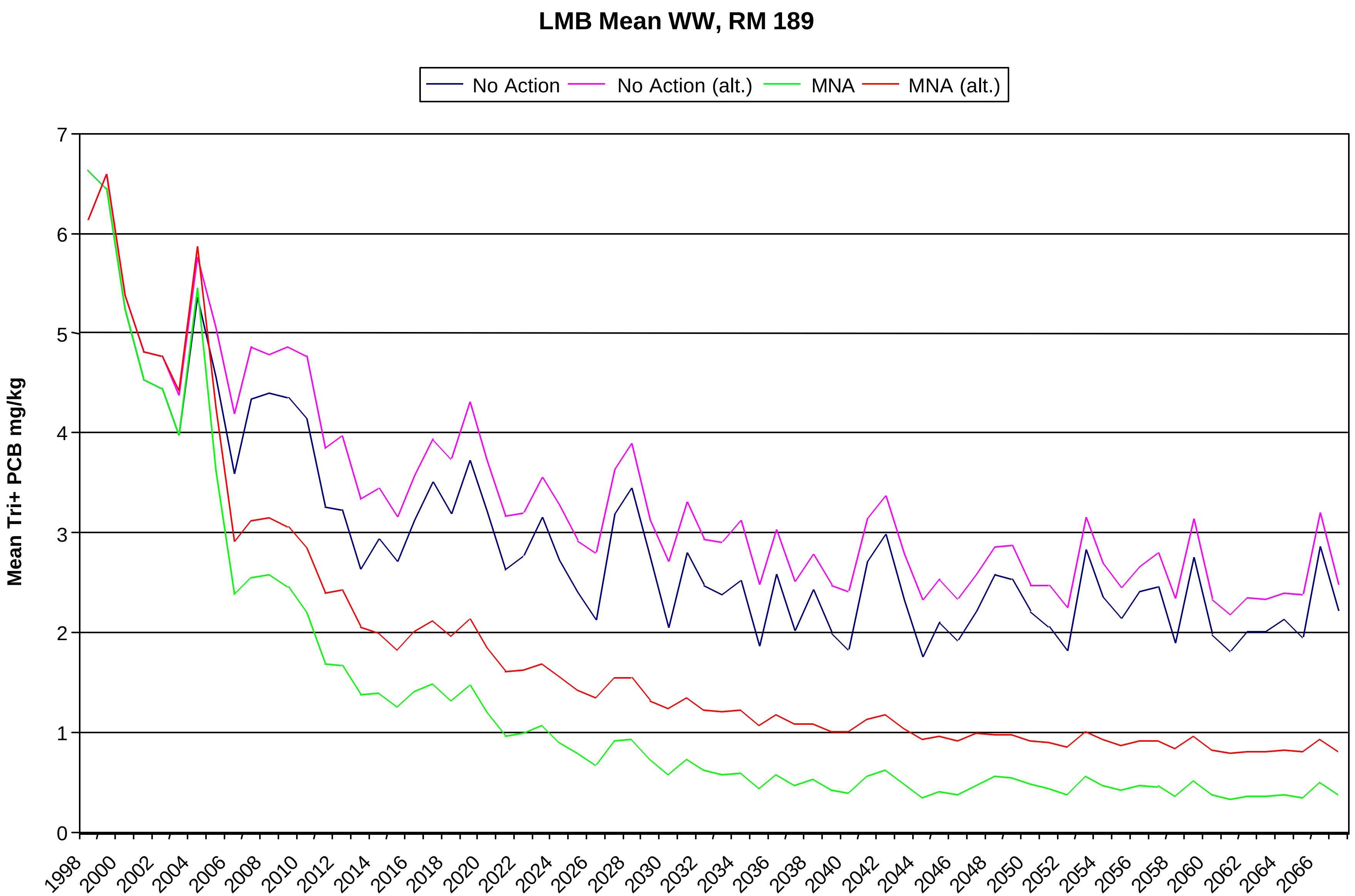


Figure 16. Bounding Forecast for Wet Weight PCB Concentrations in Largemouth Bass at RM 189

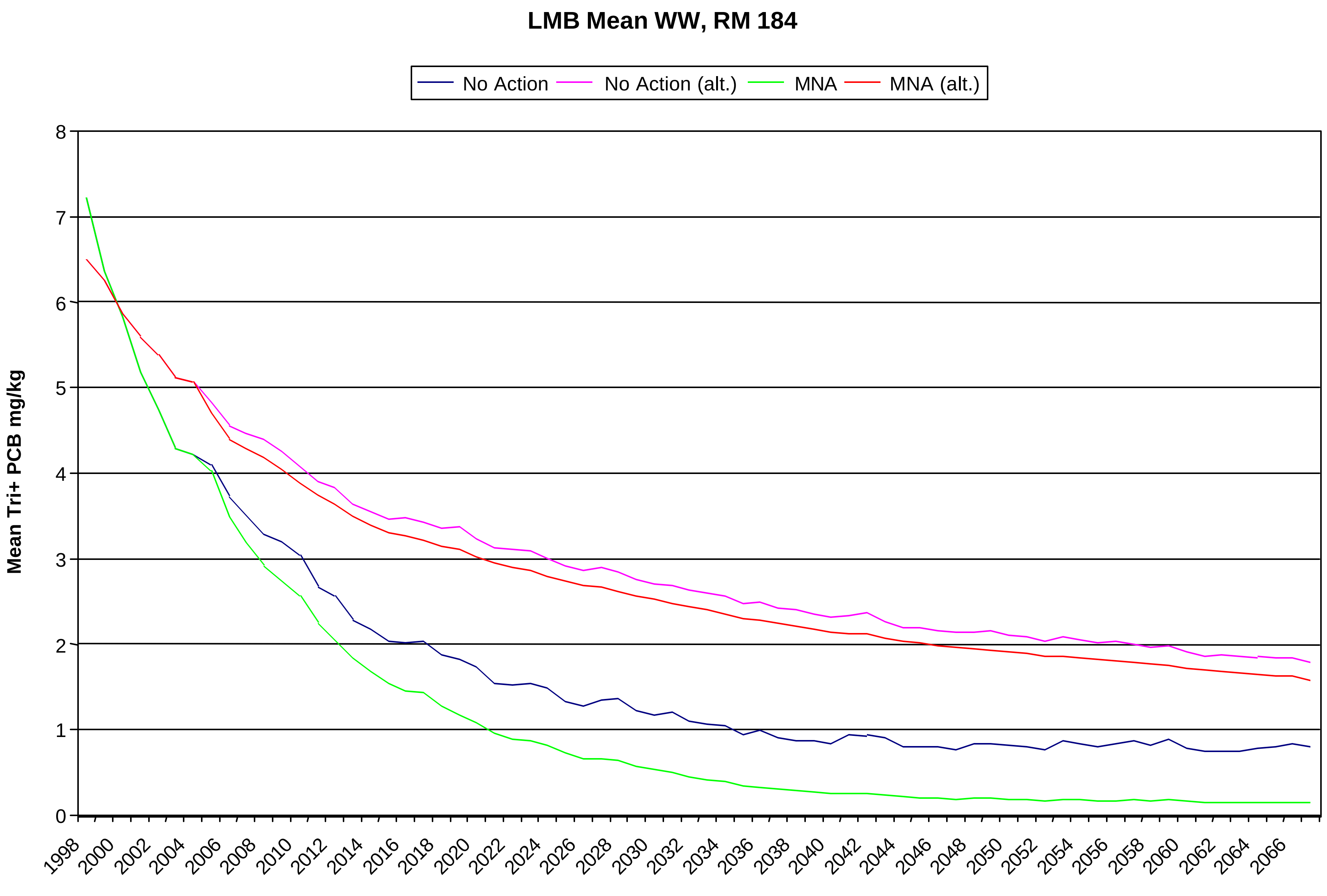


Figure 17. Bounding Forecast for Wet Weight PCB Concentrations in Largemouth Bass at RM 184

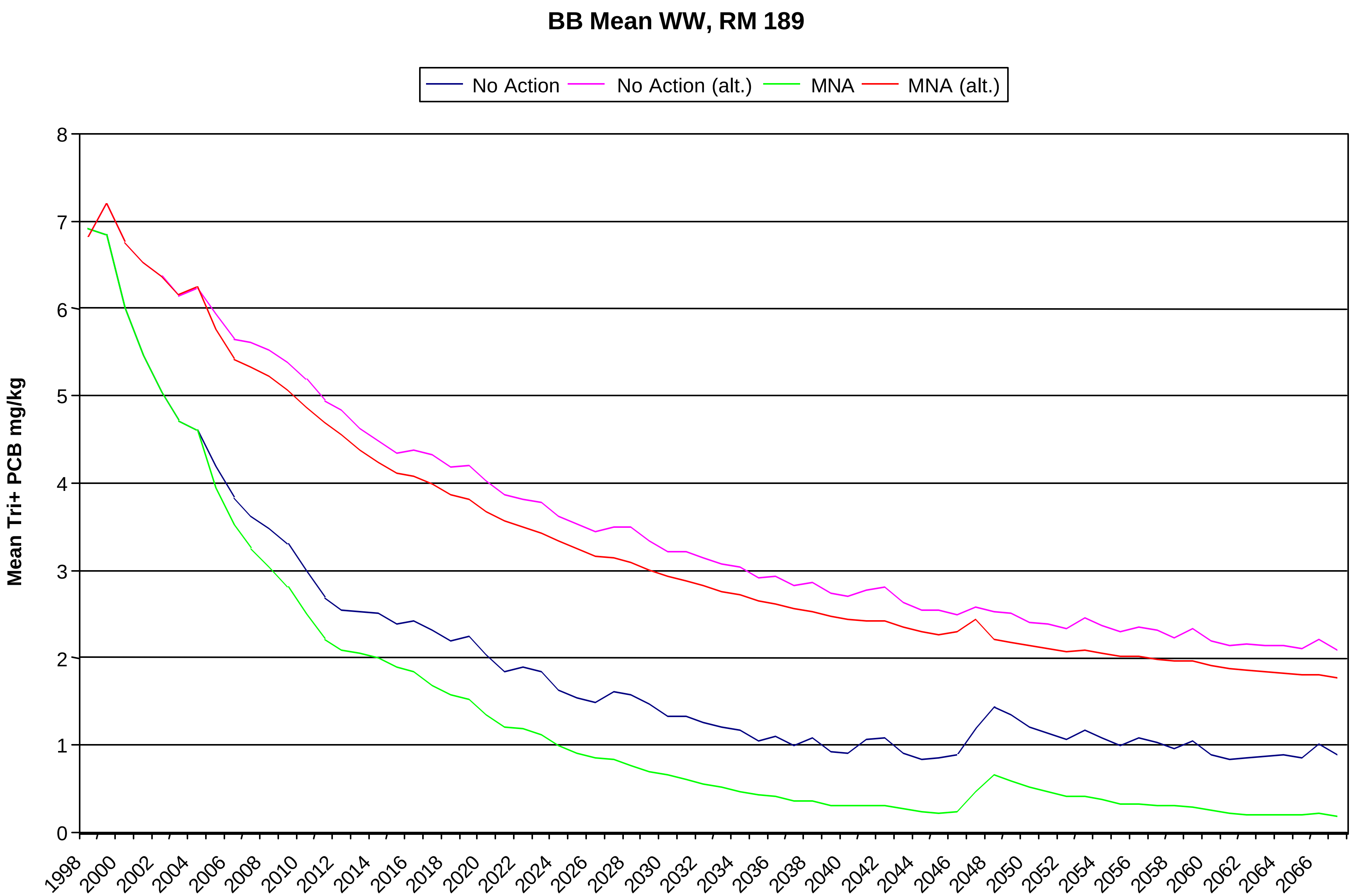


Figure 18. Bounding Forecast for Wet Weight PCB Concentrations in Brown Bullhead at RM 189

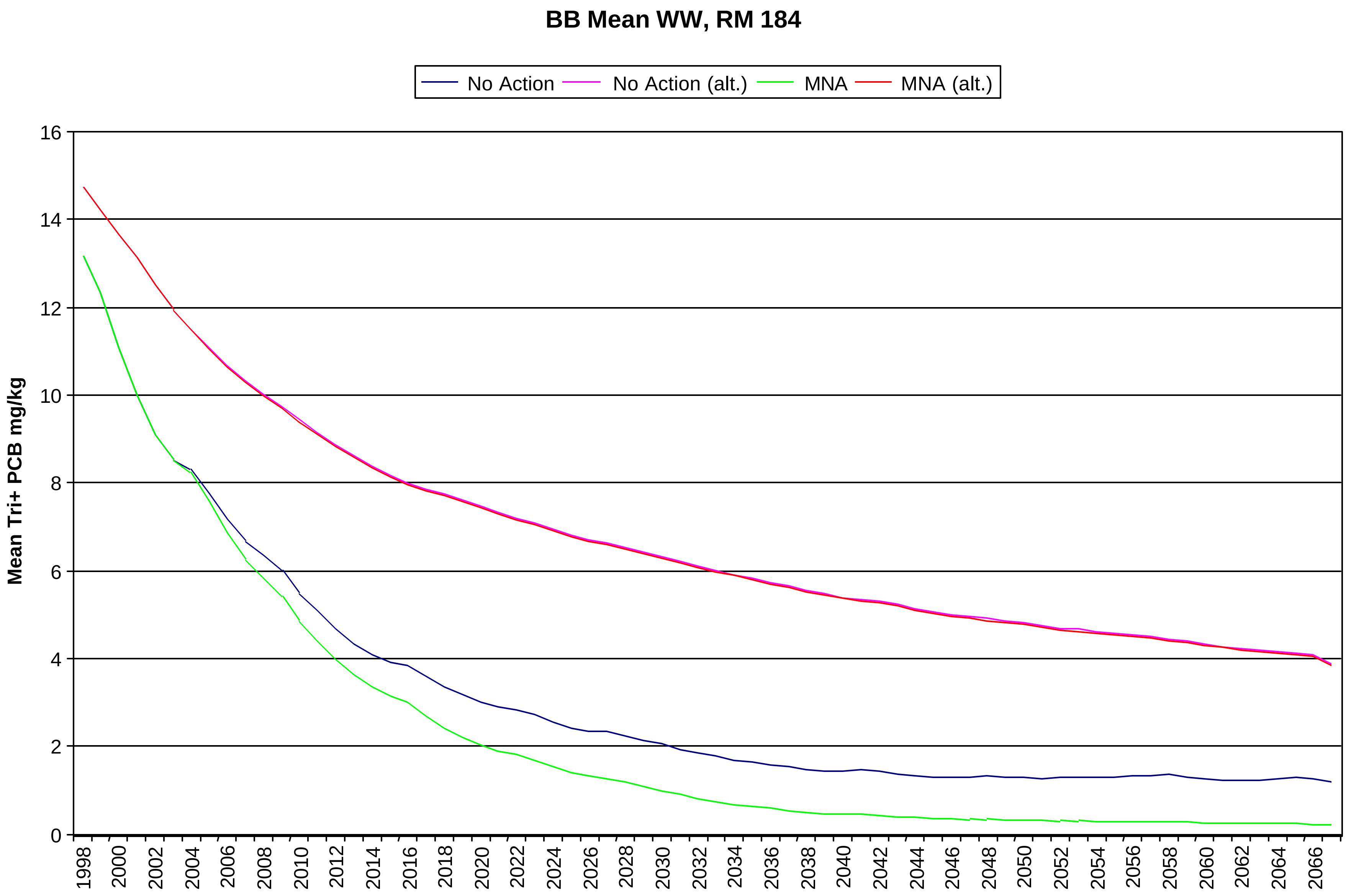


Figure 19. Bounding Forecast for Wet Weight PCB Concentrations in Brown Bullhead at RM 184

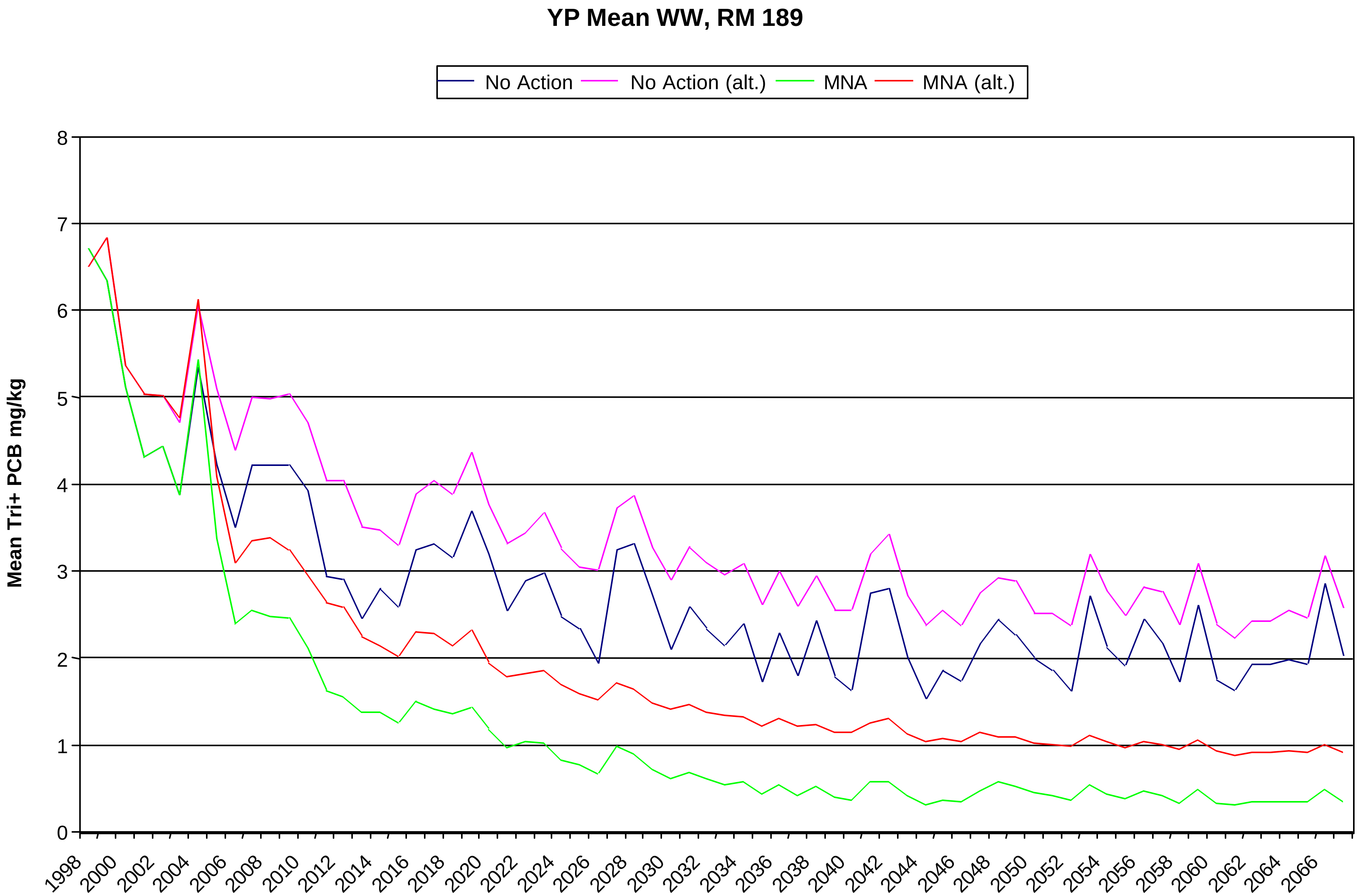


Figure 20. Bounding Forecast for Wet Weight PCB Concentrations in Yellow Perch at RM 189

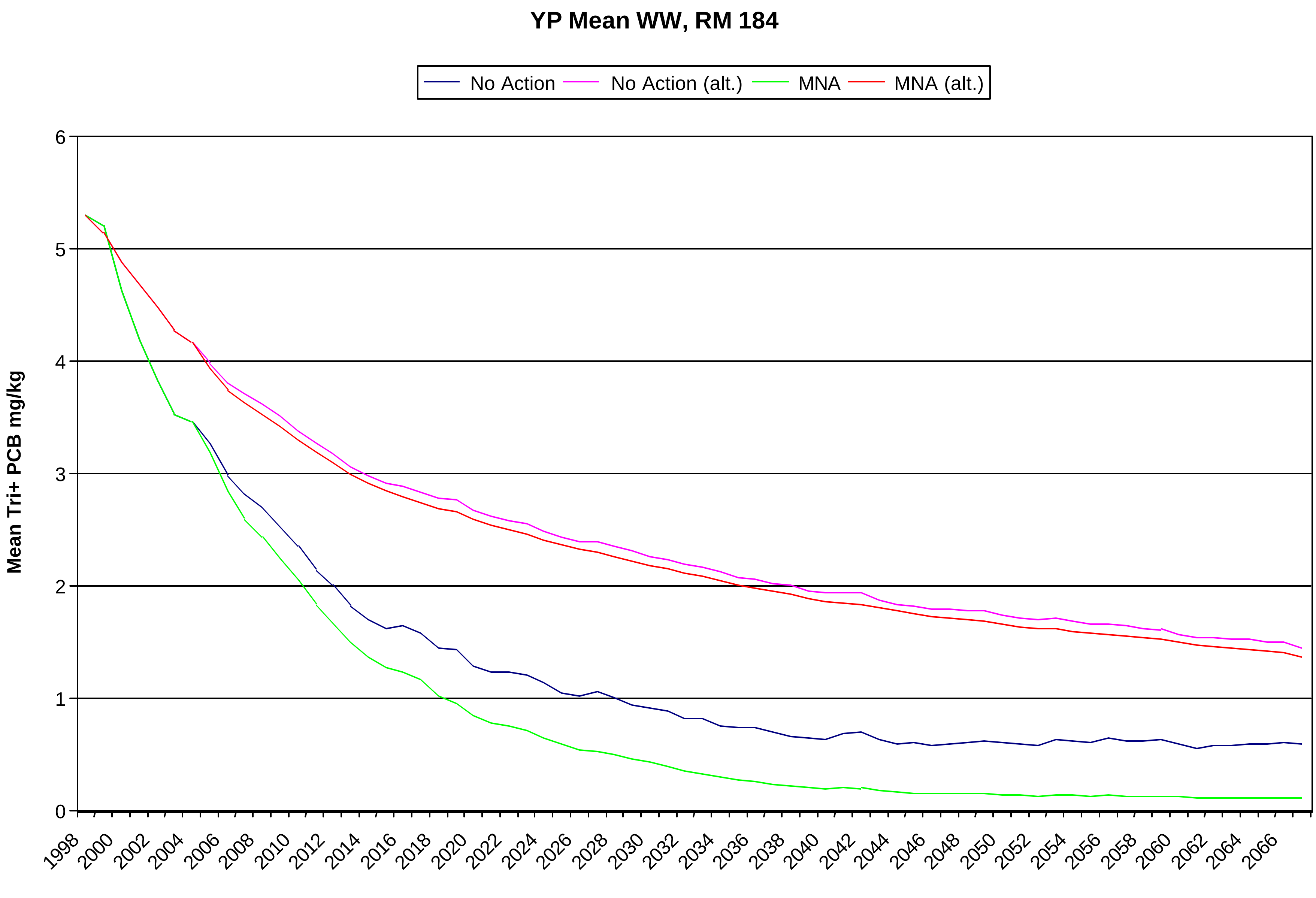


Figure 21. Bounding Forecast for Wet Weight PCB Concentrations in Yellow Perch at RM 184

HUDSON RIVER PCBS REASSESSMENT FS

APPENDIX D

MODEL INTERPRETATION, SPECIFICATIONS AND RESULTS

D.2 Model Input Specifications

HUDSON RIVER PCBs REASSESSMENT FS
Preliminary Modeling Scenarios Input Specifications

General

All scenario input is based on the 1977 NYSDEC sample data set. Although the HUDTOX model is initialized using the 1991 data set, the 1977 data set provides better coverage (more sampling locations) and, as such, was considered to be a better data set for evaluating remedial scenarios.

LTI used averaging groups (which encompass more than one sediment segment) to calculate initial conditions for the sediment segments. An averaging group was used to compensate for a limited number of samples and to smooth out the effects of spatial heterogeneity. Data points within an averaging group were averaged to establish average conditions for each of the segments within the averaging group. Therefore, all sediment segments within an averaging group have identical initial concentrations.

LTI provided the 1977 NYSDEC sample data set used to calculate initial conditions for the HUDTOX model. The data for a given sampling location was provided at 2 cm depth intervals to a total depth of 26 cm (13 intervals or slices). Note that grab samples were assumed to represent the 0 to 13 cm interval. Therefore, no data was provided for the grab samples below a depth of 13 cm. Corresponding intervals or slices were averaged for all points within a given averaging group to develop an average core profile considered representative of all sediment segments within the averaging group. Grab samples were not included in the calculation of the average profile below 13 cm since no data was available for these samples below 13 cm.

Data manipulation was altered for Scenarios 11 and 12 as compared to that performed for Scenarios 1 through 10. Specifically, for Scenarios 11 and 12, points removed due to dredging or capping are considered to have a concentration of 0 mg/kg. These 0 values are then used in calculating the average post-remediation conditions for a segment or averaging group. In contrast, for Scenarios 1 through 10, points removed due to dredging were eliminated from the data set; post-remediation average conditions were calculated using only the remaining data points. The type of analysis performed for Scenarios 1 through 10 did not provide meaningful results for the Scenarios 11 and 12 scenarios since for Scenarios 11 and 12, in general, involve removal of lesser contaminated points (dredging and capping activities were in deeper parts of the river and, therefore, likely impact the more coarse-grained sediments within a segment; PCBs tend to be more concentrated in the fine-grained sediments). Therefore, by removing the lesser contaminated points from the data set for a given segment or averaging group, the calculated post-remediation concentrations for the segment or averaging group tended to be greater than the initial condition concentrations. This difference in data manipulation must be considered in comparing the results from Scenarios 1 through 10 to the results from Scenarios 11 and 12.

The data provided to LTI for each of the preliminary scenarios are presented in Table 1.

Scenario 1

All sediment is dredged (bank to bank) from Rogers Island to Thompson Island Dam; cohesive sediment is dredged between Thompson Island Dam and Lock 5; and target areas (cohesive and non-cohesive) are dredged between Lock 5 and Federal Dam. The upstream loading for this scenario is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 1 mg/kg in the top 10 cm of sediment and 0 mg/kg at greater depth.

Calculation of Percent Mass Removed Associated with Dredging

Between Rogers Island and Thompson Island Dam, 100 percent of the PCB mass within each sediment segment is removed.

Between Thompson Island Dam and Lock 5, 100 percent of the PCB mass within the cohesive sediment segments is removed. 0 percent of the PCB mass is removed from the non-cohesive sediment segments.

Below Lock 5, sediment (cohesive and non-cohesive) exceeding the threshold Tri+ PCB concentration of 10 grams per square meter is removed. This concentration was selected as a threshold concentration based upon review of the distribution of the 1977 data set for the entire upper river as well as the portion of the river below Lock 5. Removal of this sediment was simulated for input to the HUDTOX model as follows:

Initial average mass per unit area conditions were calculated for a given segment by averaging the mass per unit area of each point (on a slice by slice basis) within the corresponding averaging group; this assumes that each point contributes equally to the initial conditions of the averaging group - none is more heavily weighted than the others. The average mass per unit area was then re-calculated for the averaging group (assuming removal of those points which exceed the 10 grams/square meter threshold concentration) by averaging the mass per unit area of each remaining point (on a slice by slice basis). One minus the ratio of the re-calculated mass per unit area to the initial condition mass per unit area represents the percent mass removed for the averaging group due to dredging. This calculated percent mass removed is assumed to be representative of each of the sediment segments within the averaging group.

Data Provided to LTI

For each sediment segment, a percent mass removed associated with the dredging was provided. It was assumed that the residual sediment concentration within the dredged areas is 1 mg/kg in the top 10 cm of sediment and 0 mg/kg at greater depth.

Scenario 2

Same as Scenario 1 except the upstream loading is assumed to be 0 ng/L.

Scenario 3

All sediment is dredged (bank to bank) from Rogers Island to Thompson Island Dam. The upstream loading for this scenario is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 1 mg/kg in the top 10 cm of sediment and 0 mg/kg at greater depth.

Calculation of Percent Mass per Unit Area Removed Associated with Dredging

Between Rogers Island and Thompson Island Dam, 100 percent of the PCB mass within each sediment segment is assumed to be removed.

Data Provided to LTI

For each sediment segment between Rogers Island and Thompson Island Dam, 100 percent of the contaminant mass was assumed to be removed. It was assumed that the residual sediment concentration within the dredged areas is 1 mg/kg in the top 10 cm of sediment and 0 mg/kg at greater depth.

Scenario 4

Same as Scenario 3 except the upstream loading is assumed to be 0 ng/L.

Scenario 5

All cohesive sediment is dredged between Rogers Island and Lock 5; all non-cohesive target areas are dredged between Rogers Island and Lock 5; and all target areas (cohesive and non-cohesive) are dredged between Lock 5 and Federal Dam. The upstream loading for this scenario is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 1 mg/kg in the top 10 cm of sediment and 0 mg/kg at greater depth.

Calculation of Percent Mass Removed Associated with Dredging

Between Rogers Island and Thompson Island Dam, 100 percent of the PCB mass within the cohesive sediment segments is removed. Non-cohesive sediment exceeding the threshold concentration of 10 grams per square meter is removed. Removal of this non-cohesive sediment was simulated for input to the HUDTOX model as described above for the river reach below Lock 5 for Scenario 1.

Between Thompson Island Dam and Lock 5, 100 percent of the PCB mass within the cohesive sediment segments is removed. Non-cohesive sediment exceeding the threshold concentration of 10 grams per square meter is removed. Removal of this non-cohesive sediment was simulated for input to the HUDTOX model as described above for the river reach below Lock 5 for Scenario 1.

Below Lock 5, cohesive and non-cohesive sediment exceeding the threshold concentration of 10 grams per square meter is removed. Removal of sediment from these target areas was simulated for input to the HUDTOX model as described above for the river reach below Lock 5 for Scenario 1.

Data Provided to LTI

For each sediment segment, a percent mass removed associated with the dredging was provided. It was assumed that the residual sediment concentration within the dredged areas is 1 mg/kg in the top 10 cm of sediment and 0 mg/kg at greater depth.

Scenario 6

Same as Scenario 7 except an upstream loading of 0 ng/L is assumed.

Scenario 7

All sediment is dredged (bank to bank) from Rogers Island to Lock 5; and target areas (cohesive and non-cohesive) are dredged between Lock 5 and Federal Dam. The upstream loading for this scenario is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 1 mg/kg in the top 10 cm of sediment and 0 mg/kg at greater depth.

<u>Calculation of Percent Mass Removed Associated with Dredging</u>

Between Rogers Island and Lock 5, 100 percent of the Tri+ PCB mass within each sediment segment is removed.

Below Lock 5, sediment (cohesive and non-cohesive) exceeding the threshold Tri+ PCB concentration of 10 grams per square meter is removed. Removal of this target area sediment was simulated for input to the HUDTOX model as described above for the river reach below Lock 5 for Scenario 1.

<u>Data Provided to LTI</u>

For each sediment segment, a percent mass removed associated with the dredging was provided. It was assumed that the residual sediment concentration within the dredged areas is 1 mg/kg in the top 10 cm of sediment and 0 mg/kg at greater depth.

Scenario 8

Same as Scenario 7 except an upstream loading of 0 ng/L is assumed.

Scenario 9

Same as Scenario 7 except a residual sediment concentration of 0.1 mg/kg is assumed for the top 10 cm of sediment within the dredged areas and 0 mg/kg at greater depth.

Scenario 10

Same as Scenario 9 except assume upstream loading of 0 ng/L.

Scenario 11

Scenario 11 consists of three parts. For each part, an upstream loading of 10 ng/L is assumed.

1. Capping and Dredging between Rogers Island and Thompson Island Dam

All sediment associated with water depths greater than 6 feet and less than 12 feet will be capped. The 12-foot water depth contour is assumed to represent the edge of the navigation channel. Sediment within the navigation channel will be dredged.

All sediment associated with water depths greater than 6 feet will be capped in that portion of the river in which the navigation channel is located within a land cut adjacent to the river.

To simulate this action for input into the HUDTOX model:

Calculation of Percent Mass Removed Associated with Capping

Within a given segment or averaging group, all points (cohesive and non-cohesive) within the area to be capped will be removed from the total number of sampling points within the segment or averaging group. The average conditions for the segment or averaging group will be re-calculated assuming the removed points have a mass per unit area contribution of 0 grams per square meter (this is done to keep the initial condition area associated with each sample point constant throughout the analysis). The ratio of the re-calculated mass per unit area to the initial condition mass per unit area represents the percent mass remaining. One minus this ratio represents the percent mass removed. For modeling purposes, it is assumed that the cap is ideal. Therefore, no leakage from the cap will occur and the residual concentration in the capped areas will be 0 mg/kg.

In the cases where an averaging group encompasses more than one sediment segment, the percent mass removed will be the same for each segment within the averaging group.

Calculation of Percent Mass Removed Associated with Dredging:

Within a given segment or averaging group, all points (cohesive and non-cohesive) within the area to be dredged will be removed from the total number of sampling points within the segment or averaging group. The percent mass per unit area that these removed sampling points represents will be calculated as described above for the estimation of mass removed due to capping. For modeling purposes, it is assumed that the residual sediment concentration in the dredged areas will be 1 mg/kg.

In the cases where an averaging group encompasses more than one sediment segment, the percent mass removed will be the same for each segment within the averaging group.

Data Provided to LTI

For each segment, a total percent mass removed associated with dredging and capping will be calculated. It is assumed that the residual sediment concentration in the capped areas will be 0 mg/Kg and the residual sediment concentration in the dredged area will be 1 mg/kg. A weighted average residual sediment concentration will be calculated for the combined capped and dredged area based on the relative contribution of each area (derived from bathymetric data) to the total treated (capped or dredged) area. The data provided to LTI will be the total percent mass removed (capped and dredged) within a given sediment segment and the corresponding weighted residual sediment concentration in the capped/dredged area.

2. Capping and Dredging between Thompson Island Dam and Northumberland Dam

All sediment associated with water depths greater than 6 feet and less than 12 feet will be capped. The 12-foot water depth contour is assumed to represent the edge of the navigation channel. Sediment within the navigation channel will be dredged.

All sediment associated with water depths greater than 6 feet will be capped in that portion of the river in which the navigation channel is located within a land cut adjacent to the river (i.e., from the Thompson Island Dam to just below Lock 6).

To simulate these actions for input into the HUDTOX model: Same as described above.

Note: the Northumberland Dam is used as a lower boundary for this river segment instead of Lock 5 since the bathymetric data is only available to the Northumberland Dam (bathymetric data between the Northumberland Dam and Lock 5 is within the land cut navigation channel adjacent to the river.

3. Capping and Dredging between the Northumberland Dam and Federal Dam

Because no bathymetric data is available between the Northumberland Dam and Federal Dam, the dredging and capping analysis applied above the Northumberland Dam can not be conducted. Instead, it is assumed that all portions of the river below the Northumberland Dam will be capped in those areas in which the sediment concentrations equals or exceeds 10 grams/m^2. No channel dredging is assumed.

Calculation of Percent Mass Removed Associated with Capping

Within a given segment or averaging group, all points with a sediment mass per unit area equal to or greater than 10 grams/m^2 will be removed from the total number of sampling points within the segment or averaging group. The average conditions for the segment or averaging group will be re-calculated assuming the removed points have a mass per unit area contribution of 0 grams per square meter (this is done to keep the initial condition area associated with each sample point constant throughout the analysis). The ratio of the re-calculated mass per unit area to the initial condition mass per unit area represents the percent mass remaining. One minus this ratio represents the percent mass removed. For modeling purposes, it is assumed that the cap is ideal. Therefore, no leakage from the cap will occur and the residual concentration in the capped areas will be 0 mg/kg.

In the cases where an averaging group encompasses more than one sediment segment, the percent mass removed will be the same for each segment within the averaging group.

Data Provided to LTI

For each segment, a percent mass removed associated with capping will be calculated. It is assumed that the residual sediment concentration in the capped areas will be 0 mg/Kg. The data provided to LTI will be the total percent mass removed (capped) within a given sediment segment and the corresponding residual sediment concentration in the capped area of 0 mg/Kg.

Scenario 12

Same as Scenario 11 except assume an upstream loading of 0 ng/L.

Scenario 13

The description for Scenario 13 is given in the LTI memorandum, dated September 15, 1999 as the fifth simulation, Capping - Rogers Island to Federal Dam. This memorandum is attached. The other four simulations listed in this memorandum were not used in this FS report.

Table 1
HUDTOX Input as Provided to LTI For Preliminary Screening

Segment	Type	Region	Percent of PCBs Removed Scenarios 1&2	Scenarios 3&4	Scenarios 5&6	Scenarios 7 through 10	Scenarios 11&12	Scenario 13
48	N	Above TID	100.0%	100.0%	57.9%	100.0%	30.3%	0.0%
49	N	Above TID	100.0%	100.0%	57.9%	100.0%	30.3%	0.0%
50	N	Above TID	100.0%	100.0%	57.9%	100.0%	30.3%	0.0%
51	N	Above TID	100.0%	100.0%	57.9%	100.0%	30.3%	1.7%
52	C	Above TID	100.0%	100.0%	100.0%	100.0%	32.5%	11.4%
53	N	Above TID	100.0%	100.0%	57.9%	100.0%	30.3%	3.3%
54	N	Above TID	100.0%	100.0%	57.9%	100.0%	30.3%	3.1%
55	N	Above TID	100.0%	100.0%	57.9%	100.0%	30.3%	2.8%
56	C	Above TID	100.0%	100.0%	100.0%	100.0%	17.4%	4.3%
57	N	Above TID	100.0%	100.0%	58.2%	100.0%	26.1%	4.9%
58	N	Above TID	100.0%	100.0%	58.2%	100.0%	26.1%	2.5%
59	C	Above TID	100.0%	100.0%	100.0%	100.0%	17.4%	0.1%
60	N	Above TID	100.0%	100.0%	58.2%	100.0%	26.1%	0.0%
61	C	Above TID	100.0%	100.0%	100.0%	100.0%	17.4%	33.6%
62	N	Above TID	100.0%	100.0%	58.2%	100.0%	26.1%	1.0%
63	N	Above TID	100.0%	100.0%	58.2%	100.0%	26.1%	0.3%
64	C	Above TID	100.0%	100.0%	100.0%	100.0%	17.4%	0.0%
65	N	Above TID	100.0%	100.0%	58.2%	100.0%	26.1%	4.7%
66	C	Above TID	100.0%	100.0%	100.0%	100.0%	67.2%	5.4%
67	N	Above TID	100.0%	100.0%	69.5%	100.0%	20.4%	1.0%
68	C	Above TID	100.0%	100.0%	100.0%	100.0%	67.2%	4.2%
69	N	Above TID	100.0%	100.0%	69.5%	100.0%	20.4%	3.4%
70	C	Above TID	100.0%	100.0%	100.0%	100.0%	67.2%	20.2%
71	N	Above TID	100.0%	100.0%	69.5%	100.0%	20.4%	4.4%
72	C	Above TID	100.0%	100.0%	100.0%	100.0%	18.6%	25.7%
73	N	Above TID	100.0%	100.0%	50.1%	100.0%	61.7%	4.0%
74	N	Above TID	100.0%	100.0%	50.1%	100.0%	61.7%	2.4%
75	C	Above TID	100.0%	100.0%	100.0%	100.0%	18.6%	1.7%
76	N	Above TID	100.0%	100.0%	50.1%	100.0%	61.7%	0.0%
77	N	Above TID	100.0%	100.0%	52.5%	100.0%	42.6%	0.0%
78	C	Above TID	100.0%	100.0%	100.0%	100.0%	46.9%	48.0%
79	N	Above TID	100.0%	100.0%	52.5%	100.0%	42.6%	0.0%
80	C	Above TID	100.0%	100.0%	100.0%	100.0%	46.9%	31.5%
81	C	Above TID	100.0%	100.0%	100.0%	100.0%	95.5%	3.3%
82	N	Above TID	100.0%	100.0%	37.5%	100.0%	82.2%	6.3%
83	N	Above TID	100.0%	100.0%	37.5%	100.0%	82.2%	2.6%
84	C	Above TID	100.0%	100.0%	100.0%	100.0%	95.5%	23.1%
85	N	Above TID	100.0%	100.0%	37.5%	100.0%	82.2%	0.0%
86	N	Above TID	100.0%	100.0%	85.6%	100.0%	9.8%	2.3%
87	N	Above TID	100.0%	100.0%	85.6%	100.0%	9.8%	7.2%
88	C	Above TID	100.0%	100.0%	100.0%	100.0%	51.2%	7.5%
89	N	Above TID	100.0%	100.0%	85.6%	100.0%	9.8%	12.6%
90	C	TID-Lock 5	100.0%	0.0%	100.0%	100.0%	36.9%	11.2%
91	N	TID-Lock 5	0.0%	0.0%	40.6%	100.0%	45.8%	0.8%
92	C	TID-Lock 5	100.0%	0.0%	100.0%	100.0%	35.2%	6.9%

Table 1
HUDTOX Input as Provided to LTI For Preliminary Screening

Segment	Type	Region	Percent of PCBs Removed Scenarios 1&2	Scenarios 3&4	Scenarios 5&6	Scenarios 7 through 10	Scenarios 11&12	Scenario 13
93	N	TID-Lock 5	0.0%	0.0%	16.6%	100.0%	62.2%	3.5%
94	C	TID-Lock 5	100.0%	0.0%	100.0%	100.0%	23.4%	18.6%
95	N	TID-Lock 5	0.0%	0.0%	65.7%	100.0%	71.5%	0.0%
96	N	TID-Lock 5	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
97	N	Below Lock 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
98	C	Below Lock 5	41.3%	0.0%	41.3%	41.3%	49.3%	0.0%
99	N	Below Lock 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
100	C	Below Lock 5	47.3%	0.0%	47.3%	47.3%	48.2%	0.0%
101	N	Below Lock 5	30.8%	0.0%	30.8%	30.8%	33.4%	0.0%
102	C	Below Lock 5	47.3%	0.0%	47.3%	47.3%	48.2%	0.0%
103	N	Below Lock 5	30.8%	0.0%	30.8%	30.8%	33.4%	0.0%
104	C	Below Lock 5	47.3%	0.0%	47.3%	47.3%	48.2%	8.3%
105	N	Below Lock 5	30.8%	0.0%	30.8%	30.8%	33.4%	1.1%
106	C	Below Lock 5	13.8%	0.0%	13.8%	13.8%	17.0%	12.2%
107	N	Below Lock 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
108	C	Below Lock 5	13.8%	0.0%	13.8%	13.8%	17.0%	0.0%
109	N	Below Lock 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
110	C	Below Lock 5	47.0%	0.0%	47.0%	47.0%	54.2%	5.7%
111	N	Below Lock 5	28.8%	0.0%	28.8%	28.8%	32.2%	0.0%
112	C	Below Lock 5	47.0%	0.0%	47.0%	47.0%	54.2%	1.6%
113	N	Below Lock 5	28.8%	0.0%	28.8%	28.8%	32.2%	1.1%
114	C	Below Lock 5	55.7%	0.0%	55.7%	55.7%	63.0%	0.0%
115	N	Below Lock 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
116	C	Below Lock 5	55.7%	0.0%	55.7%	55.7%	63.0%	15.9%
117	N	Below Lock 5	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%
118	C	Below Lock 5	40.9%	0.0%	40.9%	40.9%	46.2%	0.0%
119	N	Below Lock 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
120	C	Below Lock 5	40.9%	0.0%	40.9%	40.9%	46.2%	0.0%
121	N	Below Lock 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
122	N	Below Lock 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
123	N	Below Lock 5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

HUDSON RIVER PCBs REASSESSMENT FS
Engineering Modeling Scenarios Input Specifications

The procedure used to specify input to HUDTOX for the Engineering modeling scenarios are described in this section. The input tables are also provided these scenarios.

In this phase of the modeling, actual potential remedial alternatives were modeled. The main differences between the model input for these alternatives and the Preliminary scenarios are the basic assumptions for delineating areas for sediment removal or capping. Preliminary scenarios are based on theoretical removal to a target PCB concentration; whereas Engineering scenarios take into consideration actual physical limitations due to equipment and/or access issues.

Target areas are defined as areas that have sediment sample(s) with PCB levels greater than a minimum target area criterion. (Minimum target area criteria are defined on the basis of mass per unit area [g/m^2]). Some judgment was used in determining whether to include or exclude certain areas. For example, if an area includes only one sampling point greater than the target PCB level with surrounding samples with lower PCB levels, then the area would not be included as a target area. On the other hand, if a sampling point with less than the target PCB level is found in an area with surrounding elevated PCB detections, the area would be included as a target area.

A brief description of the Engineering scenarios follows.

Alternative 1

All sediments (full section) in dredgeable areas are removed from Rogers Island to Lock 5 to a predetermined elevation. Below Lock 5, a PCB level of 3 g/m^2 was selected as the minimum target area criterion (minimum target area criterion described above). In this section of the river, target areas with sediments (cohesive and non-cohesive) with PCB levels greater than 3 g/m^2 are removed. The upstream loading for this alternative is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 0.25 mg/kg for the top 26 cm of sediment for cohesive sediment segments, and 0.5 mg/kg for the top 26 cm of sediment for non-cohesive sediment segments.

Alternative 2

All sediments (full section) in dredgeable areas are removed from Rogers Island to Thompson Island Dam to a predetermined elevation. In sections of the river below the TIP, a PCB level of 3 g/m^2 was selected as the minimum target area criterion, and target areas with sediments (cohesive and non-cohesive) with PCB levels greater than 3 g/m^2 are removed. The upstream loading for this alternative is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 0.25 mg/kg for the top 26 cm of sediment for cohesive sediment segments, and 0.5 mg/kg for the top 26 cm of sediment for non-cohesive sediment segments.

Alternative 3

For this alternative, a PCB level of 3 g/m^2 was selected as the minimum target area criterion, and target areas in the Upper Hudson with sediments (cohesive and non-cohesive) with PCB levels greater than 3 g/m^2 are removed. The upstream loading for this alternative is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 0.25 mg/kg for the top 26 cm of sediment for cohesive sediment segments, and 0.5 mg/kg for the top 26 cm of sediment for non-cohesive sediment segments.

Alternative 3B

This alternative includes the same components as Alternative 3 except the upstream loading is 0 ng/L.

Alternative 3C

This alternative includes the same components as Alternative 3 except the upstream loading is 30 ng/L.

Alternative 4

For this alternative, a PCB level of 10 g/m^2 was selected as the minimum target area criterion, and target areas in the Upper Hudson with sediments (cohesive and non-cohesive) with PCB levels greater than 10 g/m^2 are removed. The upstream loading for this alternative is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 0.25 mg/kg for the top 26 cm of sediment for cohesive sediment segments, and 0.5 mg/kg for the top 26 cm of sediment for non-cohesive sediment segments.

Alternative 5

For this alternative, target areas in the Thompson Island Pool with sediments (cohesive and non-cohesive) with PCB levels greater than 3 g/m^2 are removed. Below the TIP, target areas with sediments (cohesive and non-cohesive) with PCB levels greater than 10 g/m^2 are removed. The upstream loading for this alternative is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 0.25 mg/kg for the top 26 cm of sediment for cohesive sediment segments, and 0.5 mg/kg for the top 26 cm of sediment for non-cohesive sediment segments.

Alternative 6

For this alternative, all sediments identified as cohesive sediments by side scan sonar survey are removed from Rogers Island to Lock 5. There is no sediment removal from Lock 5 to Federal Dam. The upstream loading for this alternative is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 0.25 mg/kg for the top 26 cm of sediment for cohesive sediment segments, and 0.5 mg/kg for the top 26 cm of sediment for non-cohesive sediment segments.

Alternative 7

For this alternative, full section remediation is planned for the Thompson Island Pool (i.e., the minimum target area criterion is assumed to be 0 g/m^2), and 3 g/m^2 was selected as the minimum target area criterion for the next section of the river (Thompson Island Dam to Lock 5). There is no sediment remediation from Lock 5 to Federal Dam. All sediments in dredgeable areas are removed from the Thompson Island Pool to a predetermined elevation. In the Lock 5 pool, target areas with sediments (cohesive and non-cohesive) with PCB levels greater than 3 g/m^2 are removed. The upstream loading for this alternative is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 0.25 mg/kg for the top 26 cm of sediment for cohesive sediment segments, and 0.5 mg/kg for the top 26 cm of sediment for non-cohesive sediment segments.

Alternative 8

For this alternative, target areas from Rogers Island to Federal Dam with sediments (cohesive and non-cohesive) with PCB levels greater than 3 g/m^2 with associated water depths less than 6 feet will be removed and subsequently capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than 3 g/m^2 with associated water depths greater than 6 feet and less than 12 feet will be capped.

Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than 3 g/m^2 with associated water depths greater than 12 feet will be removed or capped. The 12-foot water depth contour is assumed to represent the edge of the navigation channel. Capping will not be conducted within the navigation channel, except in portions of the river where the navigation channel is located within a land cut adjacent to the river. Therefore, target areas with associated water depths greater than 12 feet will be dredged; except in portions of the river where the navigation channel is located within a land cut, target areas with associated water depths greater than 12 feet will be capped.

The upstream loading for this alternative is assumed to be 10 ng/L. It is assumed that the residual sediment concentration in the capped areas will be 0 mg/kg for the top 26 cm of sediment, and the residual sediment concentration in the areas where sediments are removed (and not capped) will be 1 mg/kg for the top 10 cm of sediment and 0 mg/kg below.

Alternative 8B

This alternative includes the same components as Alternative 8 except the upstream loading is 0 ng/L.

Alternative 9

For this alternative, target areas from Rogers Island to Federal Dam with sediments (cohesive and non-cohesive) with PCB levels greater than 10 g/m^2 with associated water depths less than 6 feet will be removed and subsequently capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than 10 g/m^2 with associated water depths greater than 6 feet and less than 12 feet will be capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than 10 g/m^2 with associated water depths greater than 12 feet will be removed or capped. The dredging and capping criteria in the navigational channel described in Alternative 8 will be followed for this alternative.

The upstream loading for this alternative is assumed to be 10 ng/L. It is assumed that the residual sediment concentration in the capped areas will be 0 mg/kg for the top 26 cm of sediment, and the residual sediment concentration in the areas where sediments are removed (and not capped) will be 1 mg/kg for the top 10 cm of sediment and 0 mg/kg below.

Alternative 10

For this alternative, 3 g/m^2 was selected as the minimum target area criterion for the Thompson Island Pool (TIP), and 10 g/m^2 was selected as the minimum target area criterion for the rest of the river. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths less than 6 feet will be removed and subsequently capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 6 feet and less than 12 feet will be capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 12 feet will be removed or capped. The dredging and capping criteria in the navigational channel described in Alternative 8 will be followed for this alternative.

The upstream loading for this alternative is assumed to be 10 ng/L. It is assumed that the residual sediment concentration in the capped areas will be 0 mg/kg for the top 26 cm of sediment, and the residual sediment concentration in the areas where sediments are removed (and not capped) will be 1 mg/kg for the top 10 cm of sediment and 0 mg/kg below.

Alternative 11

For this alternative, full section remediation is planned for the Thompson Island Pool (i.e., the minimum target area criterion is assumed to be 0 g/m^2), and 3 g/m^2 was selected as the minimum target area criterion for the next section of the river (Thompson Island Dam to Lock 5). There is no sediment remediation from Lock 5 to Federal Dam. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths less than 6 feet will be removed and subsequently capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 6 feet and less than 12 feet will be capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 12 feet will be removed or capped. The dredging and capping criteria in the navigational channel described in Alternative 8 will be followed for this alternative.

The upstream loading for this alternative is assumed to be 10 ng/L. It is assumed that the residual sediment concentration in the capped areas will be 0 mg/kg for the top 26 cm of sediment, and the residual sediment concentration in the areas where sediments are removed (and not capped) will be 1 mg/kg for the top 10 cm of sediment and 0 mg/kg below.

Alternative 12

For this alternative, full section remediation is planned for the Thompson Island Pool (i.e., the minimum target area criterion is assumed to be 0 g/m^2). No remediation is planned for the river sediments below Thompson Island Dam. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths less than 6 feet will be removed and subsequently capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 6 feet and less than 12 feet will be capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 12 feet will be removed or capped. The dredging and capping criteria in the navigational channel described in Alternative 8 will be followed for this alternative.

The upstream loading for this alternative is assumed to be 10 ng/L. It is assumed that the residual sediment concentration in the capped areas will be 0 mg/kg for the top 26 cm of sediment, and the residual sediment concentration in the areas where sediments are removed (and not capped) will be 1 mg/kg for the top 10 cm of sediment and 0 mg/kg below.

Alternative 13

For this alternative, 3 g/m^2 was selected as the minimum target area criterion for the TIP. No remediation is planned for the river sediments below Thompson Island Dam. Target areas in the TIP with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths less than 6 feet will be removed and subsequently capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 6 feet and less than 12 feet will be capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 12 feet will be removed or capped. The dredging and capping criteria in the navigational channel described in Alternative 8 will be followed for this alternative.

The upstream loading for this alternative is assumed to be 10 ng/L. It is assumed that the residual sediment concentration in the capped areas will be 0 mg/kg for the top 26 cm of sediment, and the residual sediment concentration in the areas where sediments are removed (and not capped) will be 1 mg/kg for the top 10 cm of sediment and 0 mg/kg below.

Alternative 14

For this alternative, full section remediation is planned for both the Thompson Island Pool and for the next section of the river from Thompson Island Dam to Lock 5 (i.e., the minimum target area criterion is assumed to be 0 g/m^2). There is no sediment remediation from Lock 5 to Federal Dam. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths less than 6 feet will be removed and subsequently capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 6 feet and less than 12 feet will be capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 12 feet will be removed or capped. The dredging and capping criteria in the navigational channel described in Alternative 8 will be followed for this alternative.

The upstream loading for this alternative is assumed to be 10 ng/L. It is assumed that the residual sediment concentration in the capped areas will be 0 mg/kg for the top 26 cm of sediment, and the residual sediment concentration in the areas where sediments are removed (and not capped) will be 1 mg/kg for the top 10 cm of sediment and 0 mg/kg below.

Alternative 15

For this alternative, 3 g/m^2 was selected as the minimum target area criterion for the Thompson Island Pool and for the next section of the river from Thompson Island Dam to Lock 5. There is no sediment remediation from Lock 5 to Federal Dam. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths less than 6 feet will be removed and subsequently capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 6 feet and less than 12 feet will be capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 12 feet will be removed or capped. The dredging and capping criteria in the navigational channel described in Alternative 8 will be followed for this alternative.

The upstream loading for this alternative is assumed to be 10 ng/L. It is assumed that the residual sediment concentration in the capped areas will be 0 mg/kg for the top 26 cm of sediment, and the residual sediment concentration in the areas where sediments are removed (and not capped) will be 1 mg/kg for the top 10 cm of sediment and 0 mg/kg below.

Alternative 16

For this alternative, full section remediation is planned for the Thompson Island Pool (i.e., the minimum target area criterion is assumed to be 0 g/m^2), and 10 g/m^2 was selected as the minimum target area criterion for the next section of the river (Thompson Island Dam to Lock 5). There is no sediment remediation from Lock 5 to Federal Dam. All sediments in dredgeable areas are removed from the Thompson Island Pool to a predetermined elevation. In the Lock 5 pool, target areas with sediments (cohesive and non-cohesive) with PCB levels greater than 10 g/m^2 are removed. The upstream loading for this alternative is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 0.25 mg/kg for the top 26 cm of sediment for cohesive sediment segments, and 0.5 mg/kg for the top 26 cm of sediment for non-cohesive sediment segments.

Alternative 17

For this alternative, full section remediation is planned for the Thompson Island Pool (i.e., the minimum target area criterion is assumed to be 0 g/m^2), and 10 g/m^2 was selected as the minimum target area criterion for the next 2 sections of the river (Thompson Island Dam to Lock 5 and Lock 5 to Federal Dam). All sediments in dredgeable areas are removed from the Thompson Island Pool to a predetermined elevation. Below Thompson Island Dam, target areas with sediments (cohesive and non-cohesive) with PCB levels greater than 10 g/m^2 are removed. The upstream loading for this alternative is assumed to be 10 ng/L. The residual sediment concentration is assumed to be 0.25 mg/kg for the top 26 cm of sediment for cohesive sediment segments, and 0.5 mg/kg for the top 26 cm of sediment for non-cohesive sediment segments.

Alternative 18

For this alternative, full section remediation is planned for the Thompson Island Pool (i.e., the minimum target area criterion is assumed to be 0 g/m^2), and 10 g/m^2 was selected as the minimum target area criterion for the rest of the river. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths less than 6 feet will be removed and subsequently capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 6 feet and less than 12 feet will be capped. Target areas with sediments (cohesive and non-cohesive) with PCB levels greater than the minimum target area criterion with associated water depths greater than 12 feet will be removed or capped. The dredging and capping criteria in the navigational channel described in Alternative 8 will be followed for this alternative.

The upstream loading for this alternative is assumed to be 10 ng/L. It is assumed that the residual sediment concentration in the capped areas will be 0 mg/kg for the top 26 cm of sediment, and the residual sediment concentration in the areas where sediments are removed (and not capped) will be 1 mg/kg for the top 10 cm of sediment and 0 mg/kg below.

HUDSON RIVER PCBs REASSESSMENT FS
Engineering Modeling Scenarios Input Specifications

Data Provided to LTI

For each removal alternative, a table was provided which includes for each sediment segment: a PCB percent mass remaining to be applied to the model output cores in 2004 (or 2005, 2006, etc., as appropriate), and the percent of the area in the sediment segment that the PCB percent mass remaining is applied to (i.e., the percent of the segment that is non-dredged area). The core profile for all dredged areas (i.e., area where sediments are removed) is assumed to be 0.25 mg/kg for the entire core length represented in the model (26 cm) for cohesive sediment segments, and 0.5 mg/kg for the entire core length for non-cohesive sediment segments. A new area-weighted core profile was calculated for each sediment segment using the new cores in the non-dredged area and in the dredged area in the segment. An example calculation for a core profile after remediation is provided. The schedule for sediment removal is provided in the input tables.

For each capping alternative, a table was provided which includes for each sediment segment: a PCB percent mass remaining to be applied to the model output cores in 2004 (or 2005, 2006, etc., as appropriate), and the percent of the area in the sediment segment that the PCB percent mass remaining is applied to (i.e., the percent of the segment area that is not remediated). The percent of the area in the sediment segment that is capped and the percent of the area that is dredged is also provided. The core profile for all capped areas is assumed to be 0 mg/kg for the entire core length represented in the model (26 cm). The core profile for dredged areas that are not subsequently capped is 1 mg/kg for the top 10 cm of sediment and 0 mg/kg below. A new area-weighted core profile was calculated for each sediment segment using the new cores in the non-remediated area and in the remediated (capped and dredged) area in the segment. An example calculation for a core profile after remediation is provided. The schedule for sediment remediation is provided in the input tables.

If PCB concentration in the core after remediation is higher than the PCB concentration before remediation, the model output at the time when remediation is completed was used rather than the area-weighted calculated core profile.

Sensitivity Analysis

Three sensitivity analyses were conducted for the removal scenarios. The sensitivity analyses used the input for Alternative 3 with the following changes:
- Three different residual PCB concentrations: 1 ppm (Scenario E3S1), 2 ppm (E3S2), and 5 ppm (E3S5), versus the original Alternative 3 residual concentration of 0.25 ppm. The residual concentrations take into account that a foot of clean backfill material has been placed over the dredged areas (i.e., the 1 ppm residual assumes that the PCB concentration was 4 ppm in the top 3 inches of the dredged surface prior to backfilling. The clean backfill material results in depth-averaged concentration of 1 ppm in the top foot of sediments)
- The residual PCBs were used in the "PCB mass remaining" calculations for each sediment segment.

Three sensitivity analyses were conducted for the capping scenarios. The sensitivity analyses used the input for Alternative 8 with the following changes:

- In the area where the cap is planned, a percent of the area is assumed to be not capped (this may be due to omission of the area during placement for some reason, or damage to the cap after placement). The 3 cases that were modeled were: 5% (Scenario E8S5), 10% (E8S10), and 25% (E3S25) of the areas planned for capping were not capped.
- To represent the missing cap portions, random areas were selected in the to-be-capped areas to represent 5, 10, and 25% of the area that are not capped. Random areas were selected by placing a grid (with 120' x 120' squares) over the river, assigning a number to each square, run a random number selector in Excel to select grid squares to be removed to achieve the percent area required. The mass of PCBs remaining (i.e., not capped or removed) was calculated for each of the capping sensitivity analysis runs, as well as the percent of area remediated.

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E1					
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	2.61%	1.89%	N	0.5
49	Aug-04	0.00%	0.00%	N	0.5
50	Aug-04	3.80%	2.77%	N	0.5
51	Aug-04	9.34%	3.30%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	0.00%	0.00%	N	0.5
54	Aug-04	0.00%	0.00%	N	0.5
55	Aug-04	0.00%	0.00%	N	0.5
56	Aug-04	0.56%	0.56%	C	0.25
57	Aug-04	22.72%	5.23%	N	0.5
58	Aug-04	1.65%	3.63%	N	0.5
59	Aug-04	0.00%	0.00%	C	0.25
60	Aug-04	0.00%	0.00%	N	0.5
61	Aug-04	0.00%	0.00%	C	0.25
62	Aug-04	0.00%	0.00%	N	0.5
63	Aug-05	0.00%	0.00%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	0.00%	0.00%	N	0.5
66	Aug-05	2.04%	2.04%	C	0.25
67	Aug-05	1.38%	1.00%	N	0.5
68	Aug-05	7.54%	7.54%	C	0.25
69	Aug-05	0.41%	1.71%	N	0.5
70	Aug-05	0.00%	0.00%	C	0.25
71	Aug-05	0.00%	0.00%	N	0.5
72	Aug-05	1.60%	1.60%	C	0.25
73	Aug-05	3.27%	2.38%	N	0.5
74	Aug-05	7.64%	7.60%	N	0.5
75	Aug-05	82.05%	41.30%	C	0.25
76	Aug-05	36.65%	7.22%	N	0.5
77	Aug-05	0.00%	0.00%	N	0.5
78	Aug-05	6.35%	6.35%	C	0.25
79	Aug-05	14.03%	7.41%	N	0.5
80	Aug-05	1.59%	2.68%	C	0.25
81	Aug-05	0.00%	0.00%	C	0.25
82	Aug-05	0.00%	0.00%	N	0.5
83	Aug-06	62.52%	10.92%	N	0.5
84	Aug-06	1.92%	8.71%	C	0.25
85	Aug-06	24.59%	19.01%	N	0.5
86	Aug-06	0.00%	0.00%	N	0.5
87	Aug-06	0.81%	0.59%	N	0.5
88	Aug-06	0.00%	0.00%	C	0.25
89	Aug-06	3.25%	2.36%	N	0.5
90	Aug-06	10.40%	11.59%	C	0.25
91	Aug-06	7.05%	5.18%	N	0.5
92	Aug-07	3.21%	5.10%	C	0.25
93	Aug-07	8.59%	6.34%	N	0.5
94	Aug-07	2.01%	2.01%	C	0.25
95	Aug-08	0.15%	5.73%	N	0.5
96	Aug-08	98.19%	97.51%	N	0.5
97			No change		
98			No change		
99			No change		
100			No change		
101			No change		
102	Aug-08	86.58%	90.25%	C	0.25
103	Aug-08	90.07%	97.57%	N	0.5
104	Aug-08	85.30%	97.21%	C	0.25
105	Aug-08	99.17%	99.66%	N	0.5
106	Aug-08	31.16%	32.77%	C	0.25
107	Aug-08	86.25%	96.81%	N	0.5
108			No change		
109			No change		
110			No change		
111			No change		
112	Aug-08	21.28%	67.58%	C	0.25
113	Aug-08	12.15%	74.36%	N	0.5
114			No change		
115			No change		
116	Aug-08	23.62%	72.86%	C	0.25
117	Aug-08	32.01%	68.82%	N	0.5
118			No change		
119			No change		
120			No change		
121			No change		
122			No change		
123			No change		

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E2					
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	2.61%	1.89%	N	0.5
49	Aug-04	0.00%	0.00%	N	0.5
50	Aug-04	3.80%	2.77%	N	0.5
51	Aug-04	9.34%	3.30%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	0.00%	0.00%	N	0.5
54	Aug-04	0.00%	0.00%	N	0.5
55	Aug-04	0.00%	0.00%	N	0.5
56	Aug-04	0.56%	0.56%	C	0.25
57	Aug-04	22.72%	5.23%	N	0.5
58	Aug-05	1.65%	3.63%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	0.00%	0.00%	C	0.25
62	Aug-05	0.00%	0.00%	N	0.5
63	Aug-05	0.00%	0.00%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	0.00%	0.00%	N	0.5
66	Aug-05	2.04%	2.04%	C	0.25
67	Aug-05	1.38%	1.00%	N	0.5
68	Aug-05	7.54%	7.54%	C	0.25
69	Aug-05	0.41%	1.71%	N	0.5
70	Aug-05	0.00%	0.00%	C	0.25
71	Aug-05	0.00%	0.00%	N	0.5
72	Aug-06	1.60%	1.60%	C	0.25
73	Aug-06	3.27%	2.38%	N	0.5
74	Aug-06	7.64%	7.60%	N	0.5
75	Aug-06	82.05%	41.30%	C	0.25
76	Aug-06	36.65%	7.22%	N	0.5
77	Aug-06	0.00%	0.00%	N	0.5
78	Aug-06	6.35%	6.35%	C	0.25
79	Aug-06	14.03%	7.41%	N	0.5
80	Aug-06	1.59%	2.68%	C	0.25
81	Aug-06	0.00%	0.00%	C	0.25
82	Aug-06	0.00%	0.00%	N	0.5
83	Aug-06	62.52%	10.92%	N	0.5
84	Aug-06	1.92%	8.71%	C	0.25
85	Aug-06	24.59%	19.01%	N	0.5
86	Aug-06	0.00%	0.00%	N	0.5
87	Aug-06	0.81%	0.59%	N	0.5
88	Aug-07	0.00%	0.00%	C	0.25
89	Aug-07	3.25%	2.36%	N	0.5
90	Aug-07	20.36%	29.14%	C	0.25
91	Aug-07	97.56%	96.98%	N	0.5
92	Aug-07	0.43%	19.53%	C	0.25
93	Aug-07	86.98%	93.05%	N	0.5
94	Aug-07	6.91%	38.55%	C	0.25
95	Aug-07	63.81%	87.77%	N	0.5
96	No change				
97	No change				
98	No change				
99	No change				
100	No change				
101	No change				
102	Aug-08	86.58%	90.25%	C	0.25
103	Aug-08	90.07%	97.57%	N	0.5
104	Aug-08	85.30%	97.21%	C	0.25
105	Aug-08	99.17%	99.66%	N	0.5
106	Aug-08	31.16%	32.77%	C	0.25
107	Aug-08	86.25%	96.81%	N	0.5
108	No change				
109	No change				
110	No change				
111	No change				
112	Aug-08	21.28%	67.58%	C	0.25
113	Aug-08	12.15%	74.36%	N	0.5
114	No change				
115	No change				
116	Aug-08	23.62%	72.86%	C	0.25
117	Aug-08	32.01%	68.82%	N	0.5
118	No change				
119	No change				
120	No change				
121	No change				
122	No change				
123	No change				

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIOS E3 AND E3B						
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)	
48	Aug-04	98.12%	88.60%	N	0.5	
49	Aug-04	100.00%	100.00%	N	0.5	
50	Aug-04	87.19%	73.83%	N	0.5	
51	Aug-04	1.90%	23.74%	N	0.5	
52	Aug-04	2.82%	20.12%	C	0.25	
53	Aug-04	53.91%	54.80%	N	0.5	
54	Aug-04	69.63%	60.89%	N	0.5	
55	Aug-04	95.29%	93.51%	N	0.5	
56	Aug-04	0.60%	0.60%	C	0.25	
57	Aug-04	22.66%	5.33%	N	0.5	
58	Aug-04	1.65%	3.64%	N	0.5	
59	Aug-04	0.00%	0.00%	C	0.25	
60	Aug-04	0.00%	0.00%	N	0.5	
61	Aug-04	2.57%	15.22%	C	0.25	
62	Aug-04	62.53%	71.16%	N	0.5	
63	Aug-05	36.96%	41.45%	N	0.5	
64	Aug-05	0.00%	0.00%	C	0.25	
65	Aug-05	0.00%	0.00%	N	0.5	
66	Aug-05	36.79%	60.34%	C	0.25	
67	Aug-05	47.92%	74.63%	N	0.5	
68	Aug-05	15.94%	55.70%	C	0.25	
69	Aug-05	63.12%	71.95%	N	0.5	
70	Aug-05	0.00%	0.00%	C	0.25	
71	Aug-05	0.00%	0.00%	N	0.5	
72	Aug-05	6.03%	14.61%	C	0.25	
73	Aug-05	6.56%	18.69%	N	0.5	
74	Aug-05	45.86%	48.88%	N	0.5	
75	Aug-05	63.78%	57.52%	C	0.25	
76	Aug-05	17.59%	23.46%	N	0.5	
77	Aug-05	21.03%	57.62%	N	0.5	
78	Aug-05	7.09%	7.09%	C	0.25	
79	Aug-05	66.15%	60.67%	N	0.5	
80	Aug-05	5.07%	5.06%	C	0.25	
81	Aug-06	3.94%	34.48%	C	0.25	
82	Aug-06	93.25%	69.75%	N	0.5	
83	Aug-06	94.68%	69.64%	N	0.5	
84	Aug-06	1.89%	10.39%	C	0.25	
85	Aug-06	37.23%	29.93%	N	0.5	
86	Aug-06	25.59%	55.59%	N	0.5	
87	Aug-06	55.79%	75.98%	N	0.5	
88	Aug-06	9.11%	32.26%	C	0.25	
89	Aug-06	50.24%	73.92%	N	0.5	
90	Aug-06	20.36%	29.14%	C	0.25	
91	Aug-06	97.56%	96.98%	N	0.5	
92	Aug-06	0.43%	19.53%	C	0.25	
93	Aug-07	86.98%	93.05%	N	0.5	
94	Aug-07	6.91%	38.55%	C	0.25	
95	Aug-07	63.81%	87.77%	N	0.5	
96			No change			
97			No change			
98			No change			
99			No change			
100			No change			
101			No change			
102	Aug-07	86.58%	90.25%	C	0.25	
103	Aug-07	90.07%	97.57%	N	0.5	
104	Aug-07	85.30%	97.21%	C	0.25	
105	Aug-07	99.17%	99.66%	N	0.5	
106	Aug-07	31.16%	32.77%	C	0.25	
107	Aug-08	86.25%	96.81%	N	0.5	
108			No change			
109			No change			
110			No change			
111			No change			
112	Aug-08	21.28%	67.58%	C	0.25	
113	Aug-08	12.15%	74.36%	N	0.5	
114			No change			
115			No change			
116	Aug-08	23.62%	72.86%	C	0.25	
117	Aug-08	32.01%	68.82%	N	0.5	
118			No change			
119			No change			
120			No change			
121			No change			
122			No change			
123			No change			

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E4					
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	No Change	No Change	No Change	No Change	No Change
49	No Change	No Change	No Change	No Change	No Change
50	Aug-04	95.97%	79.67%	N	0.5
51	No Change	No Change	No Change	No Change	No Change
52	Aug-04	2.81%	20.02%	C	0.25
53	Aug-04	64.05%	54.76%	N	0.5
54	Aug-04	88.06%	86.89%	N	0.5
55	No Change	No Change	No Change	No Change	No Change
56	Aug-04	0.53%	2.78%	C	0.25
57	Aug-04	65.77%	69.37%	N	0.5
58	Aug-04	91.86%	89.42%	N	0.5
59	Aug-04	4.07%	7.77%	C	0.25
60	Aug-04	5.01%	17.24%	N	0.5
61	Aug-04	5.73%	24.88%	C	0.25
62	Aug-04	73.84%	76.60%	N	0.5
63	Aug-05	94.53%	93.55%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	17.07%	27.62%	N	0.5
66	Aug-05	46.62%	75.24%	C	0.25
67	Aug-05	55.80%	79.20%	N	0.5
68	Aug-05	17.86%	57.71%	C	0.25
69	Aug-05	74.17%	91.36%	N	0.5
70	Aug-05	0.00%	0.00%	C	0.25
71	Aug-05	38.45%	15.49%	N	0.5
72	Aug-05	6.82%	31.85%	C	0.25
73	Aug-05	64.03%	72.39%	N	0.5
74	Aug-05	90.22%	88.22%	N	0.5
75	Aug-05	96.23%	96.60%	C	0.25
76	No Change	No Change	No Change	No Change	No Change
77	No Change	No Change	No Change	No Change	No Change
78	Aug-05	7.65%	7.65%	C	0.25
79	Aug-05	99.63%	99.40%	N	0.5
80	Aug-06	15.47%	9.90%	C	0.25
81	Aug-06	17.18%	72.70%	C	0.25
82	Aug-06	96.75%	94.87%	N	0.5
83	Aug-06	99.30%	95.52%	N	0.5
84	Aug-06	4.24%	11.86%	C	0.25
85	No Change	No Change	No Change	No Change	No Change
86	Aug-06	66.36%	87.99%	N	0.5
87	Aug-06	83.02%	93.70%	N	0.5
88	Aug-06	17.54%	48.41%	C	0.25
89	Aug-06	63.81%	81.00%	N	0.5
90	Aug-06	32.92%	52.64%	C	0.25
91	Aug-06	99.76%	99.62%	N	0.5
92	Aug-07	3.30%	49.53%	C	0.25
93	Aug-07	99.73%	99.57%	N	0.5
94	Aug-07	14.59%	57.42%	C	0.25
95	Aug-08	81.64%	92.87%	N	0.5
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	Aug-08	51.80%	67.58%	C	0.25
113	Aug-08	18.49%	74.35%	N	0.5
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	Aug-08	23.16%	72.34%	C	0.25
117	Aug-08	60.37%	90.20%	N	0.5
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E5					
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	98.12%	88.60%	N	0.5
49	Aug-04	100.00%	100.00%	N	0.5
50	Aug-04	87.19%	73.83%	N	0.5
51	Aug-04	1.90%	23.74%	N	0.5
52	Aug-04	2.82%	20.12%	C	0.25
53	Aug-04	53.91%	54.80%	N	0.5
54	Aug-04	69.63%	60.89%	N	0.5
55	Aug-04	95.29%	93.51%	N	0.5
56	Aug-04	0.60%	0.60%	C	0.25
57	Aug-04	22.66%	5.33%	N	0.5
58	Aug-04	1.65%	3.64%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	2.57%	15.22%	C	0.25
62	Aug-05	62.53%	71.16%	N	0.5
63	Aug-05	36.96%	41.45%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	0.00%	0.00%	N	0.5
66	Aug-05	36.79%	60.34%	C	0.25
67	Aug-05	47.92%	74.63%	N	0.5
68	Aug-05	15.94%	55.70%	C	0.25
69	Aug-05	63.12%	71.95%	N	0.5
70	Aug-05	0.00%	0.00%	C	0.25
71	Aug-06	0.00%	0.00%	N	0.5
72	Aug-06	6.03%	14.61%	C	0.25
73	Aug-06	6.56%	18.69%	N	0.5
74	Aug-06	45.86%	48.88%	N	0.5
75	Aug-06	63.78%	57.52%	C	0.25
76	Aug-06	17.59%	23.46%	N	0.5
77	Aug-06	21.03%	57.62%	N	0.5
78	Aug-06	7.09%	7.09%	C	0.25
79	Aug-06	66.15%	60.67%	N	0.5
80	Aug-06	5.07%	5.06%	C	0.25
81	Aug-06	3.94%	34.48%	C	0.25
82	Aug-06	93.25%	69.75%	N	0.5
83	Aug-06	94.68%	69.64%	N	0.5
84	Aug-06	1.89%	10.39%	C	0.25
85	Aug-07	37.23%	29.93%	N	0.5
86	Aug-07	25.59%	55.59%	N	0.5
87	Aug-07	55.79%	75.98%	N	0.5
88	Aug-07	9.11%	32.26%	C	0.25
89	Aug-07	50.24%	73.92%	N	0.5
90	Aug-07	32.92%	52.64%	C	0.25
91	Aug-07	99.76%	99.62%	N	0.5
92	Aug-07	3.30%	49.53%	C	0.25
93	Aug-07	99.73%	99.57%	N	0.5
94	Aug-08	14.59%	57.42%	C	0.25
95	Aug-08	81.64%	92.87%	N	0.5
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	Aug-08	51.80%	67.58%	C	0.25
113	Aug-08	18.49%	74.35%	N	0.5
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	Aug-08	23.16%	72.34%	C	0.25
117	Aug-08	60.37%	90.20%	N	0.5
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E6					
SedSeg#	Year to Dredge	% PCB Mass Remains		sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	97.38%	97.74%	N	0.5
49	Aug-04	85.85%	93.76%	N	0.5
50	Aug-04	96.03%	79.93%	N	0.5
51	Aug-04	96.28%	84.86%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	94.06%	89.88%	N	0.5
54	Aug-04	98.83%	98.82%	N	0.5
55	Aug-04	100.00%	100.00%	N	0.5
56	Aug-04	0.32%	0.59%	C	0.25
57	Aug-04	99.30%	98.88%	N	0.5
58	Aug-04	92.36%	91.70%	N	0.5
59	Aug-04	0.00%	0.00%	C	0.25
60	Aug-04	100.00%	100.00%	N	0.5
61	Aug-04	0.00%	0.00%	C	0.25
62	Aug-04	100.00%	100.00%	N	0.5
63	Aug-04	96.84%	89.61%	N	0.5
64	Aug-04	0.00%	0.44%	C	0.25
65	Aug-04	100.00%	100.00%	N	0.5
66	Aug-04	1.41%	2.04%	C	0.25
67	Aug-05	25.94%	51.01%	N	0.5
68	Aug-05	2.94%	7.56%	C	0.25
69	Aug-05	64.24%	88.01%	N	0.5
70	Aug-05	0.00%	0.00%	C	0.25
71	Aug-05	29.79%	14.86%	N	0.5
72	Aug-05	2.02%	2.02%	C	0.25
73	Aug-05	57.18%	67.44%	N	0.5
74	Aug-05	99.94%	98.48%	N	0.5
75	Aug-05	88.74%	48.25%	C	0.25
76	Aug-05	100.00%	100.00%	N	0.5
77	Aug-05	92.47%	71.44%	N	0.5
78	Aug-05	7.36%	7.36%	C	0.25
79	Aug-05	95.17%	96.30%	N	0.5
80	Aug-05	20.53%	7.85%	C	0.25
81	Aug-06	0.00%	0.00%	C	0.25
82	Aug-06	98.39%	97.43%	N	0.5
83	Aug-06	98.80%	92.49%	N	0.5
84	Aug-06	1.86%	10.22%	C	0.25
85	Aug-06	83.40%	75.70%	N	0.5
86	Aug-06	70.07%	85.81%	N	0.5
87	Aug-06	86.59%	91.90%	N	0.5
88	Aug-06	0.00%	0.00%	C	0.25
89	Aug-06	99.31%	98.26%	N	0.5
90	Aug-06	7.60%	15.88%	C	0.25
91	Aug-06	95.84%	97.97%	N	0.5
92	Aug-07	0.21%	4.22%	C	0.25
93	Aug-07	98.58%	96.11%	N	0.5
94	Aug-08	0.48%	1.01%	C	0.25
95	Aug-08	95.22%	96.19%	N	0.5
96	No change	No change	No change	No change	No change
97	No change	No change	No change	No change	No change
98	No change	No change	No change	No change	No change
99	No change	No change	No change	No change	No change
100	No change	No change	No change	No change	No change
101	No change	No change	No change	No change	No change
102	No change	No change	No change	No change	No change
103	No change	No change	No change	No change	No change
104	No change	No change	No change	No change	No change
105	No change	No change	No change	No change	No change
106	No change	No change	No change	No change	No change
107	No change	No change	No change	No change	No change
108	No change	No change	No change	No change	No change
109	No change	No change	No change	No change	No change
110	No change	No change	No change	No change	No change
111	No change	No change	No change	No change	No change
112	No change	No change	No change	No change	No change
113	No change	No change	No change	No change	No change
114	No change	No change	No change	No change	No change
115	No change	No change	No change	No change	No change
116	No change	No change	No change	No change	No change
117	No change	No change	No change	No change	No change
118	No change	No change	No change	No change	No change
119	No change	No change	No change	No change	No change
120	No change	No change	No change	No change	No change
121	No change	No change	No change	No change	No change
122	No change	No change	No change	No change	No change
123	No change	No change	No change	No change	No change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E7									
SedSeg#	Year to Remediate	% PCB Mass Remains	% sedseg area not remediated	sediment type	PCB conc. In dredge area (ppm)				
48	Aug-04	2.61%	1.89%	N	0.5				
49	Aug-04	0.00%	0.00%	N	0.5				
50	Aug-04	3.80%	2.77%	N	0.5				
51	Aug-04	9.34%	3.30%	N	0.5				
52	Aug-04	0.00%	0.00%	C	0.25				
53	Aug-04	0.00%	0.00%	N	0.5				
54	Aug-04	0.00%	0.00%	N	0.5				
55	Aug-04	0.00%	0.00%	N	0.5				
56	Aug-05	0.56%	0.56%	C	0.25				
57	Aug-05	22.72%	5.23%	N	0.5				
58	Aug-05	1.65%	3.63%	N	0.5				
59	Aug-05	0.00%	0.00%	C	0.25				
60	Aug-05	0.00%	0.00%	N	0.5				
61	Aug-05	0.00%	0.00%	C	0.25				
62	Aug-05	0.00%	0.00%	N	0.5				
63	Aug-05	0.00%	0.00%	N	0.5				
64	Aug-05	0.00%	0.00%	C	0.25				
65	Aug-05	0.00%	0.00%	N	0.5				
66	Aug-06	2.04%	2.04%	C	0.25				
67	Aug-06	1.38%	1.00%	N	0.5				
68	Aug-06	7.54%	7.54%	C	0.25				
69	Aug-06	0.41%	1.71%	N	0.5				
70	Aug-06	0.00%	0.00%	C	0.25				
71	Aug-06	0.00%	0.00%	N	0.5				
72	Aug-06	1.60%	1.60%	C	0.25				
73	Aug-06	3.27%	2.38%	N	0.5				
74	Aug-06	7.64%	7.60%	N	0.5				
75	Aug-06	82.05%	41.30%	C	0.25				
76	Aug-06	9.76%	7.22%	N	0.5				
77	Aug-06	0.00%	0.00%	N	0.5				
78	Aug-06	6.35%	6.35%	C	0.25				
79	Aug-06	14.03%	7.41%	N	0.5				
80	Aug-07	2.68%	2.68%	C	0.25				
81	Aug-07	0.00%	0.00%	C	0.25				
82	Aug-07	0.00%	0.00%	N	0.5				
83	Aug-07	62.52%	10.92%	N	0.5				
84	Aug-07	1.92%	8.71%	C	0.25				
85	Aug-07	24.59%	19.01%	N	0.5				
86	Aug-07	0.00%	0.00%	N	0.5				
87	Aug-07	0.81%	0.59%	N	0.5				
88	Aug-07	0.00%	0.00%	C	0.25				
89	Aug-08	3.25%	2.36%	N	0.5				
90	Aug-08	20.36%	29.14%	C	0.25				
91	Aug-08	97.56%	96.98%	N	0.5				
92	Aug-08	0.43%	19.53%	C	0.25				
93	Aug-08	86.98%	93.05%	N	0.5				
94	Aug-08	6.91%	38.55%	C	0.25				
95	Aug-08	63.81%	87.77%	N	0.5				
96	No Change	No Change	No Change	No Change	No Change				
97	No Change	No Change	No Change	No Change	No Change				
98	No Change	No Change	No Change	No Change	No Change				
99	No Change	No Change	No Change	No Change	No Change				
100	No Change	No Change	No Change	No Change	No Change				
101	No Change	No Change	No Change	No Change	No Change				
102	No Change	No Change	No Change	No Change	No Change				
103	No Change	No Change	No Change	No Change	No Change				
104	No Change	No Change	No Change	No Change	No Change				
105	No Change	No Change	No Change	No Change	No Change				
106	No Change	No Change	No Change	No Change	No Change				
107	No Change	No Change	No Change	No Change	No Change				
108	No Change	No Change	No Change	No Change	No Change				
109	No Change	No Change	No Change	No Change	No Change				
110	No Change	No Change	No Change	No Change	No Change				
111	No Change	No Change	No Change	No Change	No Change				
112	No Change	No Change	No Change	No Change	No Change				
113	No Change	No Change	No Change	No Change	No Change				
114	No Change	No Change	No Change	No Change	No Change				
115	No Change	No Change	No Change	No Change	No Change				
116	No Change	No Change	No Change	No Change	No Change				
117	No Change	No Change	No Change	No Change	No Change				
118	No Change	No Change	No Change	No Change	No Change				
119	No Change	No Change	No Change	No Change	No Change				
120	No Change	No Change	No Change	No Change	No Change				
121	No Change	No Change	No Change	No Change	No Change				
122	No Change	No Change	No Change	No Change	No Change				
123	No Change	No Change	No Change	No Change	No Change				

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIOS 8 AND 8B								
SedSeg#	Year to Remediate	% PCB Mass Remains	% sedseg area not remediated	% sedseg area capped	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	Aug-04	98.12%	88.60%	11.40%	0	0.00%	1	N
49	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
50	Aug-04	87.19%	73.83%	24.83%	0	1.34%	1	N
51	Aug-04	1.90%	23.74%	66.56%	0	9.70%	1	N
52	Aug-04	2.82%	20.12%	66.29%	0	13.59%	1	C
53	Aug-04	53.91%	54.80%	36.35%	0	8.85%	1	N
54	Aug-04	69.63%	60.89%	7.31%	0	31.81%	1	N
55	Aug-04	95.29%	93.51%	5.31%	0	1.18%	1	N
56	Aug-04	0.60%	0.60%	99.40%	0	0.00%	1	C
57	Aug-04	22.66%	5.33%	94.67%	0	0.00%	1	N
58	Aug-04	1.65%	3.64%	55.71%	0	40.64%	1	N
59	Aug-04	0.00%	0.00%	85.39%	0	14.61%	1	C
60	Aug-04	0.00%	0.00%	99.99%	0	0.01%	1	N
61	Aug-04	2.57%	15.22%	76.59%	0	8.19%	1	C
62	Aug-04	62.53%	71.16%	28.60%	0	0.24%	1	N
63	Aug-05	36.96%	41.45%	40.94%	0	17.61%	1	N
64	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	C
65	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	N
66	Aug-05	36.79%	60.34%	39.54%	0	0.13%	1	C
67	Aug-05	47.92%	74.63%	25.37%	0	0.00%	1	N
68	Aug-05	15.94%	55.70%	4.24%	0	40.05%	1	C
69	Aug-05	63.12%	71.95%	12.64%	0	15.41%	1	N
70	Aug-05	0.00%	0.00%	86.12%	0	13.87%	1	C
71	Aug-05	0.00%	0.00%	94.80%	0	5.20%	1	N
72	Aug-05	6.03%	14.61%	75.06%	0	10.32%	1	C
73	Aug-05	6.56%	18.69%	73.18%	0	8.13%	1	N
74	Aug-05	45.86%	48.88%	12.38%	0	38.74%	1	N
75	Aug-05	63.78%	57.52%	33.95%	0	8.53%	1	C
76	Aug-05	17.59%	23.46%	66.04%	0	10.49%	1	N
77	Aug-05	21.03%	57.62%	35.13%	0	7.25%	1	N
78	Aug-05	7.09%	7.09%	82.66%	0	10.25%	1	C
79	Aug-05	66.15%	60.67%	30.34%	0	8.99%	1	N
80	Aug-05	5.07%	5.06%	90.37%	0	4.56%	1	C
81	Aug-06	3.94%	34.48%	59.67%	0	5.85%	1	C
82	Aug-06	93.25%	69.75%	9.94%	0	20.31%	1	N
83	Aug-06	94.68%	69.64%	3.31%	0	27.05%	1	N
84	Aug-06	1.89%	10.39%	82.85%	0	6.76%	1	C
85	Aug-06	37.23%	29.93%	49.55%	0	20.52%	1	N
86	Aug-06	25.59%	55.59%	40.69%	0	3.72%	1	N
87	Aug-06	55.79%	75.98%	13.91%	0	10.12%	1	N
88	Aug-06	9.11%	32.26%	54.68%	0	13.05%	1	C
89	Aug-06	50.24%	73.92%	19.32%	0	6.76%	1	N
90	Aug-06	20.36%	29.14%	70.86%	0	0.00%	1	C
91	Aug-06	97.56%	96.98%	3.02%	0	0.00%	1	N
92	Aug-06	0.43%	19.53%	66.22%	0	14.26%	1	C
93	Aug-07	86.98%	93.05%	1.73%	0	5.21%	1	N
94	Aug-07	6.91%	38.55%	50.48%	0	10.97%	1	C
95	Aug-07	63.81%	87.77%	4.23%	0	8.00%	1	N
96	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
102	Aug-07	86.58%	90.25%	9.75%	0	0.00%	1	C
103	Aug-07	90.07%	97.57%	0.93%	0	1.50%	1	N
104	Aug-07	85.30%	97.21%	2.79%	0	0.00%	1	C
105	Aug-07	99.17%	99.66%	0.30%	0	0.04%	1	N
106	Aug-07	31.16%	32.77%	65.63%	0	1.60%	1	C
107	Aug-08	86.25%	96.81%	3.19%	0	0.00%	1	N
108	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
112	Aug-08	21.28%	67.58%	32.42%	0	0.00%	1	C
113	Aug-08	12.15%	74.36%	25.64%	0	0.00%	1	N
114	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
116	Aug-08	23.62%	72.86%	27.14%	0	0.00%	1	C
117	Aug-08	32.01%	68.82%	30.25%	0	0.93%	1	N
118	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E9								
SedSeg#	Year to Remediate	% PCB Mass Remains	% sedseg area not remediated	% sedseg area capped	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
49	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
50	Aug-04	95.97%	79.67%	18.99%	0	1.34%	1	N
51	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
52	Aug-04	2.81%	20.02%	66.40%	0	13.58%	1	C
53	Aug-04	64.05%	54.76%	36.47%	0	8.78%	1	N
54	Aug-04	88.06%	86.89%	5.73%	0	7.38%	1	N
55	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
56	Aug-04	0.53%	2.78%	97.22%	0	0.00%	1	C
57	Aug-04	65.77%	69.37%	30.63%	0	0.00%	1	N
58	Aug-04	91.86%	89.42%	8.11%	0	2.47%	1	N
59	Aug-04	4.07%	7.77%	77.62%	0	14.61%	1	C
60	Aug-04	5.01%	17.24%	82.76%	0	0.00%	1	N
61	Aug-04	5.73%	24.88%	66.95%	0	8.17%	1	C
62	Aug-04	73.84%	76.60%	23.37%	0	0.03%	1	N
63	Aug-05	94.53%	93.55%	6.41%	0	0.05%	1	N
64	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	C
65	Aug-05	17.07%	27.62%	72.38%	0	0.00%	1	N
66	Aug-05	46.62%	75.24%	24.76%	0	0.00%	1	C
67	Aug-05	55.80%	79.20%	20.80%	0	0.00%	1	N
68	Aug-05	17.86%	57.71%	4.22%	0	38.07%	1	C
69	Aug-05	74.17%	91.36%	5.01%	0	3.63%	1	N
70	Aug-05	0.00%	0.00%	86.14%	0	13.85%	1	C
71	Aug-05	38.45%	15.49%	80.71%	0	3.80%	1	N
72	Aug-05	6.82%	31.85%	60.74%	0	7.41%	1	C
73	Aug-05	64.03%	72.39%	19.69%	0	7.92%	1	N
74	Aug-05	90.22%	88.22%	1.04%	0	10.74%	1	N
75	Aug-05	96.23%	96.60%	3.40%	0	0.00%	1	C
76	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
77	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
78	Aug-05	7.65%	7.65%	82.39%	0	9.96%	1	C
79	Aug-05	99.63%	99.40%	0.42%	0	0.18%	1	N
80	Aug-06	15.47%	9.90%	86.80%	0	3.30%	1	C
81	Aug-06	17.18%	72.70%	27.28%	0	0.01%	1	C
82	Aug-06	96.75%	94.87%	3.64%	0	1.49%	1	N
83	Aug-06	99.30%	95.52%	1.36%	0	3.12%	1	N
84	Aug-06	4.24%	11.86%	82.25%	0	5.89%	1	C
85	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
86	Aug-06	66.36%	87.99%	8.91%	0	3.11%	1	N
87	Aug-06	83.02%	93.70%	4.01%	0	2.30%	1	N
88	Aug-06	17.54%	48.41%	39.24%	0	12.36%	1	C
89	Aug-06	63.81%	81.00%	17.01%	0	1.99%	1	N
90	Aug-06	32.92%	52.64%	47.36%	0	0.00%	1	C
91	Aug-06	99.76%	99.62%	0.38%	0	0.00%	1	N
92	Aug-07	3.30%	49.53%	39.55%	0	10.91%	1	C
93	Aug-07	99.73%	99.57%	0.11%	0	0.32%	1	N
94	Aug-07	14.59%	57.42%	39.49%	0	3.09%	1	C
95	Aug-08	81.64%	92.87%	4.67%	0	2.46%	1	N
96	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
112	Aug-08	51.80%	67.58%	32.42%	0	0.00%	1	C
113	Aug-08	18.49%	74.35%	25.65%	0	0.00%	1	N
114	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
116	Aug-08	23.16%	72.34%	27.66%	0	0.00%	1	C
117	Aug-08	60.37%	90.20%	9.80%	0	0.00%	1	N
118	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E10								
SedSeg#	Year to Remediate	% PCB Mass Remains	% sedseg area not remediated	% sedseg area capped	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	Aug-04	98.12%	88.60%	11.40%	0	0.00%	1	N
49	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
50	Aug-04	87.19%	73.83%	24.83%	0	1.34%	1	N
51	Aug-04	1.90%	23.74%	66.56%	0	9.70%	1	N
52	Aug-04	2.82%	20.12%	66.29%	0	13.59%	1	C
53	Aug-04	53.91%	54.80%	36.35%	0	8.85%	1	N
54	Aug-04	69.63%	60.89%	7.31%	0	31.81%	1	N
55	Aug-04	95.29%	93.51%	5.31%	0	1.18%	1	N
56	Aug-04	0.60%	0.60%	99.40%	0	0.00%	1	C
57	Aug-04	22.66%	5.33%	94.67%	0	0.00%	1	N
58	Aug-04	1.65%	3.64%	55.71%	0	40.64%	1	N
59	Aug-05	0.00%	0.00%	85.39%	0	14.61%	1	C
60	Aug-05	0.00%	0.00%	99.99%	0	0.01%	1	N
61	Aug-05	2.57%	15.22%	76.59%	0	8.19%	1	C
62	Aug-05	62.53%	71.16%	28.60%	0	0.24%	1	N
63	Aug-05	36.96%	41.45%	40.94%	0	17.61%	1	N
64	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	C
65	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	N
66	Aug-05	36.79%	60.34%	39.54%	0	0.13%	1	C
67	Aug-05	47.92%	74.63%	25.37%	0	0.00%	1	N
68	Aug-05	15.94%	55.70%	4.24%	0	40.05%	1	C
69	Aug-05	63.12%	71.95%	12.64%	0	15.41%	1	N
70	Aug-05	0.00%	0.00%	86.12%	0	13.87%	1	C
71	Aug-06	0.00%	0.00%	94.80%	0	5.20%	1	N
72	Aug-06	6.03%	14.61%	75.06%	0	10.32%	1	C
73	Aug-06	6.56%	18.69%	73.18%	0	8.13%	1	N
74	Aug-06	45.86%	48.88%	12.38%	0	38.74%	1	N
75	Aug-06	63.78%	57.52%	33.95%	0	8.53%	1	C
76	Aug-06	17.59%	23.46%	66.04%	0	10.49%	1	N
77	Aug-06	21.03%	57.62%	35.13%	0	7.25%	1	N
78	Aug-06	7.09%	7.09%	82.66%	0	10.25%	1	C
79	Aug-06	66.15%	60.67%	30.34%	0	8.99%	1	N
80	Aug-06	5.07%	5.06%	90.37%	0	4.56%	1	C
81	Aug-06	3.94%	34.48%	59.67%	0	5.85%	1	C
82	Aug-06	93.25%	69.75%	9.94%	0	20.31%	1	N
83	Aug-06	94.68%	69.64%	3.31%	0	27.05%	1	N
84	Aug-06	1.89%	10.39%	82.85%	0	6.76%	1	C
85	Aug-07	37.23%	29.93%	49.55%	0	20.52%	1	N
86	Aug-07	25.59%	55.59%	40.69%	0	3.72%	1	N
87	Aug-07	55.79%	75.98%	13.91%	0	10.12%	1	N
88	Aug-07	9.11%	32.26%	54.68%	0	13.05%	1	C
89	Aug-07	50.24%	73.92%	19.32%	0	6.76%	1	N
90	Aug-07	32.92%	52.64%	47.36%	0	0.00%	1	C
91	Aug-07	99.76%	99.62%	0.38%	0	0.00%	1	N
92	Aug-07	3.30%	49.53%	39.55%	0	10.91%	1	C
93	Aug-07	99.73%	99.57%	0.11%	0	0.32%	1	N
94	Aug-08	14.59%	57.42%	39.49%	0	3.09%	1	C
95	Aug-08	81.64%	92.87%	4.67%	0	2.46%	1	N
96	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
112	Aug-08	51.80%	67.58%	32.42%	0	0.00%	1	C
113	Aug-08	18.49%	74.35%	25.65%	0	0.00%	1	N
114	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
116	Aug-08	23.16%	72.34%	27.66%	0	0.00%	1	C
117	Aug-08	60.37%	90.20%	9.80%	0	0.00%	1	N
118	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E11								
SedSeg#	Year to Remediate	% PCB Mass Remains	% sedseg area not remediated	% sedseg area capped	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	Aug-04	2.61%	1.89%	98.11%	0	0.00%	1	N
49	Aug-04	0.00%	0.00%	97.73%	0	2.27%	1	N
50	Aug-04	3.80%	2.77%	92.43%	0	4.81%	1	N
51	Aug-04	9.34%	3.30%	77.07%	0	19.63%	1	N
52	Aug-04	0.00%	0.00%	82.54%	0	17.46%	1	C
53	Aug-04	0.00%	0.00%	73.12%	0	26.88%	1	N
54	Aug-04	0.00%	0.00%	10.86%	0	89.14%	1	N
55	Aug-04	0.00%	0.00%	62.97%	0	37.03%	1	N
56	Aug-05	0.56%	0.56%	99.44%	0	0.00%	1	C
57	Aug-05	22.72%	5.23%	94.77%	0	0.00%	1	N
58	Aug-05	1.65%	3.63%	55.73%	0	40.64%	1	N
59	Aug-05	0.00%	0.00%	85.39%	0	14.61%	1	C
60	Aug-05	0.00%	0.00%	99.99%	0	0.01%	1	N
61	Aug-05	0.00%	0.00%	91.07%	0	8.93%	1	C
62	Aug-05	0.00%	0.00%	63.62%	0	36.38%	1	N
63	Aug-05	0.00%	0.00%	57.84%	0	42.16%	1	N
64	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	C
65	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	N
66	Aug-06	2.04%	2.04%	86.07%	0	11.89%	1	C
67	Aug-06	1.38%	1.00%	89.25%	0	9.75%	1	N
68	Aug-06	7.54%	7.54%	4.24%	0	88.22%	1	C
69	Aug-06	0.41%	1.71%	27.19%	0	71.10%	1	N
70	Aug-06	0.00%	0.00%	86.13%	0	13.87%	1	C
71	Aug-06	0.00%	0.00%	94.41%	0	5.59%	1	N
72	Aug-06	1.60%	1.60%	78.49%	0	19.91%	1	C
73	Aug-06	3.27%	2.38%	85.01%	0	12.61%	1	N
74	Aug-06	7.64%	7.60%	20.05%	0	72.36%	1	N
75	Aug-06	82.05%	41.30%	34.25%	0	24.45%	1	C
76	Aug-06	9.76%	7.22%	81.22%	0	11.56%	1	N
77	Aug-06	0.00%	0.00%	70.63%	0	29.37%	1	N
78	Aug-06	6.35%	6.35%	82.70%	0	10.95%	1	C
79	Aug-06	14.03%	7.41%	34.91%	0	57.68%	1	N
80	Aug-07	2.68%	2.68%	91.16%	0	6.16%	1	C
81	Aug-07	0.00%	0.00%	92.31%	0	7.69%	1	C
82	Aug-07	0.00%	0.00%	19.90%	0	80.10%	1	N
83	Aug-07	62.52%	10.92%	4.58%	0	84.49%	1	N
84	Aug-07	1.92%	8.71%	83.77%	0	7.52%	1	C
85	Aug-07	24.59%	19.01%	49.52%	0	31.47%	1	N
86	Aug-07	0.00%	0.00%	88.33%	0	11.67%	1	N
87	Aug-07	0.81%	0.59%	61.56%	0	37.85%	1	N
88	Aug-07	0.00%	0.00%	86.95%	0	13.05%	1	C
89	Aug-08	3.25%	2.36%	88.88%	0	8.75%	1	N
90	Aug-08	20.36%	29.14%	70.86%	0	0.00%	1	C
91	Aug-08	97.56%	96.98%	3.02%	0	0.00%	1	N
92	Aug-08	0.43%	19.53%	66.22%	0	14.26%	1	C
93	Aug-08	86.98%	93.05%	1.73%	0	5.21%	1	N
94	Aug-08	6.91%	38.55%	50.48%	0	10.97%	1	C
95	Aug-08	63.81%	87.77%	4.23%	0	8.00%	1	N
96	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
112	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
113	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
114	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E12								
SedSeg#	Year to Remediate	% PCB Mass Remains	% sedseg area not remediated	% sedseg area capped	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	Aug-04	2.61%	1.89%	98.11%	0	0.00%	1	N
49	Aug-04	0.00%	0.00%	97.73%	0	2.27%	1	N
50	Aug-04	3.80%	2.77%	92.43%	0	4.81%	1	N
51	Aug-04	9.34%	3.30%	77.07%	0	19.63%	1	N
52	Aug-04	0.00%	0.00%	82.54%	0	17.46%	1	C
53	Aug-04	0.00%	0.00%	73.12%	0	26.88%	1	N
54	Aug-05	0.00%	0.00%	10.86%	0	89.14%	1	N
55	Aug-05	0.00%	0.00%	62.97%	0	37.03%	1	N
56	Aug-05	0.56%	0.56%	99.44%	0	0.00%	1	C
57	Aug-05	22.72%	5.23%	94.77%	0	0.00%	1	N
58	Aug-05	1.65%	3.63%	55.73%	0	40.64%	1	N
59	Aug-05	0.00%	0.00%	85.39%	0	14.61%	1	C
60	Aug-05	0.00%	0.00%	99.99%	0	0.01%	1	N
61	Aug-05	0.00%	0.00%	91.07%	0	8.93%	1	C
62	Aug-05	0.00%	0.00%	63.62%	0	36.38%	1	N
63	Aug-06	0.00%	0.00%	57.84%	0	42.16%	1	N
64	Aug-06	0.00%	0.00%	100.00%	0	0.00%	1	C
65	Aug-06	0.00%	0.00%	100.00%	0	0.00%	1	N
66	Aug-06	2.04%	2.04%	86.07%	0	11.89%	1	C
67	Aug-06	1.38%	1.00%	89.25%	0	9.75%	1	N
68	Aug-06	7.54%	7.54%	4.24%	0	88.22%	1	C
69	Aug-06	0.41%	1.71%	27.19%	0	71.10%	1	N
70	Aug-06	0.00%	0.00%	86.13%	0	13.87%	1	C
71	Aug-07	0.00%	0.00%	94.41%	0	5.59%	1	N
72	Aug-07	1.60%	1.60%	78.49%	0	19.91%	1	C
73	Aug-07	3.27%	2.38%	85.01%	0	12.61%	1	N
74	Aug-07	7.64%	7.60%	20.05%	0	72.36%	1	N
75	Aug-07	82.05%	41.30%	34.25%	0	24.45%	1	C
76	Aug-07	9.76%	7.22%	81.22%	0	11.56%	1	N
77	Aug-07	0.00%	0.00%	70.63%	0	29.37%	1	N
78	Aug-07	6.35%	6.35%	82.70%	0	10.95%	1	C
79	Aug-07	14.03%	7.41%	34.91%	0	57.68%	1	N
80	Aug-07	2.68%	2.68%	91.16%	0	6.16%	1	C
81	Aug-07	0.00%	0.00%	92.31%	0	7.69%	1	C
82	Aug-07	0.00%	0.00%	19.90%	0	80.10%	1	N
83	Aug-08	62.52%	10.92%	4.58%	0	84.49%	1	N
84	Aug-08	1.92%	8.71%	83.77%	0	7.52%	1	C
85	Aug-08	24.59%	19.01%	49.52%	0	31.47%	1	N
86	Aug-08	0.00%	0.00%	88.33%	0	11.67%	1	N
87	Aug-08	0.81%	0.59%	61.56%	0	37.85%	1	N
88	Aug-08	0.00%	0.00%	86.95%	0	13.05%	1	C
89	Aug-08	3.25%	2.36%	88.88%	0	8.75%	1	N
90	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
91	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
92	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
93	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
94	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
95	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
96	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
112	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
113	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
114	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E13								
SedSeg#	Year to Remediate	% PCB Mass Remains	% sedseg area not remediated	% sedseg area capped	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	Aug-04	98.12%	88.60%	11.40%	0	0.00%	1	N
49	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
50	Aug-04	87.19%	73.83%	24.83%	0	1.34%	1	N
51	Aug-04	1.90%	23.74%	66.56%	0	9.70%	1	N
52	Aug-04	2.82%	20.12%	66.29%	0	13.59%	1	C
53	Aug-04	53.91%	54.80%	36.35%	0	8.85%	1	N
54	Aug-04	69.63%	60.89%	7.31%	0	31.81%	1	N
55	Aug-04	95.29%	93.51%	5.31%	0	1.18%	1	N
56	Aug-04	0.60%	0.60%	99.40%	0	0.00%	1	C
57	Aug-05	22.66%	5.33%	94.67%	0	0.00%	1	N
58	Aug-05	1.65%	3.64%	55.71%	0	40.64%	1	N
59	Aug-05	0.00%	0.00%	85.39%	0	14.61%	1	C
60	Aug-05	0.00%	0.00%	99.99%	0	0.01%	1	N
61	Aug-05	2.57%	15.22%	76.59%	0	8.19%	1	C
62	Aug-05	62.53%	71.16%	28.60%	0	0.24%	1	N
63	Aug-06	36.96%	41.45%	40.94%	0	17.61%	1	N
64	Aug-06	0.00%	0.00%	100.00%	0	0.00%	1	C
65	Aug-06	0.00%	0.00%	100.00%	0	0.00%	1	N
66	Aug-06	36.79%	60.34%	39.54%	0	0.13%	1	C
67	Aug-06	47.92%	74.63%	25.37%	0	0.00%	1	N
68	Aug-06	15.94%	55.70%	4.24%	0	40.05%	1	C
69	Aug-06	63.12%	71.95%	12.64%	0	15.41%	1	N
70	Aug-06	0.00%	0.00%	86.12%	0	13.87%	1	C
71	Aug-07	0.00%	0.00%	94.80%	0	5.20%	1	N
72	Aug-07	6.03%	14.61%	75.06%	0	10.32%	1	C
73	Aug-07	6.56%	18.69%	73.18%	0	8.13%	1	N
74	Aug-07	45.86%	48.88%	12.38%	0	38.74%	1	N
75	Aug-07	63.78%	57.52%	33.95%	0	8.53%	1	C
76	Aug-07	17.59%	23.46%	66.04%	0	10.49%	1	N
77	Aug-07	21.03%	57.62%	35.13%	0	7.25%	1	N
78	Aug-07	7.09%	7.09%	82.66%	0	10.25%	1	C
79	Aug-07	66.15%	60.67%	30.34%	0	8.99%	1	N
80	Aug-07	5.07%	5.06%	90.37%	0	4.56%	1	C
81	Aug-08	3.94%	34.48%	59.67%	0	5.85%	1	C
82	Aug-08	93.25%	69.75%	9.94%	0	20.31%	1	N
83	Aug-08	94.68%	69.64%	3.31%	0	27.05%	1	N
84	Aug-08	1.89%	10.39%	82.85%	0	6.76%	1	C
85	Aug-08	37.23%	29.93%	49.55%	0	20.52%	1	N
86	Aug-08	25.59%	55.59%	40.69%	0	3.72%	1	N
87	Aug-08	55.79%	75.98%	13.91%	0	10.12%	1	N
88	Aug-08	9.11%	32.26%	54.68%	0	13.05%	1	C
89	Aug-08	50.24%	73.92%	19.32%	0	6.76%	1	N
90	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
91	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
92	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
93	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
94	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
95	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
96	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
112	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
113	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
114	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E14								
SedSeg#	Year to Remediate	% PCB Mass Remains	% sedseg area not remediated	% sedseg area capped	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	Aug-04	2.61%	1.89%	98.11%	0	0.00%	1	N
49	Aug-04	0.00%	0.00%	97.73%	0	2.27%	1	N
50	Aug-04	3.80%	2.77%	92.43%	0	4.81%	1	N
51	Aug-04	9.34%	3.30%	77.07%	0	19.63%	1	N
52	Aug-04	0.00%	0.00%	82.54%	0	17.46%	1	C
53	Aug-04	0.00%	0.00%	73.12%	0	26.88%	1	N
54	Aug-04	0.00%	0.00%	10.86%	0	89.14%	1	N
55	Aug-04	0.00%	0.00%	62.97%	0	37.03%	1	N
56	Aug-04	0.56%	0.56%	99.44%	0	0.00%	1	C
57	Aug-04	22.72%	5.23%	94.77%	0	0.00%	1	N
58	Aug-04	1.65%	3.63%	55.73%	0	40.64%	1	N
59	Aug-05	0.00%	0.00%	85.39%	0	14.61%	1	C
60	Aug-05	0.00%	0.00%	99.99%	0	0.01%	1	N
61	Aug-05	0.00%	0.00%	91.07%	0	8.93%	1	C
62	Aug-05	0.00%	0.00%	63.62%	0	36.38%	1	N
63	Aug-05	0.00%	0.00%	57.84%	0	42.16%	1	N
64	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	C
65	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	N
66	Aug-05	2.04%	2.04%	86.07%	0	11.89%	1	C
67	Aug-05	1.38%	1.00%	89.25%	0	9.75%	1	N
68	Aug-05	7.54%	7.54%	4.24%	0	88.22%	1	C
69	Aug-05	0.41%	1.71%	27.19%	0	71.10%	1	N
70	Aug-05	0.00%	0.00%	86.13%	0	13.87%	1	C
71	Aug-05	0.00%	0.00%	94.41%	0	5.59%	1	N
72	Aug-05	1.60%	1.60%	78.49%	0	19.91%	1	C
73	Aug-05	3.27%	2.38%	85.01%	0	12.61%	1	N
74	Aug-05	7.64%	7.60%	20.05%	0	72.36%	1	N
75	Aug-06	82.05%	41.30%	34.25%	0	24.45%	1	C
76	Aug-06	9.76%	7.22%	81.22%	0	11.56%	1	N
77	Aug-06	0.00%	0.00%	70.63%	0	29.37%	1	N
78	Aug-06	6.35%	6.35%	82.70%	0	10.95%	1	C
79	Aug-06	14.03%	7.41%	34.91%	0	57.68%	1	N
80	Aug-06	2.68%	2.68%	91.16%	0	6.16%	1	C
81	Aug-06	0.00%	0.00%	92.31%	0	7.69%	1	C
82	Aug-06	0.00%	0.00%	19.90%	0	80.10%	1	N
83	Aug-06	62.52%	10.92%	4.58%	0	84.49%	1	N
84	Aug-06	1.92%	8.71%	83.77%	0	7.52%	1	C
85	Aug-06	24.59%	19.01%	49.52%	0	31.47%	1	N
86	Aug-06	0.00%	0.00%	88.33%	0	11.67%	1	N
87	Aug-06	0.81%	0.59%	61.56%	0	37.85%	1	N
88	Aug-06	0.00%	0.00%	86.95%	0	13.05%	1	C
89	Aug-06	3.25%	2.36%	88.88%	0	8.75%	1	N
90	Aug-07	11.59%	11.59%	88.41%	0	0.00%	1	C
91	Aug-07	7.05%	5.18%	94.82%	0	0.00%	1	N
92	Aug-07	5.10%	5.10%	74.01%	0	20.88%	1	C
93	Aug-08	8.59%	6.34%	43.36%	0	50.31%	1	N
94	Aug-08	2.01%	2.01%	78.35%	0	19.64%	1	C
95	Aug-08	7.79%	5.73%	12.10%	0	82.17%	1	N
96	Aug-08	98.19%	97.51%	1.28%	0	1.22%	1	N
97	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
112	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
113	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
114	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E15								
SedSeg#	Year to Remediate	% PCB Mass Remains	% sedseg area not remediated	% sedseg area capped	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	Aug-04	98.12%	88.60%	11.40%	0	0.00%	1	N
49	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
50	Aug-04	87.19%	73.83%	24.83%	0	1.34%	1	N
51	Aug-04	1.90%	23.74%	66.56%	0	9.70%	1	N
52	Aug-04	2.82%	20.12%	66.29%	0	13.59%	1	C
53	Aug-04	53.91%	54.80%	36.35%	0	8.85%	1	N
54	Aug-04	69.63%	60.89%	7.31%	0	31.81%	1	N
55	Aug-04	95.29%	93.51%	5.31%	0	1.18%	1	N
56	Aug-04	0.60%	0.60%	99.40%	0	0.00%	1	C
57	Aug-04	22.66%	5.33%	94.67%	0	0.00%	1	N
58	Aug-04	1.65%	3.64%	55.71%	0	40.64%	1	N
59	Aug-05	0.00%	0.00%	85.39%	0	14.61%	1	C
60	Aug-05	0.00%	0.00%	99.99%	0	0.01%	1	N
61	Aug-05	2.57%	15.22%	76.59%	0	8.19%	1	C
62	Aug-05	62.53%	71.16%	28.60%	0	0.24%	1	N
63	Aug-05	36.96%	41.45%	40.94%	0	17.61%	1	N
64	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	C
65	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	N
66	Aug-05	36.79%	60.34%	39.54%	0	0.13%	1	C
67	Aug-05	47.92%	74.63%	25.37%	0	0.00%	1	N
68	Aug-05	15.94%	55.70%	4.24%	0	40.05%	1	C
69	Aug-05	63.12%	71.95%	12.64%	0	15.41%	1	N
70	Aug-06	0.00%	0.00%	86.12%	0	13.87%	1	C
71	Aug-06	0.00%	0.00%	94.80%	0	5.20%	1	N
72	Aug-06	6.03%	14.61%	75.06%	0	10.32%	1	C
73	Aug-06	6.56%	18.69%	73.18%	0	8.13%	1	N
74	Aug-06	45.86%	48.88%	12.38%	0	38.74%	1	N
75	Aug-06	63.78%	57.52%	33.95%	0	8.53%	1	C
76	Aug-06	17.59%	23.46%	66.04%	0	10.49%	1	N
77	Aug-06	21.03%	57.62%	35.13%	0	7.25%	1	N
78	Aug-06	7.09%	7.09%	82.66%	0	10.25%	1	C
79	Aug-06	66.15%	60.67%	30.34%	0	8.99%	1	N
80	Aug-06	5.07%	5.06%	90.37%	0	4.56%	1	C
81	Aug-06	3.94%	34.48%	59.67%	0	5.85%	1	C
82	Aug-06	93.25%	69.75%	9.94%	0	20.31%	1	N
83	Aug-06	94.68%	69.64%	3.31%	0	27.05%	1	N
84	Aug-07	1.89%	10.39%	82.85%	0	6.76%	1	C
85	Aug-07	37.23%	29.93%	49.55%	0	20.52%	1	N
86	Aug-07	25.59%	55.59%	40.69%	0	3.72%	1	N
87	Aug-07	55.79%	75.98%	13.91%	0	10.12%	1	N
88	Aug-07	9.11%	32.26%	54.68%	0	13.05%	1	C
89	Aug-07	50.24%	73.92%	19.32%	0	6.76%	1	N
90	Aug-07	20.36%	29.14%	70.86%	0	0.00%	1	C
91	Aug-07	97.56%	96.98%	3.02%	0	0.00%	1	N
92	Aug-08	0.43%	19.53%	66.22%	0	14.26%	1	C
93	Aug-08	86.98%	93.05%	1.73%	0	5.21%	1	N
94	Aug-08	6.91%	38.55%	50.48%	0	10.97%	1	C
95	Aug-08	63.81%	87.77%	4.23%	0	8.00%	1	N
96	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
112	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
113	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
114	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E16					
SedSeg#	Year to Remediate	% PCB Mass Remains to LTI	% sedseg area not remediated	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	2.61%	1.89%	N	0.5
49	Aug-04	0.00%	0.00%	N	0.5
50	Aug-04	3.80%	2.77%	N	0.5
51	Aug-04	9.34%	3.30%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	0.00%	0.00%	N	0.5
54	Aug-04	0.00%	0.00%	N	0.5
55	Aug-05	0.00%	0.00%	N	0.5
56	Aug-05	0.56%	0.56%	C	0.25
57	Aug-05	22.72%	5.23%	N	0.5
58	Aug-05	1.65%	3.63%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	0.00%	0.00%	C	0.25
62	Aug-05	0.00%	0.00%	N	0.5
63	Aug-05	0.00%	0.00%	N	0.5
64	Aug-06	0.00%	0.00%	C	0.25
65	Aug-06	0.00%	0.00%	N	0.5
66	Aug-06	2.04%	2.04%	C	0.25
67	Aug-06	1.38%	1.00%	N	0.5
68	Aug-06	7.54%	7.54%	C	0.25
69	Aug-06	0.41%	1.71%	N	0.5
70	Aug-06	0.00%	0.00%	C	0.25
71	Aug-06	0.00%	0.00%	N	0.5
72	Aug-06	1.60%	1.60%	C	0.25
73	Aug-06	3.27%	2.38%	N	0.5
74	Aug-06	7.64%	7.60%	N	0.5
75	Aug-06	82.05%	41.30%	C	0.25
76	Aug-06	9.76%	7.22%	N	0.5
77	Aug-07	0.00%	0.00%	N	0.5
78	Aug-07	6.35%	6.35%	C	0.25
79	Aug-07	14.03%	7.41%	N	0.5
80	Aug-07	2.68%	2.68%	C	0.25
81	Aug-07	0.00%	0.00%	C	0.25
82	Aug-07	0.00%	0.00%	N	0.5
83	Aug-07	62.52%	10.92%	N	0.5
84	Aug-07	1.92%	8.71%	C	0.25
85	Aug-07	24.59%	19.01%	N	0.5
86	Aug-07	0.00%	0.00%	N	0.5
87	Aug-07	0.81%	0.59%	N	0.5
88	Aug-08	0.00%	0.00%	C	0.25
89	Aug-08	3.25%	2.36%	N	0.5
90	Aug-08	32.92%	52.64%	C	0.25
91	Aug-08	99.76%	99.62%	N	0.5
92	Aug-08	3.30%	49.53%	C	0.25
93	Aug-08	99.73%	99.57%	N	0.5
94	Aug-08	14.59%	57.42%	C	0.25
95	Aug-08	81.64%	92.87%	N	0.5
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	No Change	No Change	No Change	No Change	No Change
113	No Change	No Change	No Change	No Change	No Change
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E17

SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	2.61%	1.89%	N	0.5
49	Aug-04	0.00%	0.00%	N	0.5
50	Aug-04	3.80%	2.77%	N	0.5
51	Aug-04	9.34%	3.30%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	0.00%	0.00%	N	0.5
54	Aug-04	0.00%	0.00%	N	0.5
55	Aug-04	0.00%	0.00%	N	0.5
56	Aug-04	0.56%	0.56%	C	0.25
57	Aug-04	22.72%	5.23%	N	0.5
58	Aug-05	1.65%	3.63%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	0.00%	0.00%	C	0.25
62	Aug-05	0.00%	0.00%	N	0.5
63	Aug-05	0.00%	0.00%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	0.00%	0.00%	N	0.5
66	Aug-05	2.04%	2.04%	C	0.25
67	Aug-05	1.38%	1.00%	N	0.5
68	Aug-05	7.54%	7.54%	C	0.25
69	Aug-05	0.41%	1.71%	N	0.5
70	Aug-05	0.00%	0.00%	C	0.25
71	Aug-05	0.00%	0.00%	N	0.5
72	Aug-06	1.60%	1.60%	C	0.25
73	Aug-06	3.27%	2.38%	N	0.5
74	Aug-06	7.64%	7.60%	N	0.5
75	Aug-06	82.05%	41.30%	C	0.25
76	Aug-06	36.65%	7.22%	N	0.5
77	Aug-06	0.00%	0.00%	N	0.5
78	Aug-06	6.35%	6.35%	C	0.25
79	Aug-06	14.03%	7.41%	N	0.5
80	Aug-06	1.59%	2.68%	C	0.25
81	Aug-06	0.00%	0.00%	C	0.25
82	Aug-06	0.00%	0.00%	N	0.5
83	Aug-06	62.52%	10.92%	N	0.5
84	Aug-06	1.92%	8.71%	C	0.25
85	Aug-06	24.59%	19.01%	N	0.5
86	Aug-06	0.00%	0.00%	N	0.5
87	Aug-06	0.81%	0.59%	N	0.5
88	Aug-07	0.00%	0.00%	C	0.25
89	Aug-07	3.25%	2.36%	N	0.5
90	Aug-07	32.92%	52.64%	C	0.25
91	Aug-07	99.76%	99.62%	N	0.5
92	Aug-07	3.30%	49.53%	C	0.25
93	Aug-07	99.73%	99.57%	N	0.5
94	Aug-07	14.59%	57.42%	C	0.25
95	Aug-08	81.64%	92.87%	N	0.5
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	Aug-08	51.80%	67.58%	C	0.25
113	Aug-08	18.49%	74.35%	N	0.5
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	Aug-08	23.16%	72.34%	C	0.25
117	Aug-08	60.37%	90.20%	N	0.5
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

INPUT GIVEN TO LTI FOR ENGINEERING SCENARIO E18

SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not remediated	% sedseg area capped	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	Aug-04	2.61%	1.89%	98.11%	0	0.00%	1	N
49	Aug-04	0.00%	0.00%	97.73%	0	2.27%	1	N
50	Aug-04	3.80%	2.77%	92.43%	0	4.81%	1	N
51	Aug-04	9.34%	3.30%	77.07%	0	19.63%	1	N
52	Aug-04	0.00%	0.00%	82.54%	0	17.46%	1	C
53	Aug-04	0.00%	0.00%	73.12%	0	26.88%	1	N
54	Aug-04	0.00%	0.00%	10.86%	0	89.14%	1	N
55	Aug-04	0.00%	0.00%	62.97%	0	37.03%	1	N
56	Aug-04	0.56%	0.56%	99.44%	0	0.00%	1	C
57	Aug-04	22.72%	5.23%	94.77%	0	0.00%	1	N
58	Aug-05	1.65%	3.63%	55.73%	0	40.64%	1	N
59	Aug-05	0.00%	0.00%	85.39%	0	14.61%	1	C
60	Aug-05	0.00%	0.00%	99.99%	0	0.01%	1	N
61	Aug-05	0.00%	0.00%	91.07%	0	8.93%	1	C
62	Aug-05	0.00%	0.00%	63.62%	0	36.38%	1	N
63	Aug-05	0.00%	0.00%	57.84%	0	42.16%	1	N
64	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	C
65	Aug-05	0.00%	0.00%	100.00%	0	0.00%	1	N
66	Aug-05	2.04%	2.04%	86.07%	0	11.89%	1	C
67	Aug-05	1.38%	1.00%	89.25%	0	9.75%	1	N
68	Aug-05	7.54%	7.54%	4.24%	0	88.22%	1	C
69	Aug-05	0.41%	1.71%	27.19%	0	71.10%	1	N
70	Aug-05	0.00%	0.00%	86.13%	0	13.87%	1	C
71	Aug-05	0.00%	0.00%	94.41%	0	5.59%	1	N
72	Aug-06	1.60%	1.60%	78.49%	0	19.91%	1	C
73	Aug-06	3.27%	2.38%	85.01%	0	12.61%	1	N
74	Aug-06	7.64%	7.60%	20.05%	0	72.36%	1	N
75	Aug-06	82.05%	41.30%	34.25%	0	24.45%	1	C
76	Aug-06	9.76%	7.22%	81.22%	0	11.56%	1	N
77	Aug-06	0.00%	0.00%	70.63%	0	29.37%	1	N
78	Aug-06	6.35%	6.35%	82.70%	0	10.95%	1	C
79	Aug-06	14.03%	7.41%	34.91%	0	57.68%	1	N
80	Aug-06	2.68%	2.68%	91.16%	0	6.16%	1	C
81	Aug-06	0.00%	0.00%	92.31%	0	7.69%	1	C
82	Aug-06	0.00%	0.00%	19.90%	0	80.10%	1	N
83	Aug-06	62.52%	10.92%	4.58%	0	84.49%	1	N
84	Aug-06	1.92%	8.71%	83.77%	0	7.52%	1	C
85	Aug-06	24.59%	19.01%	49.52%	0	31.47%	1	N
86	Aug-06	0.00%	0.00%	88.33%	0	11.67%	1	N
87	Aug-06	0.81%	0.59%	61.56%	0	37.85%	1	N
88	Aug-07	0.00%	0.00%	86.95%	0	13.05%	1	C
89	Aug-07	3.25%	2.36%	88.88%	0	8.75%	1	N
90	Aug-07	32.92%	52.64%	47.36%	0	0.00%	1	C
91	Aug-07	99.76%	99.62%	0.38%	0	0.00%	1	N
92	Aug-07	3.30%	49.53%	39.55%	0	10.91%	1	C
93	Aug-07	99.73%	99.57%	0.11%	0	0.32%	1	N
94	Aug-07	14.59%	57.42%	39.49%	0	3.09%	1	C
95	Aug-08	81.64%	92.87%	4.67%	0	2.46%	1	N
96	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
112	Aug-08	51.80%	67.58%	32.42%	0	0.00%	1	C
113	Aug-08	18.49%	74.35%	25.65%	0	0.00%	1	N
114	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
116	Aug-08	23.16%	72.34%	27.66%	0	0.00%	1	C
117	Aug-08	60.37%	90.20%	9.80%	0	0.00%	1	N
118	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change

Sediment Capping Sensitivity Analysis Input to LTI - Second Set of Input (5, 10, and 25% of capped area missing)

Input Same as For Scenario E8 Except for Highlighted Columns

SedSeg#	Year to Remediate	% PCB Mass Remains	% PCB Mass Remains to LTI (5% of cap area breached)	% PCB Mass Remains to LTI (10% of cap area breached)	% PCB Mass Remains to LTI (25% of cap area breached)	% sedseg area not remediated	% sedseg area not remediated (5% of cap area breached)	% sedseg area not remediated (10% of cap area breached)	% sedseg area not remediated (25% of cap area breached)	% sedseg area capped	% sedseg area capped (5% of cap area breached)	% sedseg area capped (10% of cap area breached)	% sedseg area capped (25% of cap area breached)	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged	% sedseg area dredged (5% of cap area breached)	% sedseg area dredged (10% of cap area breached)	% sedseg area dredged (25% of cap area breached)	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	Aug-04	98.12%	98.12%	98.38%	98.63%	88.60%	88.60%	90.14%	91.65%	11.40%	11.40%	9.86%	8.35%	0	0.00%	0.00%	0.00%	0.00%	1	N
49	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
50	Aug-04	87.19%	87.99%	87.99%	88.87%	73.83%	75.65%	75.65%	77.66%	24.83%	23.01%	23.01%	21.00%	0	1.34%	1.34%	1.34%	1.34%	1	N
51	Aug-04	1.90%	3.79%	5.45%	9.02%	23.74%	31.28%	38.01%	52.65%	66.56%	59.02%	52.29%	37.65%	0	9.70%	9.70%	9.70%	9.70%	1	N
52	Aug-04	2.82%	10.28%	10.30%	18.25%	20.12%	29.67%	29.69%	39.86%	66.29%	56.75%	56.73%	46.56%	0	13.59%	13.59%	13.59%	13.59%	1	C
53	Aug-04	53.91%	69.18%	74.56%	81.46%	54.80%	66.08%	70.35%	76.06%	36.35%	25.07%	20.80%	15.09%	0	8.85%	8.85%	8.85%	8.85%	1	N
54	Aug-04	69.63%	69.95%	70.46%	70.51%	60.89%	61.88%	63.45%	63.63%	7.31%	6.31%	4.74%	4.56%	0	31.81%	31.81%	31.81%	31.81%	1	N
55	Aug-04	95.29%	95.29%	95.29%	95.29%	93.51%	93.51%	93.51%	93.51%	5.31%	5.31%	5.31%	5.31%	0	1.18%	1.18%	1.18%	1.18%	1	N
56	Aug-04	0.60%	4.33%	15.92%	45.67%	0.60%	4.73%	17.57%	50.53%	99.40%	95.27%	82.43%	49.47%	0	0.00%	0.00%	0.00%	0.00%	1	C
57	Aug-04	22.66%	27.22%	36.25%	63.60%	5.33%	10.86%	22.25%	61.07%	94.67%	89.14%	77.75%	38.93%	0	0.00%	0.00%	0.00%	0.00%	1	N
58	Aug-04	1.65%	10.40%	16.07%	29.83%	3.64%	10.79%	15.62%	28.03%	55.71%	48.57%	43.74%	31.32%	0	40.64%	40.64%	40.64%	40.64%	1	N
59	Aug-04	0.00%	0.00%	0.00%	3.97%	0.00%	0.00%	0.00%	3.97%	85.39%	85.39%	85.39%	81.43%	0	14.61%	14.61%	14.61%	14.61%	1	C
60	Aug-04	0.00%	6.74%	6.74%	34.32%	0.00%	4.75%	4.75%	26.25%	99.99%	95.24%	95.24%	73.74%	0	0.01%	0.01%	0.01%	0.01%	1	N
61	Aug-04	2.57%	10.71%	10.71%	10.71%	15.22%	22.30%	22.30%	22.30%	76.59%	69.51%	69.51%	69.51%	0	8.19%	8.19%	8.19%	8.19%	1	C
62	Aug-04	62.53%	64.67%	70.56%	84.40%	71.16%	72.58%	76.61%	86.75%	28.60%	27.18%	23.15%	13.01%	0	0.24%	0.24%	0.24%	0.24%	1	N
63	Aug-05	36.96%	40.83%	47.06%	59.40%	41.45%	45.47%	52.14%	66.18%	40.94%	36.92%	30.25%	16.21%	0	17.61%	17.61%	17.61%	17.61%	1	N
64	Aug-05	0.00%	1.87%	17.18%	50.85%	0.00%	1.50%	13.79%	40.80%	100.00%	98.50%	86.21%	59.20%	0	0.00%	0.00%	0.00%	0.00%	1	C
65	Aug-05	0.00%	29.32%	51.08%	76.92%	0.00%	19.76%	36.86%	60.64%	100.00%	80.24%	63.14%	39.36%	0	0.00%	0.00%	0.00%	0.00%	1	N
66	Aug-05	36.79%	42.04%	57.52%	70.25%	60.34%	62.95%	70.68%	77.04%	39.54%	36.92%	29.19%	22.84%	0	0.13%	0.13%	0.13%	0.13%	1	C
67	Aug-05	47.92%	52.50%	56.67%	71.52%	74.63%	76.51%	78.27%	84.98%	25.37%	23.49%	21.73%	15.02%	0	0.00%	0.00%	0.00%	0.00%	1	N
68	Aug-05	15.94%	19.07%	19.07%	19.07%	55.70%	57.23%	57.23%	57.23%	4.24%	2.72%	2.72%	2.72%	0	40.05%	40.05%	40.05%	40.05%	1	C
69	Aug-05	63.12%	65.62%	67.91%	77.43%	71.95%	73.03%	74.04%	78.41%	12.64%	11.56%	10.55%	6.18%	0	15.41%	15.41%	15.41%	15.41%	1	N
70	Aug-05	0.00%	5.75%	16.98%	29.53%	0.00%	8.14%	24.02%	41.79%	86.12%	77.99%	62.10%	44.34%	0	13.87%	13.87%	13.87%	13.87%	1	C
71	Aug-05	0.00%	25.63%	46.13%	68.16%	0.00%	19.86%	38.11%	60.60%	94.80%	74.94%	56.69%	34.21%	0	5.20%	5.20%	5.20%	5.20%	1	N
72	Aug-05	6.03%	20.20%	34.15%	52.12%	14.61%	27.84%	40.85%	57.62%	75.06%	61.84%	48.83%	32.06%	0	10.32%	10.32%	10.32%	10.32%	1	C
73	Aug-05	6.56%	9.16%	16.44%	39.71%	18.69%	20.20%	24.53%	39.72%	73.18%	71.67%	67.34%	52.15%	0	8.13%	8.13%	8.13%	8.13%	1	N
74	Aug-05	45.86%	46.21%	46.40%	49.23%	48.88%	49.30%	49.53%	53.00%	12.38%	11.96%	11.73%	8.25%	0	38.74%	38.74%	38.74%	38.74%	1	N
75	Aug-05	63.78%	63.78%	63.80%	64.80%	57.52%	57.53%	57.64%	65.30%	33.95%	33.95%	33.83%	26.17%	0	8.53%	8.53%	8.53%	8.53%	1	C
76	Aug-05	17.59%	27.27%	34.50%	63.97%	23.46%	30.49%	36.01%	61.34%	66.04%	59.01%	53.49%	28.17%	0	10.49%	10.49%	10.49%	10.49%	1	N
77	Aug-05	21.03%	21.03%	21.03%	23.19%	57.62%	57.62%	57.62%	59.21%	35.13%	35.13%	35.13%	33.55%	0	7.25%	7.25%	7.25%	7.25%	1	N
78	Aug-05	7.09%	7.80%	17.19%	46.98%	7.09%	7.87%	18.17%	50.88%	82.66%	81.88%	71.58%	38.87%	0	10.25%	10.25%	10.25%	10.25%	1	C
79	Aug-05	66.15%	71.61%	73.47%	85.63%	60.67%	66.08%	67.98%	80.98%	30.34%	24.93%	23.04%	10.03%	0	8.99%	8.99%	8.99%	8.99%	1	N
80	Aug-05	5.07%	22.50%	30.40%	72.07%	5.06%	21.07%	28.31%	66.55%	90.37%	74.37%	67.13%	28.89%	0	4.56%	4.56%	4.56%	4.56%	1	C
81	Aug-06	3.94%	6.79%	10.89%	22.24%	34.48%	36.30%	38.91%	46.13%	59.67%	57.85%	55.24%	48.02%	0	5.85%	5.85%	5.85%	5.85%	1	C
82	Aug-06	93.25%	93.25%	93.25%	93.25%	69.75%	69.75%	69.75%	69.75%	9.94%	9.94%	9.94%	9.94%	0	20.31%	20.31%	20.31%	20.31%	1	N
83	Aug-06	94.68%	94.74%	94.74%	94.77%	69.64%	70.48%	70.59%	70.98%	3.31%	2.47%	2.36%	1.97%	0	27.05%	27.05%	27.05%	27.05%	1	N
84	Aug-06	1.89%	14.23%	18.22%	45.77%	10.39%	20.31%	23.52%	45.66%	82.85%	72.93%	69.72%	47.58%	0	6.76%	6.76%	6.76%	6.76%	1	C
85	Aug-06	37.23%	37.99%	37.99%	37.99%	29.93%	30.76%	30.76%	30.76%	49.55%	48.72%	48.72%	48.72%	0	20.52%	20.52%	20.52%	20.52%	1	N
86	Aug-06	25.59%	29.10%	37.50%	58.94%	55.59%	57.67%	62.84%	77.36%	40.69%	38.61%	33.44%	18.93%	0	3.72%	3.72%	3.72%	3.72%	1	N
87	Aug-06	55.79%	60.93%	62.94%	68.18%	75.98%	78.38%	79.35%	81.92%	13.91%	11.50%	10.54%	7.96%	0	10.12%	10.12%	10.12%	10.12%	1	N
88	Aug-06	9.11%	16.61%	19.14%	48.12%	32.26%	37.40%	39.13%	58.99%	54.68%	49.55%	47.81%	27.96%	0	13.05%	13.05%	13.05%	13.05%	1	C
89	Aug-06	50.24%	55.34%	55.34%	62.83%	73.92%	76.71%	76.71%	80.98%	19.32%	16.54%	16.54%	12.26%	0	6.76%	6.76%	6.76%	6.76%	1	N
90	Aug-06	20.36%	21.35%	22.17%	29.84%	29.14%	30.07%	30.85%	38.09%	70.86%	69.93%	69.15%	61.91%	0	0.00%	0.00%	0.00%	0.00%	1	C
91	Aug-06	97.56%	97.56%	97.56%	97.97%	96.98%	96.98%	96.98%	97.49%	3.02%	3.02%	3.02%	2.51%	0	0.00%	0.00%	0.00%	0.00%	1	N
92	Aug-06	0.43%	0.48%	0.83%	2.04%	19.53%	19.71%	20.95%	25.29%	66.22%	66.04%	64.80%	60.45%	0	14.26%	14.26%	14.26%	14.26%	1	C
93	Aug-07	86.98%	86.98%	86.98%	86.98%	93.05%	93.05%	93.05%	93.05%	1.73%	1.73%	1.73%	1.73%	0	5.21%	5.21%	5.21%	5.21%	1	N
94	Aug-07	6.91%	9.54%	12.91%	22.50%	38.55%	39.62%	40.99%	44.90%	50.48%	49.41%	48.04%	44.13%	0	10.97%	10.97%	10.97%	10.97%	1	C
95	Aug-07	63.81%	67.75%	67.75%	72.56%	87.77%	88.26%	88.26%	88.88%	4.23%	3.74%	3.74%	3.12%	0	8.00%	8.00%	8.00%	8.00%	1	N
96	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
102	Aug-07	86.58%	86.58%	86.58%	86.86%	90.25%	90.25%	90.25%	90.50%	9.75%	9.75%	9.75%	9.50%	0	0.00%	0.00%	0.00%	0.00%	1	C
103	Aug-07	90.07%	90.07%	90.07%	90.20%	97.57%	97.57%	97.57%	97.67%	0.93%	0.93%	0.93%	0.83%	0	1.50%	1.50%	1.50%	1.50%	1	N
104	Aug-07	85.30%	85.30%	85.30%	85.30%	97.21%	97.21%	97.21%	97.21%	2.79%	2.79%	2.79%	2.79%	0	0.00%	0.00%	0.00%	0.00%	1	C
105	Aug-07	99.17%	99.17%	99.17%	99.31%	99.66%	99.66%	99.66%	99.70%	0.30%	0.30%	0.30%	0.26%	0	0.04%	0.04%	0.04%	0.04%	1	N
106	Aug-07	31.16%	33.09%	34.92%	44.81%	32.77%	33.22%	33.65%	35.97%	65.63%	65.18%	64.75%	62.43%	0	1.60%	1.60%	1.60%	1.60%	1	C
107	Aug-08	86.25%	86.25%	86.25%	117.81%	96.81%	96.81%	96.81%	97.72%	3.19%	3.19%	3.19%	2.28%	0	0.00%	0.00%	0.00%	0.00%	1	N
108	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
112	Aug-08	21.28%	24.39%	24.39%	24.69%	67.58%	68.36%	68.36%	68.44%	32.42%	31.64%	31.64%	31.56%	0	0.00%	0.00%	0.00%	0.00%	1	C
113	Aug-08	12.15%	18.93%	18.93%	35.14%	74.36%	74.90%	74.90%	76.29%	25.64%	25.10%	25.10%	23.71%	0	0.00%	0.00%	0.00%	0.00%	1	N
114	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
116	Aug-08	23.62%	23.62%	23.62%	23.62%	72.86%	72.86%	72.86%	72.86%	27.14%	27.14%	27.14%	27.14%	0	0.00%	0.00%	0.00%	0.00%	1	C
117	Aug-08	32.01%	32.01%	32.43%	34.29%	68.82%	68.82%	68.94%	69.47%	30.25%	30.25%	30.13%	29.60%	0	0.93%	0.93%	0.93%	0.93%	1	N
118	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change

HUDSON RIVER PCBs REASSESSMENT FS
Refined Engineering Modeling Scenarios Input Specifications

The procedure used to specify input to HUDTOX for the Refined engineering modeling scenarios are described in this section. The input tables are also provided for these scenarios in this section.

As with the Engineering modeling effort, actual potential remedial alternatives were modeled in this phase of the modeling. The primary difference between the refined engineering modeling and previous modeling runs is the change from a constant upstream boundary water column concentration to a PCB mass loading upstream boundary condition.

Two different upstream load conditions (i.e., Rogers Island boundary condition) were evaluated. The first upstream load condition assumes a load of 0.16 kg/day throughout the modeled period (1998 to 2068). The second upstream load condition assumes a load of 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005.

Another difference between the Refined engineering modeling and previous modeling effort is the way percent PCB mass removal was calculated in River Section 1 for some of the scenarios.

For River Sections 2 and 3, initial average MPA conditions were calculated for a given segment by averaging the MPA of each point within the segment; this approach assumes that each point contributes equally to the initial conditions of the segment; none is more heavily weighted than the others. The average MPA was then recalculated for the segment (assuming removal of those points that fall within the target MPA area) by averaging the MPA of each remaining point. The average calculated MPA was multiplied by the associated area to get the mass of PCBs. One minus the ratio of the recalculated MPA to the initial condition MPA represents the percent mass removed for the segment during remediation. This calculated percent mass removed is assumed to be representative of the sediment segment. A PCB percent mass removed associated with the removal was provided for each sediment segment.

For River Section 1 (Thompson Island Pool), PCB percent mass removal was calculated as described above for the 15 of the refined engineering model runs. For the remaining model runs, total PCB mass, PCB mass removed (i.e., PCB mass in areas targeted for removal), and PCB mass remaining (i.e., PCB mass in areas not targeted for removal) were calculated for each segment by using the Thiessen polygon area weighted MPAs. The PCB mass values were used to calculate PCB percent mass removed for each sediment segment.

Description of Engineering Level Modeling Removal Scenarios

A brief description of the engineering level removal scenarios that were modeled appears in the following text. The corresponding name of the potential remedial alternative is included in parentheses.

Scenario R01CW (REM-0/0/3). This scenario represents the most aggressive removal action for the Upper Hudson. All sediments (the full river section corresponding to MPA greater than 0 g/m^2 Tri+ PCBs) in dredgeable areas are removed from Rogers Island to Northumberland Dam to predetermined elevations. Below Northumberland Dam, an MPA target of greater than 3 g/m^2 Tri+ PCBs was selected as the minimum target area criterion and all target areas with cohesive and non-cohesive sediments in this section of the river are removed. Upstream loading for this scenario is assumed to be 0.16 kg/day throughout the modeled period (1998 to 2068). Residual sediment concentration is assumed to be 0.25 mg/kg for the top 26 cm of sediment for cohesive sediment segments, and 0.5 mg/kg for the top 26 cm of sediment for non-cohesive sediment segments. Percent PCB mass removed is calculated using the point-averaged method described above (instead of polygonal-weighted average) for all three river sections.

Scenario R01S2 (REM-0/0/3). This scenario includes the same components as Scenario R01CW, except that the upstream loading assumes a load of 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005.

Scenario E02CW (REM-0/10/MNA). All sediments (the full river section corresponding to MPA greater than 0 g/m^2 Tri+ PCBs) in dredgeable areas are removed from River Section 1 to predetermined elevations. In River Section 2, an MPA target of greater than 10 g/m^2 Tri+ PCBs was selected as the minimum target area criterion, and all target areas with cohesive and non-cohesive sediments are removed. There is no sediment removal from River Section 3, only monitored natural attenuation. This scenario is also based on the assumption that because most of the PCB contamination is in the first two sections of the river, sediment removal in the lower section may not be necessary. The upstream loading and residual sediment concentration assumptions and percent PCB mass removal calculation method are the same as for Scenario R01CW.

Scenario R02S2 (REM-0/10/MNA). This scenario includes the same components as Scenario R02CW, except that the upstream loading assumes a load of 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005.

Scenario R03CW (REM-0/MNA/MNA). This scenario addresses active remediation only for sediments in the TI Pool. Only monitored natural attenuation is planned for River Sections 2 and 3. For this scenario, all sediments (the full river section corresponding to MPA greater than 0 g/m^2 Tri+ PCBs) in dredgeable areas are removed from River Section 1 to predetermined elevations. There is no sediment removal from River Sections 2 and 3. The upstream loading and residual sediment concentration assumptions and percent PCB mass removal calculation method are the same as for Scenario R01CW.

Scenario R03S2 (REM-0/MNA/MNA). This scenario includes the same components as Scenario R03CW, except that the upstream loading assumes a load of 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005.

Scenario R04CW (REM-3/10/10). For this scenario, target areas in River Section 1 with an MPA target of greater than 3 g/m^2 Tri+ PCBs sediments (cohesive and non-cohesive) are removed. For River Sections 2 and 3, an MPA target of greater than 10 g/m^2 Tri+ PCBs was selected as the minimum target area criterion, and all target areas with cohesive and non-cohesive sediments in River Sections 2 and 3 are removed. The upstream loading and residual sediment concentration assumptions and percent PCB mass removal calculation method are the same as for Scenario R01CW.

Scenario R04S2 (REM-3/10/10). This scenario includes the same components as Scenario R04CW, except that the upstream loading assumes a load of 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005.

Scenario R05CW (REM-3/MNA/MNA). This scenario addresses active remediation only for sediments in the TI Pool. Only monitored natural attenuation is planned for River Sections 2 and 3. For this scenario, target areas in River Section 1 with an MPA target of greater than 3 g/m^2 Tri+ PCBs sediments (cohesive and non-cohesive) are removed. There is no sediment removal from River Sections 2 and 3. The upstream loading and residual sediment concentration assumptions and percent PCB mass removal calculation method are the same as for Scenario R01CW.

Scenario R05S2 (REM-3/MNA/MNA). This scenario includes the same components as Scenario R05CW, except that the upstream loading assumes a load of 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005.

Scenario R06CW (REM-0/10/10). All sediments (the full river section corresponding to MPA greater than 0 g/m^2 Tri+ PCBs) in dredgeable areas are removed from River Section 1 to predetermined elevations. Below the TI Dam (in River Sections 2 and 3), an MPA target of greater than 10 g/m^2 Tri+ PCBs was selected as the minimum target area criterion, and all target areas with cohesive and non-cohesive sediments are removed.The upstream loading and residual sediment concentration assumptions and percent PCB mass removal calculation method are the same as for Scenario R01CW.

Scenario R06S2 (REM-0/10/10). This scenario includes the same components as Scenario R06CW, except that the upstream loading assumes a load of 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005.

Scenario R07CW (REM-10/MNA/MNA). This scenario addresses active remediation only for sediments in the TI Pool. Only monitored natural attenuation is planned for River Sections 2 and 3. For this scenario, target areas in River Section 1 with an MPA target of greater than 10 g/m^2 Tri+ PCBs sediments (cohesive and non-cohesive) are removed. There is no sediment removal from River Sections 2 and 3. The upstream loading and residual sediment concentration assumptions and percent PCB mass removal calculation method are the same as for Scenario R01CW.

Scenario R07S2 (REM-10/MNA/MNA). This scenario includes the same components as Scenario R07CW, except that the upstream loading assumes a load of 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005.

Scenario R08S2 (REM-0/0/3). This scenario is essentially the same as Scenario R01S2 and represents the most aggressive removal action for the Upper Hudson. All sediments (the full river section corresponding to MPA greater than 0 g/m^2 Tri+ PCBs) in dredgeable areas are removed from Rogers Island to Northumberland Dam to predetermined elevations. Below Northumberland Dam, an MPA target of greater than 3 g/m^2 Tri+ PCBs was selected as the minimum target area criterion and all target areas with cohesive and non-cohesive sediments in this section of the river are removed. The upstream loading and residual sediment concentration assumptions are also the same as for Scenario R01S2. The only difference between this scenario and Scenario R01S2 is that the percent PCB mass removed is calculated using the polygonal-weighted average method instead of point-averaged method for River Section 1. For River Sections 2 and 3, the point-averaged method is used to calculate percent PCB mass removed.

Scenario R09S2 (REM-3/10/10). This scenario is essentially the same as Scenario R04S2, except the percent PCB mass removed is calculated using the polygonal-weighted average method instead of point-averaged method for River Section 1. (For River Sections 2 and 3, the point-averaged method is used to calculate percent PCB mass removed.) For this scenario, target areas in River Section 1 with an MPA target of greater than 3 g/m^2 Tri+ PCBs sediments (cohesive and non-cohesive) are removed. For River Sections 2 and 3, an MPA target of greater than 10 g/m^2 Tri+ PCBs was selected as the minimum target area criterion, and all target areas with cohesive and non-cohesive sediments in River Sections 2 and 3 are removed. The upstream loading and residual sediment concentration assumptions are the same as for Scenario R01S2.

Scenario R10S2 (REM-10/MNA/MNA). This scenario is essentially the same as Scenario R07S2, except the percent PCB mass removed is calculated using the polygonal-weighted average method instead of point-averaged method for River Section 1. (For River Sections 2 and 3, the point-averaged method is used to calculate percent PCB mass removed.) This scenario addresses active remediation only for sediments in the TI Pool. Only monitored natural attenuation is planned for River Sections 2 and 3. For this scenario, target areas in River Section 1 with an MPA target of greater than 10 g/m^2 Tri+ PCBs sediments (cohesive and non-cohesive) are removed. There is no sediment removal from

River Sections 2 and 3. The upstream loading and residual sediment concentration assumptions are the same as for Scenario R01S2.

Scenario R11S2 (REM-3+C/10/36-37). For this scenario, target areas in River Section 1 with an MPA target of greater than 3 g/m^2 Tri+ PCBs sediments (cohesive and non-cohesive) are removed. In addition, sediments in the navigational channel not targeted for contaminant removal will be removed. For River Section 2, an MPA target of greater than 10 g/m^2 Tri+ PCBs was selected as the minimum target area criterion, and all target areas with cohesive and non-cohesive sediments in River Section 2 are removed. For River Section 3, NYSDEC-defined Hot Spots 36 and 37 are targeted for removal. The upstream loading and residual sediment concentration assumptions are the same as for Scenario R01S2. Percent PCB mass removed is calculated using the polygonal-weighted average method described above (instead of point-averaged) for River Section 1. For River Sections 2 and 3, the point-averaged method is used to calculate percent PCB mass removed.

Scenario R12S2 (REM-0/10/36-37). For this scenario, all sediments (the full river section corresponding to MPA greater than 0 g/m^2 Tri+ PCBs) in dredgeable areas are removed from Rogers Island to Northumberland Dam to predetermined elevations. For River Section 2, an MPA target of greater than 10 g/m^2 Tri+ PCBs was selected as the minimum target area criterion, and all target areas with cohesive and non-cohesive sediments in River Section 2 are removed. For River Section 3, NYSDEC-defined Hot Spots 36 and 37 are targeted for removal. The upstream loading and residual sediment concentration assumptions are the same as for Scenario R01S2. Percent PCB mass removed is calculated using the polygonal-weighted average method described above (instead of point-averaged) for River Section 1. For River Sections 2 and 3, the point-averaged method is used to calculate percent PCB mass removed.

Scenario R13S2 (REM-3/10/36-37). For this scenario, target areas in River Section 1 with an MPA target of greater than 3 g/m^2 Tri+ PCBs sediments (cohesive and non-cohesive) are removed. For River Section 2, an MPA target of greater than 10 g/m^2 Tri+ PCBs was selected as the minimum target area criterion, and all target areas with cohesive and non-cohesive sediments in River Section 2 are removed. For River Section 3, NYSDEC-defined Hot Spots 36 and 37 are targeted for removal. The upstream loading and residual sediment concentration assumptions are the same as for Scenario R01S2. Percent PCB mass removed is calculated using the polygonal-weighted average method described above (instead of point-averaged) for River Section 1. For River Sections 2 and 3, the point-averaged method is used to calculate percent PCB mass removed.

Scenario R14S2 (REM-3/10/Select). For this scenario, target areas in River Section 1 with an MPA target of greater than 3 g/m^2 Tri+ PCBs sediments (cohesive and non-cohesive) are removed. For River Section 2, an MPA target of greater than 10 g/m^2 Tri+ PCBs was selected as the minimum target area criterion, and all target areas with cohesive and non-cohesive sediments in River Section 2 are removed. For River Section 3, NYSDEC-defined Hot Spots 36, 37 and part of Hot Spot 39 are targeted for removal. This scenario also includes removal of navigational channel sediments as required to implement the remedy. The upstream loading and residual sediment concentration assumptions are the same as for Scenario R01S2. Percent PCB mass removed is calculated using the polygonal-weighted average method described above (instead of point-averaged) for River Section 1. For River Sections 2 and 3, the point-averaged method is used to calculate percent PCB mass removed.

Scenario R16S2 (REM-0/0/3). This scenario is essentially the same as Scenario R08S2 and represents the most aggressive removal action for the Upper Hudson. All sediments (the full river section corresponding to MPA greater than 0 g/m^2 Tri+ PCBs) in dredgeable areas are removed from Rogers Island to Northumberland Dam to predetermined elevations. Below Northumberland Dam, an MPA target of greater than 3 g/m^2 Tri+ PCBs was selected as the minimum target area criterion and all target areas with cohesive and non-cohesive sediments in this section of the river are removed. The difference between this scenario and Scenario R08S2 is that this scenario also includes removal of navigational channel sediments as required to implement the remedy. The upstream loading and residual sediment concentration assumptions and percent PCB removal are also the same as for Scenario R08S2.

Simulation of Containment with Select Removal

Four containment with select removal scenarios were evaluated using HUDTOX to forecast impact of these scenarios on the overall remediation of the Upper Hudson River over a 70-year period (1998 to 2068). All containment with select removal scenarios were simulated assuming upstream load of 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005.

Description of Engineering Level Modeling Containment with Select Removal Scenarios

A brief description of the refined engineering level containment with select removal scenarios that were modeled appears in the following text. The corresponding name of the potential remedial alternative is included in parentheses.

Scenario R15AS2 (CAP-3/10/Select). For this scenario, target areas in River Section 1 with an MPA target of greater than 3 g/m^2 Tri+ PCBs sediments (cohesive and non-cohesive) are removed and/or capped. For River Section 2, an MPA target of greater than 10 g/m^2 Tri+ PCBs was selected as the minimum target area criterion, and all target areas with cohesive and non-cohesive sediments in River Section 2 are removed and/or capped. For River Section 3, NYSDEC-defined Hot Spots 36, 37 and part of Hot Spot 39 are targeted for removal. This scenario also includes removal of navigational channel sediments as required to implement the remedy.

Target areas associated with water depths less than 6 feet are removed and/or capped. If contamination exists at sediment less than 2 feet, all contamination is removed and no capping is required. For deeper contamination, capping is implemented after removal. Target areas with water depths 6 to 12 feet are capped. Target areas associated with water depths greater than 12 feet are removed. The 12-foot water depth contour is assumed to represent the edge of the navigation channel. Capping is not conducted within the navigation channel, due to the necessity of routine maintenance dredging which would likely damage or destroy the cap. In portions of the river where the navigation channel is located within a land cut, target areas associated with water depths greater than 12 feet are capped.

For this scenario, it is assumed that a percentage (10%) of the area in the area targeted for capping is assumed to not have a cap (due to improper placement during construction of the cap or to subsequent damage to the cap after placement). Random areas were selected from the areas targeted for capping to represent the 10% missing portion.

Upstream loading for this scenario is assumed to be 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005. For this scenario, the vertical concentration profile for all capped areas was assumed to be 0 mg/kg for the entire sediment depth represented in the model (26 cm). The assumed vertical concentration profile for removal areas that are not subsequently capped with water depth greater than 12 feet (i.e., within the navigation channel) was 1 mg/kg for the top 10 cm of sediment and 0 mg/kg below. The assumed vertical concentration profile for removal areas that are not subsequently capped with water depth less than 12 feet was assumed to be 0.25 mg/kg for the entire sediment depth represented in the model (26 cm). Percent PCB mass removed is calculated using the polygonal-weighted average method described above (instead of point-averaged) for River Section 1. For River Sections 2 and 3, the point-averaged method is used to calculate percent PCB mass removed.

Scenario R17S2 (CAP-0/10/36-37). For this scenario, all sediments (the full river section corresponding to MPA greater than 0 g/m^2 Tri+ PCBs) are removed and/or capped in River Section 1. For River Section 2, an MPA target of greater than 10 g/m^2 Tri+ PCBs was selected as the minimum target area criterion, and all target areas with cohesive and non-cohesive sediments in River Section 2 are removed and/or capped. For River Section 3, NYSDEC-defined Hot Spots 36 and 37 are targeted for removal. The selection criteria for capping and removal of target areas (based on their associated water depths) in this scenario are the same as described above for Scenario R15S2. The percent area of improper cap placement, upstream loading, and method of calculating percent PCB mass removal are the same as for Scenario R15S2. Residual sediment concentration assumptions are the same as for Scenario R15AS2.

Scenario R18S2 (CAP-0/10/MNA). For this scenario, all sediments (the full river section corresponding to MPA greater than 0 g/m^2 Tri+ PCBs) are removed and/or capped in River Section 1. For River Section 2, an MPA target of greater than 10 g/m^2 Tri+ PCBs was selected as the minimum target area criterion, and all target areas with cohesive and non-cohesive sediments in River Section 2 are removed and/or capped. For River Section 3, only monitored natural attenuation is planned. The selection criteria for capping and removal of target areas (based on their associated water depths) in this scenario are the same as described above for Scenario R15S2. The percent area of improper cap placement, upstream loading, and method of calculating percent PCB mass removal are the same as for Scenario R15S2. Residual sediment concentration assumptions are the same as for Scenario R15AS2.

Scenario R19S2 (CAP-0/MNA/MNA). For this scenario, all sediments (the full river section corresponding to MPA greater than 0 g/m^2 Tri+ PCBs) are removed and/or capped in River Section 1. For River Sections 2 and 3, only monitored natural attenuation is planned. The selection criteria for capping and removal of target areas (based on their associated water depths) in this scenario are the same as described above for Scenario R14S2. The percent area of improper cap placement, upstream loading, and method of calculating percent PCB mass removal are the same as for Scenario R15S2. Residual sediment concentration assumptions are the same as for Scenario R15AS2.

MODEL SENSITIVITY ANALYSIS

The evaluation of removal and containment with select removal scenarios discussed above suggested additional simulations with some modifications and additions. Following the determination of the general effectiveness of the engineering scenarios in the two alternative categories (removal and containment with select removal) relative to No Action, sensitivity analysis is required to show the possible range of behavior due to assumptions of sensitive parameters. The parameters chosen for sensitivity analysis include the residual sediment concentration for removal action scenarios, and the potential partial failure of the containment or improper placement of the cap for the containment with select removal scenarios.

Model Sensitivity Testing for Removal Scenarios

The sensitivity of the model simulation of the removal scenarios was evaluated by varying the residual sediment surface concentration at the end of remediation. The purpose of this exercise was to evaluate the potential effects of incomplete removal actions (*i.e*., higher residual PCB concentrations in surface sediments) and "perfect" removal (*i.e.*, residual PCB concentration of zero) on the resulting concentrations of PCBs in fish and surface water quality in River Sections 1, 2, and 3 of the Upper Hudson River.

Three simulations for sensitivity analyses were conducted for the removal action scenarios. The sensitivity analyses were based on the input for Scenario R14S2 (REM-3/10/Select) with the following variations: three different residual Tri+ PCB concentrations, 0 mg/kg in the entire depth of sediment modeled in dredged areas (Scenario R14S2-0), 2 mg/kg in the top 10 cm of sediment in dredged areas (Scenario R14S2-2), and 5 mg/kg in the top 10 cm of sediment in dredged areas (Scenario R14S2-5), were assumed as model inputs in place of the original Scenario R14S2 residual concentration of 0.25

mg/kg PCBs for cohesive sediments and 0.5 mg/kg for non-cohesive sediments in the entire depth of sediments in dredged areas. The PCB concentrations in residual sediments were used in adjusting the "PCB mass remaining" calculations for each sediment segment (described above).

In locations where the sediment concentration prior to remediation is less than the assumed value of 1 mg/kg, 2 mg/kg, or 5 mg/kg, the value was left unchanged. All three removal scenarios were conducted with an upstream load condition of 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005. All three removal scenarios assumed that sediments targeted for remediation are removed to non-^{137}Cs-bearing depths of the deepest cores within a given target area.

Description of Removal Scenarios for Sensitivity Testing

Scenario R14S2-0 (REM-3/10/Select). This scenario includes the same components as Scenario R14S2 except that the residual PCB concentration is 0 mg/kg instead of the original R14S2 residual concentration of 0.25 mg/kg in cohesive sediments and 0.5 mg PCBs in non-cohesive sediments.

Scenario R14S2-2 (REM-3/10/Select). This scenario includes the same components as Scenario R14S2 except that the residual PCB concentration is 2 mg/kg in the top 10 cm of sediment in dredged areas instead of the original R14S2 residual concentration of 0.25 mg/kg in the entire depth cohesive sediments modeled and 0.5 mg PCBs in the entire depth of non-cohesive sediments modeled.

Scenario R14S2-5 (REM-3/10/Select). This scenario includes the same components as Scenario R14S2 except that the residual PCB concentration is 5 mg/kg in the top 10 cm of sediment in dredged areas instead of the original R14S2 residual concentration of 0.25 mg/kg in the entire depth cohesive sediments modeled and 0.5 mg PCBs in the entire depth of non-cohesive sediments modeled.

Model Sensitivity Testing for Containment with Select Removal Scenarios

The sensitivity of the model simulation of the containment with select removal scenarios was evaluated by varying the percent of the area that was capped during remediation and after completion of construction of the cap. It should be noted that the base case of the capping scenario (Scenario R15S2) assumes that 10% of the area targeted for capping is not capped due to improper cap placement. The purpose of this exercise was to evaluate the potential effect of the various degrees of failure of the containment or improper placement of the cap on the resulting concentrations of PCBs in fish and surface water quality in River Sections 1, 2, and 3 of the Upper Hudson River. After construction of the cap was completed it was assumed that a fixed percentage of the capped area would constantly be repaired during periodic maintenance and that an equal percentage of the capped area would undergo damage, as could conceivably occur from erosion, boat anchors, ice rafting, or other factors.

Two simulations for sensitivity analyses were conducted for the containment (capping) with select removal scenarios. The sensitivity analyses were based on the input for Scenario R15S2 (CAP-3/10/Select), modified by the assumption that a greater percentage of the area in the area targeted for containment (capping) is assumed to not have a cap (due to improper placement during construction of the cap or to subsequent damage to the cap after placement). The two simulations that were modeled were that 15 percent (Scenario R15S2-15), and 25 percent (Scenario R15S2-25) of the areas targeted for capping were not capped. Random areas were selected from the areas targeted for capping to represent the respective missing portions. These random areas of missing cap were selected by placing a 120-ft square grid over the Upper Hudson River and assigning a number to each square. Then a random number generator was used to identify the grid squares to be removed (*i.e.*, assumed to be not capped) to achieve the reduction in percent of capped area for each sensitivity test simulation. The mass of PCBs remaining (*i.e.*, not capped or removed) was calculated for each of the sensitivity analysis runs, as well as the percent of area remediated.

The containment with select removal sensitivity analysis scenarios were conducted with an upstream load condition of 0.16 kg/day from 1998 to 2004, reducing to a load of 0.0256 kg/day after January 1, 2005. All scenarios assumed that sediments targeted for remediation are removed to non-^{137}Cs-bearing depths of the deepest cores within a given target area.

Scenario R15S2-15 (CAP-3/10/Select). This scenario includes the same components as Scenario R15S2 except that the area targeted for capping which would not be capped due to improper cap placement is increased to 15 percent from 10 percent in the original Scenario R15S2.

Scenario R15S2-25 (CAP-3/10/Select). This scenario includes the same components as Scenario R15S2 except that the area targeted for capping which would not be capped due to improper cap placement is increased to 25 percent from 10 percent in the original Scenario R15S2.

R01CW and R01S2					
REM-0/0/3					
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	2.61%	1.89%	N	0.5
49	Aug-04	0.00%	0.00%	N	0.5
50	Aug-04	3.80%	2.77%	N	0.5
51	Aug-04	9.34%	3.30%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	0.00%	0.00%	N	0.5
54	Aug-04	0.00%	0.00%	N	0.5
55	Aug-04	0.00%	0.00%	N	0.5
56	Aug-04	0.56%	0.56%	C	0.25
57	Aug-05	22.72%	5.23%	N	0.5
58	Aug-05	1.65%	3.63%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	0.00%	0.00%	C	0.25
62	Aug-05	0.00%	0.00%	N	0.5
63	Aug-05	0.00%	0.00%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	0.00%	0.00%	N	0.5
66	Aug-05	2.04%	2.04%	C	0.25
67	Aug-05	1.38%	1.00%	N	0.5
68	Aug-05	7.54%	7.54%	C	0.25
69	Aug-05	0.41%	1.71%	N	0.5
70	Aug-06	0.00%	0.00%	C	0.25
71	Aug-06	0.00%	0.00%	N	0.5
72	Aug-06	1.60%	1.60%	C	0.25
73	Aug-06	3.27%	2.38%	N	0.5
74	Aug-06	7.64%	7.60%	N	0.5
75	Aug-06	82.05%	41.30%	C	0.25
76	Aug-06	36.65%	7.22%	N	0.5
77	Aug-06	0.00%	0.00%	N	0.5
78	Aug-06	6.35%	6.35%	C	0.25
79	Aug-06	14.03%	7.41%	N	0.5
80	Aug-06	1.59%	2.68%	C	0.25
81	Aug-06	0.00%	0.00%	C	0.25
82	Aug-06	0.00%	0.00%	N	0.5
83	Aug-06	62.52%	10.92%	N	0.5
84	Aug-06	1.92%	8.71%	C	0.25
85	Aug-06	24.59%	19.01%	N	0.5
86	Aug-06	0.00%	0.00%	N	0.5
87	Aug-07	0.81%	0.59%	N	0.5
88	Aug-07	0.00%	0.00%	C	0.25
89	Aug-07	3.25%	2.36%	N	0.5
90	Aug-07	10.40%	11.59%	C	0.25
91	Aug-07	7.05%	5.18%	N	0.5
92	Aug-08	3.21%	5.10%	C	0.25
93	Aug-08	8.59%	6.34%	N	0.5
94	Aug-09	2.01%	2.01%	C	0.25
95	Aug-09	0.15%	5.73%	N	0.5
96	Aug-09	98.19%	97.51%	N	0.5
97	No change				
98	No change				
99	No change				
100	No change				
101	No change				
102	Aug-09	86.58%	90.25%	C	0.25
103	Aug-09	90.07%	97.57%	N	0.5
104	Aug-09	85.30%	97.21%	C	0.25
105	Aug-10	99.17%	99.66%	N	0.5
106	Aug-10	31.16%	32.77%	C	0.25
107	Aug-10	86.25%	96.81%	N	0.5
108	No change				
109	No change				
110	No change				
111	No change				
112	Aug-10	21.28%	67.58%	C	0.25
113	Aug-10	12.15%	74.36%	N	0.5
114	No change				
115	No change				
116	Aug-10	23.62%	72.86%	C	0.25
117	Aug-10	32.01%	68.82%	N	0.5
118	No change				
119	No change				
120	No change				
121	No change				
122	No change				
123	No change				

R02CW and R02S2					
REM-0/10/MNA					
SedSeg#	Year to Remediate	% PCB Mass Remains to LTI	% sedseg area not remediated	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	2.61%	1.89%	N	0.5
49	Aug-04	0.00%	0.00%	N	0.5
50	Aug-04	3.80%	2.77%	N	0.5
51	Aug-04	9.34%	3.30%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	0.00%	0.00%	N	0.5
54	Aug-04	0.00%	0.00%	N	0.5
55	Aug-05	0.00%	0.00%	N	0.5
56	Aug-05	0.56%	0.56%	C	0.25
57	Aug-05	22.72%	5.23%	N	0.5
58	Aug-05	1.65%	3.63%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	0.00%	0.00%	C	0.25
62	Aug-05	0.00%	0.00%	N	0.5
63	Aug-05	0.00%	0.00%	N	0.5
64	Aug-06	0.00%	0.00%	C	0.25
65	Aug-06	0.00%	0.00%	N	0.5
66	Aug-06	2.04%	2.04%	C	0.25
67	Aug-06	1.38%	1.00%	N	0.5
68	Aug-06	7.54%	7.54%	C	0.25
69	Aug-06	0.41%	1.71%	N	0.5
70	Aug-06	0.00%	0.00%	C	0.25
71	Aug-06	0.00%	0.00%	N	0.5
72	Aug-06	1.60%	1.60%	C	0.25
73	Aug-06	3.27%	2.38%	N	0.5
74	Aug-06	7.64%	7.60%	N	0.5
75	Aug-06	82.05%	41.30%	C	0.25
76	Aug-06	9.76%	7.22%	N	0.5
77	Aug-07	0.00%	0.00%	N	0.5
78	Aug-07	6.35%	6.35%	C	0.25
79	Aug-07	14.03%	7.41%	N	0.5
80	Aug-07	2.68%	2.68%	C	0.25
81	Aug-07	0.00%	0.00%	C	0.25
82	Aug-07	0.00%	0.00%	N	0.5
83	Aug-07	62.52%	10.92%	N	0.5
84	Aug-07	1.92%	8.71%	C	0.25
85	Aug-07	24.59%	19.01%	N	0.5
86	Aug-07	0.00%	0.00%	N	0.5
87	Aug-07	0.81%	0.59%	N	0.5
88	Aug-08	0.00%	0.00%	C	0.25
89	Aug-08	3.25%	2.36%	N	0.5
90	Aug-08	32.92%	52.64%	C	0.25
91	Aug-08	99.76%	99.62%	N	0.5
92	Aug-08	3.30%	49.53%	C	0.25
93	Aug-08	99.73%	99.57%	N	0.5
94	Aug-08	14.59%	57.42%	C	0.25
95	Aug-08	81.64%	92.87%	N	0.5
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	No Change	No Change	No Change	No Change	No Change
113	No Change	No Change	No Change	No Change	No Change
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

R03CW and R03S2					
REM-0/MNA/MNA					
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	2.61%	1.89%	N	0.5
49	Aug-04	0.00%	0.00%	N	0.5
50	Aug-04	3.80%	2.77%	N	0.5
51	Aug-04	9.34%	3.30%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	0.00%	0.00%	N	0.5
54	Aug-04	0.00%	0.00%	N	0.5
55	Aug-04	0.00%	0.00%	N	0.5
56	Aug-04	0.56%	0.56%	C	0.25
57	Aug-05	22.72%	5.23%	N	0.5
58	Aug-05	1.65%	3.63%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	0.00%	0.00%	C	0.25
62	Aug-05	0.00%	0.00%	N	0.5
63	Aug-05	0.00%	0.00%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	0.00%	0.00%	N	0.5
66	Aug-05	2.04%	2.04%	C	0.25
67	Aug-05	1.38%	1.00%	N	0.5
68	Aug-05	7.54%	7.54%	C	0.25
69	Aug-05	0.41%	1.71%	N	0.5
70	Aug-06	0.00%	0.00%	C	0.25
71	Aug-06	0.00%	0.00%	N	0.5
72	Aug-06	1.60%	1.60%	C	0.25
73	Aug-06	3.27%	2.38%	N	0.5
74	Aug-06	7.64%	7.60%	N	0.5
75	Aug-06	82.05%	41.30%	C	0.25
76	Aug-06	36.65%	7.22%	N	0.5
77	Aug-06	0.00%	0.00%	N	0.5
78	Aug-06	6.35%	6.35%	C	0.25
79	Aug-06	14.03%	7.41%	N	0.5
80	Aug-06	1.59%	2.68%	C	0.25
81	Aug-06	0.00%	0.00%	C	0.25
82	Aug-06	0.00%	0.00%	N	0.5
83	Aug-06	62.52%	10.92%	N	0.5
84	Aug-06	1.92%	8.71%	C	0.25
85	Aug-06	24.59%	19.01%	N	0.5
86	Aug-06	0.00%	0.00%	N	0.5
87	Aug-07	0.81%	0.59%	N	0.5
88	Aug-07	0.00%	0.00%	C	0.25
89	Aug-07	3.25%	2.36%	N	0.5
90			No change		
91			No change		
92			No change		
93			No change		
94			No change		
95			No change		
96			No change		
97			No change		
98			No change		
99			No change		
100			No change		
101			No change		
102			No change		
103			No change		
104			No change		
105			No change		
106			No change		
107			No change		
108			No change		
109			No change		
110			No change		
111			No change		
112			No change		
113			No change		
114			No change		
115			No change		
116			No change		
117			No change		
118			No change		
119			No change		
120			No change		
121			No change		
122			No change		
123			No change		

R04CW and R04S2					
REM-3/10/10					
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	98.12%	88.60%	N	0.5
49	Aug-04	100.00%	100.00%	N	0.5
50	Aug-04	87.19%	73.83%	N	0.5
51	Aug-04	1.90%	23.74%	N	0.5
52	Aug-04	2.82%	20.12%	C	0.25
53	Aug-04	53.91%	54.80%	N	0.5
54	Aug-04	69.63%	60.89%	N	0.5
55	Aug-04	95.29%	93.51%	N	0.5
56	Aug-04	0.60%	0.60%	C	0.25
57	Aug-04	22.66%	5.33%	N	0.5
58	Aug-04	1.65%	3.64%	N	0.5
59	Aug-04	0.00%	0.00%	C	0.25
60	Aug-04	0.00%	0.00%	N	0.5
61	Aug-05	2.57%	15.22%	C	0.25
62	Aug-05	62.53%	71.16%	N	0.5
63	Aug-05	36.96%	41.45%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	0.00%	0.00%	N	0.5
66	Aug-05	36.79%	60.34%	C	0.25
67	Aug-05	47.92%	74.63%	N	0.5
68	Aug-05	15.94%	55.70%	C	0.25
69	Aug-05	63.12%	71.95%	N	0.5
70	Aug-05	0.00%	0.00%	C	0.25
71	Aug-05	0.00%	0.00%	N	0.5
72	Aug-05	6.03%	14.61%	C	0.25
73	Aug-05	6.56%	18.69%	N	0.5
74	Aug-05	45.86%	48.88%	N	0.5
75	Aug-05	63.78%	57.52%	C	0.25
76	Aug-05	17.59%	23.46%	N	0.5
77	Aug-05	21.03%	57.62%	N	0.5
78	Aug-06	7.09%	7.09%	C	0.25
79	Aug-06	66.15%	60.67%	N	0.5
80	Aug-06	5.07%	5.06%	C	0.25
81	Aug-06	3.94%	34.48%	C	0.25
82	Aug-06	93.25%	69.75%	N	0.5
83	Aug-06	94.68%	69.64%	N	0.5
84	Aug-06	1.89%	10.39%	C	0.25
85	Aug-06	37.23%	29.93%	N	0.5
86	Aug-06	25.59%	55.59%	N	0.5
87	Aug-06	55.79%	75.98%	N	0.5
88	Aug-06	9.11%	32.26%	C	0.25
89	Aug-06	50.24%	73.92%	N	0.5
90	Aug-06	32.92%	52.64%	C	0.25
91	Aug-06	99.76%	99.62%	N	0.5
92	Aug-06	3.30%	49.53%	C	0.25
93	Aug-07	99.73%	99.57%	N	0.5
94	Aug-07	14.59%	57.42%	C	0.25
95	Aug-07	81.64%	92.87%	N	0.5
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	Aug-07	51.80%	67.58%	C	0.25
113	Aug-07	18.49%	74.35%	N	0.5
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	Aug-07	23.16%	72.34%	C	0.25
117	Aug-07	60.37%	90.20%	N	0.5
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

R05CW and R05S2					
REM-3/MNA/MNA					
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	98.12%	88.60%	N	0.5
49	Aug-04	100.00%	100.00%	N	0.5
50	Aug-04	87.19%	73.83%	N	0.5
51	Aug-04	1.90%	23.74%	N	0.5
52	Aug-04	2.82%	20.12%	C	0.25
53	Aug-04	53.91%	54.80%	N	0.5
54	Aug-04	69.63%	60.89%	N	0.5
55	Aug-04	95.29%	93.51%	N	0.5
56	Aug-04	0.60%	0.60%	C	0.25
57	Aug-04	22.66%	5.33%	N	0.5
58	Aug-04	1.65%	3.64%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	2.57%	15.22%	C	0.25
62	Aug-05	62.53%	71.16%	N	0.5
63	Aug-05	36.96%	41.45%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	0.00%	0.00%	N	0.5
66	Aug-05	36.79%	60.34%	C	0.25
67	Aug-05	47.92%	74.63%	N	0.5
68	Aug-05	15.94%	55.70%	C	0.25
69	Aug-05	63.12%	71.95%	N	0.5
70	Aug-05	0.00%	0.00%	C	0.25
71	Aug-05	0.00%	0.00%	N	0.5
72	Aug-05	6.03%	14.61%	C	0.25
73	Aug-05	6.56%	18.69%	N	0.5
74	Aug-06	45.86%	48.88%	N	0.5
75	Aug-06	63.78%	57.52%	C	0.25
76	Aug-06	17.59%	23.46%	N	0.5
77	Aug-06	21.03%	57.62%	N	0.5
78	Aug-06	7.09%	7.09%	C	0.25
79	Aug-06	66.15%	60.67%	N	0.5
80	Aug-06	5.07%	5.06%	C	0.25
81	Aug-06	3.94%	34.48%	C	0.25
82	Aug-06	93.25%	69.75%	N	0.5
83	Aug-06	94.68%	69.64%	N	0.5
84	Aug-06	1.89%	10.39%	C	0.25
85	Aug-06	37.23%	29.93%	N	0.5
86	Aug-06	25.59%	55.59%	N	0.5
87	Aug-06	55.79%	75.98%	N	0.5
88	Aug-06	9.11%	32.26%	C	0.25
89	Aug-06	50.24%	73.92%	N	0.5
90	No Change	No Change	No Change	No Change	No Change
91	No Change	No Change	No Change	No Change	No Change
92	No Change	No Change	No Change	No Change	No Change
93	No Change	No Change	No Change	No Change	No Change
94	No Change	No Change	No Change	No Change	No Change
95	No Change	No Change	No Change	No Change	No Change
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	No Change	No Change	No Change	No Change	No Change
113	No Change	No Change	No Change	No Change	No Change
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	2.61%	1.89%	N	0.5
49	Aug-04	0.00%	0.00%	N	0.5
50	Aug-04	3.80%	2.77%	N	0.5
51	Aug-04	9.34%	3.30%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	0.00%	0.00%	N	0.5
54	Aug-04	0.00%	0.00%	N	0.5
55	Aug-04	0.00%	0.00%	N	0.5
56	Aug-05	0.56%	0.56%	C	0.25
57	Aug-05	22.72%	5.23%	N	0.5
58	Aug-05	1.65%	3.63%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	0.00%	0.00%	C	0.25
62	Aug-05	0.00%	0.00%	N	0.5
63	Aug-05	0.00%	0.00%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	0.00%	0.00%	N	0.5
66	Aug-06	2.04%	2.04%	C	0.25
67	Aug-06	1.38%	1.00%	N	0.5
68	Aug-06	7.54%	7.54%	C	0.25
69	Aug-06	0.41%	1.71%	N	0.5
70	Aug-06	0.00%	0.00%	C	0.25
71	Aug-06	0.00%	0.00%	N	0.5
72	Aug-06	1.60%	1.60%	C	0.25
73	Aug-06	3.27%	2.38%	N	0.5
74	Aug-06	7.64%	7.60%	N	0.5
75	Aug-06	82.05%	41.30%	C	0.25
76	Aug-06	9.76%	7.22%	N	0.5
77	Aug-06	0.00%	0.00%	N	0.5
78	Aug-06	6.35%	6.35%	C	0.25
79	Aug-06	14.03%	7.41%	N	0.5
80	Aug-07	1.59%	2.68%	C	0.25
81	Aug-07	0.00%	0.00%	C	0.25
82	Aug-07	0.00%	0.00%	N	0.5
83	Aug-07	62.52%	10.92%	N	0.5
84	Aug-07	1.92%	8.71%	C	0.25
85	Aug-07	24.59%	19.01%	N	0.5
86	Aug-07	0.00%	0.00%	N	0.5
87	Aug-07	0.81%	0.59%	N	0.5
88	Aug-07	0.00%	0.00%	C	0.25
89	Aug-07	3.25%	2.36%	N	0.5
90	Aug-08	32.92%	52.64%	C	0.25
91	Aug-08	99.76%	99.62%	N	0.5
92	Aug-08	3.30%	49.53%	C	0.25
93	Aug-08	99.73%	99.57%	N	0.5
94	Aug-08	14.59%	57.42%	C	0.25
95	Aug-08	81.64%	92.87%	N	0.5
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	Aug-08	51.80%	67.58%	C	0.25
113	Aug-08	18.49%	74.35%	N	0.5
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	Aug-08	23.16%	72.34%	C	0.25
117	Aug-08	60.37%	90.20%	N	0.5
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

R07CW and R07S2
REM-10/MNA/MNA

SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	No Change	No Change	No Change	No Change	No Change
49	No Change	No Change	No Change	No Change	No Change
50	Aug-04	95.97%	79.67%	N	0.5
51	No Change	No Change	No Change	No Change	No Change
52	Aug-04	2.81%	20.02%	C	0.25
53	Aug-04	64.05%	54.76%	N	0.5
54	Aug-04	88.06%	86.89%	N	0.5
55	No Change	No Change	No Change	No Change	No Change
56	Aug-04	0.53%	2.78%	C	0.25
57	Aug-04	65.77%	69.37%	N	0.5
58	Aug-04	91.86%	89.42%	N	0.5
59	Aug-04	4.07%	7.77%	C	0.25
60	Aug-04	5.01%	17.24%	N	0.5
61	Aug-04	5.73%	24.88%	C	0.25
62	Aug-04	73.84%	76.60%	N	0.5
63	Aug-04	94.53%	93.55%	N	0.5
64	Aug-04	0.00%	0.00%	C	0.25
65	Aug-04	17.07%	27.62%	N	0.5
66	Aug-04	46.62%	75.24%	C	0.25
67	Aug-04	55.80%	79.20%	N	0.5
68	Aug-05	17.86%	57.71%	C	0.25
69	Aug-05	74.17%	91.36%	N	0.5
70	Aug-05	0.00%	0.00%	C	0.25
71	Aug-05	38.45%	15.49%	N	0.5
72	Aug-05	6.82%	31.85%	C	0.25
73	Aug-05	64.03%	72.39%	N	0.5
74	Aug-05	90.22%	88.22%	N	0.5
75	Aug-05	96.23%	96.60%	C	0.25
76	No Change	No Change	No Change	No Change	No Change
77	No Change	No Change	No Change	No Change	No Change
78	Aug-05	7.65%	7.65%	C	0.25
79	Aug-05	99.63%	99.40%	N	0.5
80	Aug-05	15.47%	9.90%	C	0.25
81	Aug-05	17.18%	72.70%	C	0.25
82	Aug-05	96.75%	94.87%	N	0.5
83	Aug-05	99.30%	95.52%	N	0.5
84	Aug-05	4.24%	11.86%	C	0.25
85	No Change	No Change	No Change	No Change	No Change
86	Aug-05	66.36%	87.99%	N	0.5
87	Aug-05	83.02%	93.70%	N	0.5
88	Aug-05	17.54%	48.41%	C	0.25
89	Aug-05	63.81%	81.00%	N	0.5
90	No Change	No Change	No Change	No Change	No Change
91	No Change	No Change	No Change	No Change	No Change
92	No Change	No Change	No Change	No Change	No Change
93	No Change	No Change	No Change	No Change	No Change
94	No Change	No Change	No Change	No Change	No Change
95	No Change	No Change	No Change	No Change	No Change
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	No Change	No Change	No Change	No Change	No Change
113	No Change	No Change	No Change	No Change	No Change
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

R08S2					
REM-0/0/3					
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	29.85%	10.63%	N	0.5
49	Aug-04	12.32%	5.04%	N	0.5
50	Aug-04	0.31%	0.43%	N	0.5
51	Aug-04	0.19%	0.12%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	0.00%	0.00%	N	0.5
54	Aug-04	0.00%	0.00%	N	0.5
55	Aug-04	0.00%	0.00%	N	0.5
56	Aug-04	0.33%	0.56%	C	0.25
57	Aug-05	7.88%	5.22%	N	0.5
58	Aug-05	5.25%	3.63%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	0.00%	0.00%	C	0.25
62	Aug-05	0.08%	0.03%	N	0.5
63	Aug-05	0.00%	0.00%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	0.00%	0.00%	N	0.5
66	Aug-05	1.04%	2.04%	C	0.25
67	Aug-05	0.56%	1.00%	N	0.5
68	Aug-05	1.96%	7.54%	C	0.25
69	Aug-05	2.31%	1.71%	N	0.5
70	Aug-06	0.00%	0.00%	C	0.25
71	Aug-06	0.00%	0.00%	N	0.5
72	Aug-06	0.22%	1.60%	C	0.25
73	Aug-06	3.83%	2.38%	N	0.5
74	Aug-06	8.94%	7.60%	N	0.5
75	Aug-06	48.41%	41.30%	C	0.25
76	Aug-06	3.32%	7.22%	N	0.5
77	Aug-06	0.11%	0.09%	N	0.5
78	Aug-06	6.37%	6.35%	C	0.25
79	Aug-06	15.26%	7.41%	N	0.5
80	Aug-06	1.27%	2.68%	C	0.25
81	Aug-06	0.00%	0.00%	C	0.25
82	Aug-06	0.00%	0.00%	N	0.5
83	Aug-06	21.26%	11.38%	N	0.5
84	Aug-06	5.72%	8.71%	C	0.25
85	Aug-06	35.50%	20.19%	N	0.5
86	Aug-06	0.00%	0.00%	N	0.5
87	Aug-07	0.32%	0.59%	N	0.5
88	Aug-07	0.00%	0.00%	C	0.25
89	Aug-07	2.01%	2.36%	N	0.5
90	Aug-07	10.40%	11.59%	C	0.25
91	Aug-07	7.05%	5.18%	N	0.5
92	Aug-08	3.21%	5.10%	C	0.25
93	Aug-08	8.59%	6.34%	N	0.5
94	Aug-09	2.01%	2.01%	C	0.25
95	Aug-09	0.15%	5.73%	N	0.5
96	Aug-09	98.19%	97.51%	N	0.5
97			No change		
98			No change		
99			No change		
100			No change		
101			No change		
102	Aug-09	86.58%	90.25%	C	0.25
103	Aug-09	90.07%	97.57%	N	0.5
104	Aug-09	85.30%	97.21%	C	0.25
105	Aug-10	99.17%	99.66%	N	0.5
106	Aug-10	31.16%	32.77%	C	0.25
107	Aug-10	86.25%	96.81%	N	0.5
108			No change		
109			No change		
110			No change		
111			No change		
112	Aug-10	21.28%	67.58%	C	0.25
113	Aug-10	12.15%	74.36%	N	0.5
114			No change		
115			No change		
116	Aug-10	23.62%	72.86%	C	0.25
117	Aug-10	32.01%	68.82%	N	0.5
118			No change		
119			No change		
120			No change		
121			No change		
122			No change		
123			No change		

R09S2					
REM-3/10/10					
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	85.16%	88.60%	N	0.5
49	Aug-04	100.00%	100.00%	N	0.5
50	Aug-04	94.75%	93.78%	N	0.5
51	Aug-04	11.55%	25.54%	N	0.5
52	Aug-04	9.52%	20.12%	C	0.25
53	Aug-04	29.84%	36.16%	N	0.5
54	Aug-04	52.23%	57.76%	N	0.5
55	Aug-04	90.31%	93.51%	N	0.5
56	Aug-04	0.34%	0.60%	C	0.25
57	Aug-04	8.08%	5.33%	N	0.5
58	Aug-04	5.32%	3.67%	N	0.5
59	Aug-04	0.00%	0.00%	C	0.25
60	Aug-04	0.90%	0.69%	N	0.5
61	Aug-05	0.89%	15.22%	C	0.25
62	Aug-05	42.15%	59.96%	N	0.5
63	Aug-05	31.85%	41.32%	N	0.5
64	Aug-05	0.23%	0.39%	C	0.25
65	Aug-05	0.80%	0.24%	N	0.5
66	Aug-05	28.28%	60.34%	C	0.25
67	Aug-05	91.40%	74.63%	N	0.5
68	Aug-05	25.23%	55.70%	C	0.25
69	Aug-05	77.13%	72.16%	N	0.5
70	Aug-05	0.02%	0.01%	C	0.25
71	Aug-05	0.75%	0.43%	N	0.5
72	Aug-05	1.08%	15.15%	C	0.25
73	Aug-05	25.06%	18.70%	N	0.5
74	Aug-05	40.54%	48.76%	N	0.5
75	Aug-05	64.91%	57.52%	C	0.25
76	Aug-05	14.59%	23.25%	N	0.5
77	Aug-05	44.58%	57.62%	N	0.5
78	Aug-06	7.36%	7.09%	C	0.25
79	Aug-06	71.36%	60.67%	N	0.5
80	Aug-06	1.64%	5.06%	C	0.25
81	Aug-06	5.15%	34.48%	C	0.25
82	Aug-06	81.81%	69.75%	N	0.5
83	Aug-06	80.73%	69.64%	N	0.5
84	Aug-06	6.85%	10.39%	C	0.25
85	Aug-06	46.23%	29.93%	N	0.5
86	Aug-06	23.23%	55.96%	N	0.5
87	Aug-06	51.64%	75.78%	N	0.5
88	Aug-06	5.39%	32.26%	C	0.25
89	Aug-06	53.13%	73.73%	N	0.5
90	Aug-06	32.92%	52.64%	C	0.25
91	Aug-06	99.76%	99.62%	N	0.5
92	Aug-06	3.30%	49.53%	C	0.25
93	Aug-07	99.73%	99.57%	N	0.5
94	Aug-07	14.59%	57.42%	C	0.25
95	Aug-07	81.64%	92.87%	N	0.5
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	Aug-07	51.80%	67.58%	C	0.25
113	Aug-07	18.49%	74.35%	N	0.5
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	Aug-07	23.16%	72.34%	C	0.25
117	Aug-07	60.37%	90.20%	N	0.5
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

R10S2					
REM-10/MNA/MNA					
SedSeg#	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	No Change	No Change	No Change	No Change	No Change
49	No Change	No Change	No Change	No Change	No Change
50	Aug-04	99.87%	99.62%	N	0.5
51	No Change	No Change	No Change	No Change	No Change
52	Aug-04	10.49%	20.02%	C	0.25
53	Aug-04	33.02%	36.12%	N	0.5
54	Aug-04	83.83%	83.77%	N	0.5
55	No Change	No Change	No Change	No Change	No Change
56	Aug-04	4.04%	2.78%	C	0.25
57	Aug-04	70.44%	69.37%	N	0.5
58	Aug-04	86.17%	89.42%	N	0.5
59	Aug-04	13.71%	7.77%	C	0.25
60	Aug-04	9.48%	17.24%	N	0.5
61	Aug-04	3.04%	24.88%	C	0.25
62	Aug-04	69.19%	76.60%	N	0.5
63	Aug-04	94.89%	93.55%	N	0.5
64	Aug-04	0.68%	0.97%	C	0.25
65	Aug-04	25.28%	27.62%	N	0.5
66	Aug-04	32.33%	75.24%	C	0.25
67	Aug-04	93.91%	79.20%	N	0.5
68	Aug-05	25.32%	55.83%	C	0.25
69	Aug-05	86.27%	91.89%	N	0.5
70	Aug-05	0.27%	0.23%	C	0.25
71	Aug-05	11.01%	15.49%	N	0.5
72	Aug-05	5.11%	31.85%	C	0.25
73	Aug-05	92.64%	72.39%	N	0.5
74	Aug-05	90.51%	88.22%	N	0.5
75	Aug-05	89.44%	96.60%	C	0.25
76	No Change	No Change	No Change	No Change	No Change
77	No Change	No Change	No Change	No Change	No Change
78	Aug-05	7.44%	7.20%	C	0.25
79	Aug-05	99.75%	99.40%	N	0.5
80	Aug-05	3.47%	9.91%	C	0.25
81	Aug-05	40.29%	72.88%	C	0.25
82	Aug-05	97.45%	95.04%	N	0.5
83	Aug-05	98.24%	95.40%	N	0.5
84	Aug-05	6.86%	10.30%	C	0.25
85	No Change	No Change	No Change	No Change	No Change
86	Aug-05	58.11%	88.53%	N	0.5
87	Aug-05	80.56%	92.66%	N	0.5
88	Aug-05	21.61%	48.45%	C	0.25
89	Aug-05	79.35%	80.30%	N	0.5
90	No Change	No Change	No Change	No Change	No Change
91	No Change	No Change	No Change	No Change	No Change
92	No Change	No Change	No Change	No Change	No Change
93	No Change	No Change	No Change	No Change	No Change
94	No Change	No Change	No Change	No Change	No Change
95	No Change	No Change	No Change	No Change	No Change
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	No Change	No Change	No Change	No Change	No Change
107	No Change	No Change	No Change	No Change	No Change
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	No Change	No Change	No Change	No Change	No Change
113	No Change	No Change	No Change	No Change	No Change
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

R11S2
REM-3/10/hot spots 36, 37 & part of 39, plus channel to implement remediation

SedSeg#	Year to Remediate	% PCB Mass Remains to LTI	% sedseg area not remediated	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	85.16%	88.60%	N	0.5
49	Aug-04	91.00%	64.28%	N	0.5
50	Aug-04	93.96%	93.40%	N	0.5
51	Aug-04	1.66%	0.38%	N	0.5
52	Aug-04	9.52%	20.12%	C	0.25
53	Aug-04	29.84%	36.16%	N	0.5
54	Aug-04	19.15%	15.75%	N	0.5
55	Aug-04	46.56%	45.70%	N	0.5
56	Aug-04	0.34%	0.60%	C	0.25
57	Aug-04	8.08%	5.33%	N	0.5
58	Aug-04	5.32%	3.67%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.90%	0.69%	N	0.5
61	Aug-05	0.84%	15.17%	C	0.25
62	Aug-05	30.87%	36.10%	N	0.5
63	Aug-05	12.33%	13.05%	N	0.5
64	Aug-05	0.23%	0.39%	C	0.25
65	Aug-05	0.80%	0.24%	N	0.5
66	Aug-05	27.60%	57.23%	C	0.25
67	Aug-05	71.00%	42.34%	N	0.5
68	Aug-05	4.22%	16.09%	C	0.25
69	Aug-05	7.80%	6.30%	N	0.5
70	Aug-05	0.02%	0.01%	C	0.25
71	Aug-06	0.01%	0.04%	N	0.5
72	Aug-06	1.08%	14.99%	C	0.25
73	Aug-06	19.64%	14.94%	N	0.5
74	Aug-06	14.85%	12.19%	N	0.5
75	Aug-06	64.89%	57.50%	C	0.25
76	Aug-06	14.40%	22.53%	N	0.5
77	Aug-06	34.56%	36.21%	N	0.5
78	Aug-06	6.18%	6.14%	C	0.25
79	Aug-06	21.81%	13.95%	N	0.5
80	Aug-06	1.64%	5.06%	C	0.25
81	Aug-06	4.21%	27.88%	C	0.25
82	Aug-06	31.41%	39.42%	N	0.5
83	Aug-06	31.38%	22.79%	N	0.5
84	Aug-07	6.10%	9.03%	C	0.25
85	Aug-07	35.44%	20.16%	N	0.5
86	Aug-07	23.13%	55.77%	N	0.5
87	Aug-07	29.52%	58.79%	N	0.5
88	Aug-07	5.39%	32.26%	C	0.25
89	Aug-07	46.36%	72.64%	N	0.5
90	Aug-07	32.92%	52.64%	C	0.25
91	Aug-07	99.76%	99.62%	N	0.5
92	Aug-07	3.50%	49.53%	C	0.25
93	Aug-07	99.73%	99.57%	N	0.5
94	Aug-07	15.06%	57.42%	C	0.25
95	Aug-07	81.64%	92.87%	N	0.5
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	Aug-08	31.16%	32.77%	C	0.25
107	Aug-08	86.25%	96.81%	N	0.5
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	Aug-08	21.28%	67.58%	C	0.25
113	Aug-08	12.15%	74.36%	N	0.5
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

R12S2
REM-0/10/hot spots 36 & 37

SedSeg#	Year to Remediate	% PCB Mass Remains to LTI	% sedseg area not remediated	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	29.85%	10.63%	N	0.5
49	Aug-04	12.32%	5.04%	N	0.5
50	Aug-04	0.31%	0.43%	N	0.5
51	Aug-04	0.19%	0.12%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	0.00%	0.00%	N	0.5
54	Aug-04	0.00%	0.00%	N	0.5
55	Aug-05	0.00%	0.00%	N	0.5
56	Aug-05	0.33%	0.56%	C	0.25
57	Aug-05	7.88%	5.22%	N	0.5
58	Aug-05	5.25%	3.63%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	0.00%	0.00%	C	0.25
62	Aug-05	0.08%	0.03%	N	0.5
63	Aug-05	0.00%	0.00%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-06	0.00%	0.00%	N	0.5
66	Aug-06	1.04%	2.04%	C	0.25
67	Aug-06	0.56%	1.00%	N	0.5
68	Aug-06	1.96%	7.54%	C	0.25
69	Aug-06	2.31%	1.71%	N	0.5
70	Aug-06	0.00%	0.00%	C	0.25
71	Aug-06	0.00%	0.00%	N	0.5
72	Aug-06	0.22%	1.60%	C	0.25
73	Aug-06	3.83%	2.38%	N	0.5
74	Aug-06	8.94%	7.60%	N	0.5
75	Aug-07	48.41%	41.30%	C	0.25
76	Aug-07	3.32%	7.22%	N	0.5
77	Aug-07	0.11%	0.09%	N	0.5
78	Aug-07	6.37%	6.35%	C	0.25
79	Aug-07	15.26%	7.41%	N	0.5
80	Aug-07	1.27%	2.68%	C	0.25
81	Aug-07	0.00%	0.00%	C	0.25
82	Aug-07	0.00%	0.00%	N	0.5
83	Aug-07	21.26%	11.38%	N	0.5
84	Aug-07	5.72%	8.71%	C	0.25
85	Aug-07	35.50%	20.19%	N	0.5
86	Aug-07	0.00%	0.00%	N	0.5
87	Aug-08	0.32%	0.59%	N	0.5
88	Aug-08	0.00%	0.00%	C	0.25
89	Aug-08	2.01%	2.36%	N	0.5
90	Aug-08	32.92%	52.64%	C	0.25
91	Aug-08	99.76%	99.62%	N	0.5
92	Aug-08	3.50%	49.53%	C	0.25
93	Aug-08	99.73%	99.57%	N	0.5
94	Aug-08	15.06%	57.42%	C	0.25
95	Aug-08	81.64%	92.87%	N	0.5
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	Aug-09	31.16%	32.77%	C	0.25
107	Aug-09	86.25%	96.81%	N	0.5
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	Aug-09	21.28%	67.58%	C	0.25
113	Aug-09	12.15%	74.36%	N	0.5
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

R13S2
REM-0/10/hot spots 36 & 37

SedSeg#	Year to Remediate	% PCB Mass Remains to LTI	% sedseg area not remediated	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	85.16%	88.60%	N	0.5
49	Aug-04	100.00%	100.00%	N	0.5
50	Aug-04	94.75%	93.78%	N	0.5
51	Aug-04	11.55%	25.54%	N	0.5
52	Aug-04	9.52%	20.12%	C	0.25
53	Aug-04	29.84%	36.16%	N	0.5
54	Aug-04	52.23%	57.76%	N	0.5
55	Aug-04	90.31%	93.51%	N	0.5
56	Aug-04	0.34%	0.60%	C	0.25
57	Aug-04	8.08%	5.33%	N	0.5
58	Aug-04	5.32%	3.67%	N	0.5
59	Aug-04	0.00%	0.00%	C	0.25
60	Aug-04	0.90%	0.69%	N	0.5
61	Aug-04	0.89%	15.22%	C	0.25
62	Aug-05	42.15%	59.96%	N	0.5
63	Aug-05	31.85%	41.32%	N	0.5
64	Aug-05	0.23%	0.39%	C	0.25
65	Aug-05	0.80%	0.24%	N	0.5
66	Aug-05	28.28%	60.34%	C	0.25
67	Aug-05	91.40%	74.63%	N	0.5
68	Aug-05	25.23%	55.70%	C	0.25
69	Aug-05	77.13%	72.16%	N	0.5
70	Aug-05	0.02%	0.01%	C	0.25
71	Aug-05	0.75%	0.43%	N	0.5
72	Aug-05	1.08%	15.15%	C	0.25
73	Aug-05	25.06%	18.70%	N	0.5
74	Aug-05	40.54%	48.76%	N	0.5
75	Aug-05	64.91%	57.52%	C	0.25
76	Aug-05	14.59%	23.25%	N	0.5
77	Aug-05	44.58%	57.62%	N	0.5
78	Aug-05	7.36%	7.09%	C	0.25
79	Aug-05	71.36%	60.67%	N	0.5
80	Aug-05	1.64%	5.06%	C	0.25
81	Aug-06	5.15%	34.48%	C	0.25
82	Aug-06	81.81%	69.75%	N	0.5
83	Aug-06	80.73%	69.64%	N	0.5
84	Aug-06	6.85%	10.39%	C	0.25
85	Aug-06	46.23%	29.93%	N	0.5
86	Aug-06	23.23%	55.96%	N	0.5
87	Aug-06	51.64%	75.78%	N	0.5
88	Aug-06	5.39%	32.26%	C	0.25
89	Aug-06	53.13%	73.73%	N	0.5
90	Aug-06	32.92%	52.64%	C	0.25
91	Aug-06	99.76%	99.62%	N	0.5
92	Aug-06	3.50%	49.53%	C	0.25
93	Aug-06	99.73%	99.57%	N	0.5
94	Aug-06	15.06%	57.42%	C	0.25
95	Aug-06	81.64%	92.87%	N	0.5
96	No Change	No Change	No Change	No Change	No Change
97	No Change	No Change	No Change	No Change	No Change
98	No Change	No Change	No Change	No Change	No Change
99	No Change	No Change	No Change	No Change	No Change
100	No Change	No Change	No Change	No Change	No Change
101	No Change	No Change	No Change	No Change	No Change
102	No Change	No Change	No Change	No Change	No Change
103	No Change	No Change	No Change	No Change	No Change
104	No Change	No Change	No Change	No Change	No Change
105	No Change	No Change	No Change	No Change	No Change
106	Aug-07	31.16%	32.77%	C	0.25
107	Aug-07	86.25%	96.81%	N	0.5
108	No Change	No Change	No Change	No Change	No Change
109	No Change	No Change	No Change	No Change	No Change
110	No Change	No Change	No Change	No Change	No Change
111	No Change	No Change	No Change	No Change	No Change
112	Aug-07	21.28%	67.58%	C	0.25
113	Aug-07	12.15%	74.36%	N	0.5
114	No Change	No Change	No Change	No Change	No Change
115	No Change	No Change	No Change	No Change	No Change
116	No Change	No Change	No Change	No Change	No Change
117	No Change	No Change	No Change	No Change	No Change
118	No Change	No Change	No Change	No Change	No Change
119	No Change	No Change	No Change	No Change	No Change
120	No Change	No Change	No Change	No Change	No Change
121	No Change	No Change	No Change	No Change	No Change
122	No Change	No Change	No Change	No Change	No Change
123	No Change	No Change	No Change	No Change	No Change

R14S2
REM-3/10/hot spots 36, 37 & part of 39, plus channel to implement remediation

SedSeg#	Year to Remediate	% PCB Mass Remains to LTI	% sedseg area not remediated	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	85.2%	88.6%	N	0.5
49	Aug-04	100.0%	100.0%	N	0.5
50	Aug-04	94.7%	93.8%	N	0.5
51	Aug-04	9.2%	18.0%	N	0.5
52	Aug-04	9.6%	20.1%	C	0.25
53	Aug-04	29.8%	36.2%	N	0.5
54	Aug-04	52.2%	57.8%	N	0.5
55	Aug-04	90.3%	93.5%	N	0.5
56	Aug-04	0.4%	0.6%	C	0.25
57	Aug-04	11.7%	5.3%	N	0.5
58	Aug-04	5.8%	3.7%	N	0.5
59	Aug-04	0.0%	0.0%	C	0.25
60	Aug-04	0.7%	0.7%	N	0.5
61	Aug-04	0.9%	15.2%	C	0.25
62	Aug-04	42.2%	60.0%	N	0.5
63	Aug-05	28.6%	34.4%	N	0.5
64	Aug-05	0.2%	0.4%	C	0.25
65	Aug-05	2.2%	0.2%	N	0.5
66	Aug-05	28.3%	60.3%	C	0.25
67	Aug-05	91.4%	74.6%	N	0.5
68	Aug-05	24.6%	55.2%	C	0.25
69	Aug-05	59.1%	44.7%	N	0.5
70	Aug-05	0.0%	0.0%	C	0.25
71	Aug-05	0.8%	0.4%	N	0.5
72	Aug-05	0.6%	2.8%	C	0.25
73	Aug-05	24.2%	16.4%	N	0.5
74	Aug-05	8.3%	8.0%	N	0.5
75	Aug-05	66.9%	57.5%	C	0.25
76	Aug-06	14.6%	23.2%	N	0.5
77	Aug-06	44.6%	57.6%	N	0.5
78	Aug-06	7.4%	6.2%	C	0.25
79	Aug-06	64.5%	56.6%	N	0.5
80	Aug-06	1.0%	5.1%	C	0.25
81	Aug-06	8.9%	34.5%	C	0.25
82	Aug-06	81.8%	69.7%	N	0.5
83	Aug-06	80.7%	69.6%	N	0.5
84	Aug-06	7.0%	10.4%	C	0.25
85	Aug-06	46.2%	29.9%	N	0.5
86	Aug-06	22.1%	55.3%	N	0.5
87	Aug-06	51.5%	75.8%	N	0.5
88	Aug-06	5.7%	32.3%	C	0.25
89	Aug-06	53.1%	73.7%	N	0.5
90	Aug-07	43.0%	52.4%	C	0.25
91	Aug-07	99.5%	99.8%	N	0.5
92	Aug-07	18.2%	49.3%	C	0.25
93	Aug-07	96.9%	99.6%	N	0.5
94	Aug-07	10.8%	58.3%	C	0.25
95	Aug-07	63.4%	85.6%	N	0.5
96	Aug-07	100.0%	100.0%	N	0.5
97	Aug-07	100.0%	100.0%	N	0.5
98	Aug-07	100.0%	100.0%	C	0.25
99	Aug-07	100.0%	100.0%	N	0.5
100	Aug-07	100.0%	100.0%	C	0.25
101	Aug-07	100.0%	100.0%	N	0.5
102	Aug-07	99.9%	99.9%	C	0.25
103	Aug-07	98.7%	98.2%	N	0.5
104	Aug-07	100.0%	100.0%	C	0.25
105	Aug-07	98.1%	97.4%	N	0.5
106	Aug-08	5.4%	29.4%	C	0.25
107	Aug-08	68.3%	89.8%	N	0.5
108	Aug-08	100.0%	100.0%	C	0.25
109	Aug-08	100.0%	100.0%	N	0.5
110	Aug-08	99.7%	99.3%	C	0.25
111	Aug-08	99.0%	98.7%	N	0.5
112	Aug-08	9.4%	61.8%	C	0.25
113	Aug-08	18.4%	68.0%	N	0.5
114	Aug-08	100.0%	100.0%	C	0.25
115	Aug-08	97.6%	96.7%	N	0.5
116	Aug-08	85.1%	95.9%	C	0.25
117	Aug-08	84.1%	89.3%	N	0.5
118	Aug-08	100.0%	100.0%	C	0.25
119	Aug-08	99.6%	99.4%	N	0.5
120	Aug-08	88.0%	88.0%	C	0.25
121	Aug-08	99.9%	99.9%	N	0.5
122	Aug-08	98.7%	98.3%	N	0.5
123	Aug-08	100.0%	100.0%	N	0.5

SedSeg#	Year to Remediate	% PCB Mass Remains -(10% of cap area breached)	% sedseg area not remediated-(10% of cap area breached)	% sedseg area capped-(10% of cap area breached)	PCB conc. in capped area (26 cm of core) (ppm)	% of SedSeg area Dredged with >12' water depth	PCB conc. in dredged area w/ >12' water depth (top 10 cm of core) (ppm)	% of SedSeg area Dredged with <12' water depth	PCB conc. in dredged area w/ <12' water depth (26 cm of core) (ppm)	sediment type
Sediment Capping Base Case Alternative - 10% of cap missing										
Scenario R15AS2 CAP/SR-3/10/S + channel										
48	Aug-04	85.16%	88.60%	0.00%	0	0.00%	1	11.40%	0.25	N
49	Aug-04	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	N
50	Aug-04	94.75%	93.78%	0.00%	0	0.00%	1	6.22%	0.25	N
51	Aug-04	10.61%	25.43%	24.73%	0	9.70%	1	40.14%	0.25	N
52	Aug-04	17.64%	29.40%	57.01%	0	13.59%	1	0.00%	0.25	C
53	Aug-04	36.30%	41.28%	31.24%	0	11.39%	1	16.10%	0.25	N
54	Aug-04	52.63%	58.41%	5.08%	0	32.95%	1	3.56%	0.25	N
55	Aug-04	90.31%	93.51%	0.00%	0	1.18%	1	5.31%	0.25	N
56	Aug-04	10.72%	17.22%	80.67%	0	0.00%	1	2.12%	0.25	C
57	Aug-04	13.88%	10.19%	63.09%	0	0.00%	1	26.72%	0.25	N
58	Aug-04	12.06%	4.74%	17.04%	0	40.64%	1	37.57%	0.25	N
59	Aug-04	0.86%	1.45%	76.18%	0	14.60%	1	7.77%	0.25	C
60	Aug-04	5.02%	3.60%	79.82%	0	0.01%	1	16.57%	0.25	N
61	Aug-04	11.38%	23.21%	58.88%	0	8.19%	1	9.73%	0.25	C
62	Aug-04	42.16%	59.97%	23.38%	0	0.24%	1	16.41%	0.25	N
63	Aug-05	29.63%	34.95%	9.95%	0	17.68%	1	37.42%	0.25	N
64	Aug-05	8.21%	15.69%	84.25%	0	0.00%	1	0.06%	0.25	C
65	Aug-05	4.19%	1.95%	91.95%	0	0.00%	1	6.10%	0.25	N
66	Aug-05	30.23%	61.33%	26.56%	0	0.13%	1	11.98%	0.25	C
67	Aug-05	93.51%	80.75%	18.97%	0	0.00%	1	0.28%	0.25	N
68	Aug-05	25.42%	55.97%	3.44%	0	40.55%	1	0.04%	0.25	C
69	Aug-05	59.37%	44.73%	9.06%	0	35.76%	1	10.44%	0.25	N
70	Aug-05	10.80%	13.54%	72.00%	0	14.39%	1	0.07%	0.25	C
71	Aug-05	14.56%	7.34%	85.92%	0	5.15%	1	1.59%	0.25	N
72	Aug-05	16.08%	19.03%	58.56%	0	19.60%	1	2.80%	0.25	C
73	Aug-05	24.97%	17.58%	39.91%	0	10.43%	1	32.09%	0.25	N
74	Aug-05	9.50%	8.81%	2.77%	0	70.69%	1	17.73%	0.25	N
75	Aug-05	66.89%	57.83%	12.25%	0	8.57%	1	21.35%	0.25	C
76	Aug-06	14.59%	23.26%	57.45%	0	10.50%	1	8.79%	0.25	N
77	Aug-06	44.58%	57.63%	0.35%	0	7.24%	1	34.78%	0.25	N
78	Aug-06	18.61%	13.07%	73.89%	0	10.44%	1	2.59%	0.25	C
79	Aug-06	65.35%	58.71%	6.16%	0	12.42%	1	22.71%	0.25	N
80	Aug-06	7.45%	14.44%	81.00%	0	4.56%	1	0.01%	0.25	C
81	Aug-06	9.93%	36.81%	29.54%	0	5.85%	1	27.80%	0.25	C
82	Aug-06	81.81%	69.75%	8.13%	0	20.31%	1	1.81%	0.25	N
83	Aug-06	80.73%	69.81%	1.36%	0	26.87%	1	1.96%	0.25	N
84	Aug-06	7.83%	12.04%	79.20%	0	6.75%	1	2.01%	0.25	C
85	Aug-06	46.23%	30.00%	1.02%	0	20.57%	1	48.40%	0.25	N
86	Aug-06	27.73%	58.28%	25.78%	0	3.72%	1	12.22%	0.25	N
87	Aug-06	55.10%	77.18%	7.81%	0	10.12%	1	4.89%	0.25	N
88	Aug-06	7.73%	35.41%	36.02%	0	13.06%	1	15.51%	0.25	C
89	Aug-06	53.27%	73.96%	16.67%	0	7.05%	1	2.31%	0.25	N
90	Aug-07	43.04%	52.37%	0.00%	0	17.12%	1	30.51%	0.25	C
91	Aug-07	99.50%	99.81%	0.00%	0	0.16%	1	0.03%	0.25	N
92	Aug-07	25.00%	52.97%	35.67%	0	11.35%	1	0.01%	0.25	C
93	Aug-07	96.87%	99.56%	0.11%	0	0.34%	1	0.00%	0.25	N
94	Aug-07	19.84%	62.80%	33.81%	0	3.31%	1	0.08%	0.25	C
95	Aug-07	63.75%	85.77%	4.57%	0	9.39%	1	0.28%	0.25	N
96	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	N
97	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	N
98	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	C
99	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	N
100	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	C
101	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	N
102	Aug-07	99.90%	99.90%	0.00%	0	0.09%	1	0.01%	0.25	C
103	Aug-07	98.69%	98.19%	0.00%	0	1.59%	1	0.22%	0.25	N
104	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	C
105	Aug-07	98.11%	97.40%	0.00%	0	2.04%	1	0.56%	0.25	N
106	Aug-08	5.39%	29.40%	0.00%	0	2.23%	1	68.37%	0.25	C
107	Aug-08	68.28%	89.76%	0.00%	0	7.27%	1	2.98%	0.25	N
108	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	C
109	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	N
110	Aug-08	99.69%	99.32%	0.00%	0	0.66%	1	0.01%	0.25	C
111	Aug-08	99.03%	98.66%	0.00%	0	1.18%	1	0.16%	0.25	N
112	Aug-08	9.43%	61.79%	0.00%	0	4.32%	1	33.90%	0.25	C
113	Aug-08	18.38%	67.98%	0.00%	0	5.55%	1	26.47%	0.25	N
114	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	C
115	Aug-08	97.57%	96.66%	0.00%	0	3.25%	1	0.09%	0.25	N
116	Aug-08	85.11%	95.94%	0.00%	0	0.00%	1	4.06%	0.25	C
117	Aug-08	84.07%	91.41%	0.00%	0	1.69%	1	6.90%	0.25	N
118	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	C
119	Aug-08	99.56%	99.39%	0.00%	0	0.61%	1	0.00%	0.25	N
120	Aug-08	88.03%	88.03%	0.00%	0	8.76%	1	3.21%	0.25	C
121	Aug-08	99.93%	99.90%	0.00%	0	0.09%	1	0.02%	0.25	N
122	Aug-08	98.74%	98.26%	0.00%	0	1.31%	1	0.43%	0.25	N
123	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	0.00%	0.25	N

R16S2					
REM-0/0/3 plus channel to implement					
SedSeg #	Year to Dredge	% PCB Mass Remains	% sedseg area not dredged	sediment type	PCB conc. In dredge area (ppm)
48	Aug-04	29.85%	10.63%	N	0.5
49	Aug-04	12.32%	5.04%	N	0.5
50	Aug-04	0.31%	0.43%	N	0.5
51	Aug-04	0.19%	0.12%	N	0.5
52	Aug-04	0.00%	0.00%	C	0.25
53	Aug-04	0.00%	0.00%	N	0.5
54	Aug-04	0.00%	0.00%	N	0.5
55	Aug-04	0.00%	0.00%	N	0.5
56	Aug-04	0.33%	0.56%	C	0.25
57	Aug-04	7.88%	5.22%	N	0.5
58	Aug-05	5.25%	3.63%	N	0.5
59	Aug-05	0.00%	0.00%	C	0.25
60	Aug-05	0.00%	0.00%	N	0.5
61	Aug-05	0.00%	0.00%	C	0.25
62	Aug-05	0.08%	0.03%	N	0.5
63	Aug-05	0.00%	0.00%	N	0.5
64	Aug-05	0.00%	0.00%	C	0.25
65	Aug-05	0.00%	0.00%	N	0.5
66	Aug-05	1.04%	2.04%	C	0.25
67	Aug-05	0.56%	1.00%	N	0.5
68	Aug-05	1.96%	7.54%	C	0.25
69	Aug-05	2.31%	1.71%	N	0.5
70	Aug-05	0.00%	0.00%	C	0.25
71	Aug-05	0.00%	0.00%	N	0.5
72	Aug-06	0.22%	1.60%	C	0.25
73	Aug-06	3.83%	2.38%	N	0.5
74	Aug-06	8.94%	7.60%	N	0.5
75	Aug-06	48.41%	41.30%	C	0.25
76	Aug-06	3.32%	7.22%	N	0.5
77	Aug-06	0.11%	0.09%	N	0.5
78	Aug-06	6.37%	6.35%	C	0.25
79	Aug-06	15.26%	7.41%	N	0.5
80	Aug-06	1.27%	2.68%	C	0.25
81	Aug-06	0.00%	0.00%	C	0.25
82	Aug-06	0.00%	0.00%	N	0.5
83	Aug-06	21.26%	11.38%	N	0.5
84	Aug-06	5.72%	8.71%	C	0.25
85	Aug-06	35.50%	20.19%	N	0.5
86	Aug-06	0.00%	0.00%	N	0.5
87	Aug-07	0.32%	0.59%	N	0.5
88	Aug-07	0.00%	0.00%	C	0.25
89	Aug-07	2.01%	2.36%	N	0.5
90	Aug-07	11.59%	11.59%	C	0.25
91	Aug-07	8.09%	5.18%	N	0.5
92	Aug-08	5.10%	5.10%	C	0.25
93	Aug-08	9.84%	6.34%	N	0.5
94	Aug-09	2.01%	2.01%	C	0.25
95	Aug-09	8.93%	5.73%	N	0.5
96	Aug-09	100.00%	100.00%	N	0.5
97	Aug-09	100.00%	100.00%	N	0.5
98	Aug-09	100.00%	100.00%	C	0.25
99	Aug-09	100.00%	100.00%	N	0.5
100	Aug-09	100.00%	100.00%	C	0.25
101	Aug-09	100.00%	100.00%	N	0.5
102	Aug-09	90.20%	90.15%	C	0.25
103	Aug-09	97.11%	95.76%	N	0.5
104	Aug-09	85.29%	97.21%	C	0.25
105	Aug-09	92.18%	97.06%	N	0.5
106	Aug-10	5.39%	29.40%	C	0.25
107	Aug-10	68.28%	89.76%	N	0.5
108	Aug-10	100.00%	100.00%	C	0.25
109	Aug-10	100.00%	100.00%	N	0.5
110	Aug-10	99.69%	99.32%	C	0.25
111	Aug-10	99.03%	98.66%	N	0.5
112	Aug-10	9.43%	61.79%	C	0.25
113	Aug-10	18.39%	67.99%	N	0.5
114	Aug-10	100.00%	100.00%	C	0.25
115	Aug-10	97.57%	96.66%	N	0.5
116	Aug-10	46.42%	72.86%	C	0.25
117	Aug-10	43.31%	66.91%	N	0.5
118	Aug-10	100.00%	100.00%	C	0.25
119	Aug-10	99.56%	99.39%	N	0.5
120	Aug-10	88.03%	88.03%	C	0.25
121	Aug-10	99.93%	99.90%	N	0.5
122	Aug-10	98.74%	98.26%	N	0.5
123	Aug-10	100.00%	100.00%	N	0.5

Scenario R17 CAP-0/10/Hot Spots 36 and 37										
SedSeg#	Year to Remediate	% PCB Mass Remains - (10% of cap area breached)	% sedseg area not remediated (10% of cap area breached)	% sedseg area capped- (10% of cap area breached)	PCB conc. in capped area (26 cm of core) (ppm)	% of SedSeg area Dredged with >12' water depth	PCB conc. in dredged area w/ >12' water depth (top 10 cm of core) (ppm)	% of SedSeg area Dredged with <12' water depth	PCB conc. in dredged area w/ <12' water depth (26 cm of core) (ppm)	sediment type
48	Aug-04	29.93%	10.69%	0.00%	0	0.00%	1	89.31%	0.25	N
49	Aug-04	12.32%	5.04%	0.00%	0	2.27%	1	92.69%	0.25	N
50	Aug-04	3.63%	0.90%	0.14%	0	4.81%	1	94.16%	0.25	N
51	Aug-04	3.08%	0.00%	22.76%	0	21.12%	1	56.13%	0.25	N
52	Aug-04	16.53%	15.45%	60.73%	0	17.46%	1	6.36%	0.25	C
53	Aug-04	3.74%	3.10%	38.78%	0	26.88%	1	31.24%	0.25	N
54	Aug-04	0.19%	0.24%	5.69%	0	89.14%	1	4.93%	0.25	N
55	Aug-05	0.01%	0.01%	0.00%	0	37.03%	1	62.96%	0.25	N
56	Aug-05	9.05%	10.66%	87.22%	0	0.00%	1	2.12%	0.25	C
57	Aug-05	8.15%	5.43%	67.87%	0	0.00%	1	26.70%	0.25	N
58	Aug-05	5.78%	4.03%	17.76%	0	40.64%	1	37.57%	0.25	N
59	Aug-05	8.43%	11.52%	66.10%	0	14.60%	1	7.77%	0.25	C
60	Aug-05	16.42%	7.93%	75.47%	0	0.01%	1	16.59%	0.25	N
61	Aug-05	0.09%	0.10%	67.10%	0	8.93%	1	23.87%	0.25	C
62	Aug-05	33.96%	9.46%	14.06%	0	36.36%	1	40.12%	0.25	N
63	Aug-05	1.50%	0.59%	9.92%	0	42.16%	1	47.32%	0.25	N
64	Aug-06	7.30%	6.21%	93.73%	0	0.00%	1	0.06%	0.25	C
65	Aug-06	11.85%	6.81%	87.09%	0	0.00%	1	6.10%	0.25	N
66	Aug-06	11.59%	11.21%	44.55%	0	11.89%	1	32.35%	0.25	C
67	Aug-06	19.79%	8.19%	51.73%	0	9.75%	1	30.33%	0.25	N
68	Aug-06	1.96%	7.54%	4.20%	0	88.22%	1	0.04%	0.25	C
69	Aug-06	4.34%	3.00%	7.85%	0	71.08%	1	18.07%	0.25	N
70	Aug-06	8.44%	3.64%	81.49%	0	14.79%	1	0.07%	0.25	C
71	Aug-06	3.42%	2.58%	90.28%	0	5.55%	1	1.59%	0.25	N
72	Aug-06	4.62%	8.79%	71.30%	0	19.91%	1	0.00%	0.25	C
73	Aug-06	5.74%	5.35%	40.38%	0	12.61%	1	41.66%	0.25	N
74	Aug-06	10.75%	8.37%	3.15%	0	72.34%	1	16.13%	0.25	N
75	Aug-07	48.50%	41.45%	12.05%	0	24.44%	1	22.06%	0.25	C
76	Aug-07	20.50%	12.93%	51.83%	0	11.55%	1	23.69%	0.25	N
77	Aug-07	2.26%	0.95%	0.35%	0	29.37%	1	69.32%	0.25	N
78	Aug-07	6.96%	6.99%	79.39%	0	10.95%	1	2.67%	0.25	C
79	Aug-07	15.36%	7.53%	7.68%	0	57.69%	1	27.11%	0.25	N
80	Aug-07	5.14%	9.14%	83.95%	0	6.16%	1	0.74%	0.25	C
81	Aug-07	16.02%	4.64%	27.74%	0	7.69%	1	59.92%	0.25	C
82	Aug-07	6.34%	3.82%	6.11%	0	80.10%	1	9.97%	0.25	N
83	Aug-07	21.28%	11.39%	1.36%	0	84.03%	1	3.23%	0.25	N
84	Aug-07	7.78%	13.89%	75.89%	0	7.53%	1	2.70%	0.25	C
85	Aug-07	36.62%	20.94%	1.02%	0	30.29%	1	47.75%	0.25	N
86	Aug-07	7.46%	6.94%	49.51%	0	9.15%	1	34.40%	0.25	N
87	Aug-08	1.12%	2.46%	27.97%	0	35.79%	1	33.78%	0.25	N
88	Aug-08	17.27%	4.83%	34.45%	0	13.05%	1	47.66%	0.25	C
89	Aug-08	5.08%	5.69%	33.71%	0	8.87%	1	51.73%	0.25	N
90	Aug-08	43.04%	52.37%	0.00%	0	17.12%	1	30.51%	0.25	C
91	Aug-08	99.88%	99.81%	0.00%	0	0.16%	1	0.03%	0.25	N
92	Aug-08	24.76%	49.30%	39.34%	0	11.35%	1	0.01%	0.25	C
93	Aug-08	99.72%	99.56%	0.11%	0	0.34%	1	0.00%	0.25	N
94	Aug-08	15.90%	57.66%	39.05%	0	3.26%	1	0.04%	0.25	C
95	Aug-08	79.15%	92.41%	4.73%	0	2.87%	1	0.00%	0.25	N
96	No Change									N
97	No Change									N
98	No Change									C
99	No Change									N
100	No Change									C
101	No Change									N
102	No Change									C
103	No Change									N
104	No Change									C
105	No Change									N
106	Aug-09	31.16%	32.77%	0.00%	0	0.00%	1	67.23%	0.25	C
107	Aug-09	86.25%	96.81%	0.00%	0	0.00%	1	3.19%	0.25	N
108	No Change									C
109	No Change									N
110	No Change									C
111	No Change									N
112	Aug-09	21.28%	67.58%	0.00%	0	0.00%	1	32.42%	0.25	C
113	Aug-09	12.15%	74.36%	0.00%	0	0.00%	1	25.64%	0.25	N
114	No Change									C
115	No Change									N
116	No Change									C
117	No Change									N
118	No Change									C
119	No Change									N
120	No Change									C
121	No Change									N
122	No Change									N
123	No Change									N

Scenario R18 CAP-0/10/MNA										
SedSeg#	Year to Remediate	% PCB Mass Remains - (10% of cap area breached)	% sedseg area not remediated (10% of cap area breached)	% sedseg area capped- (10% of cap area breached)	PCB conc. in capped area (26 cm of core) (ppm)	% of SedSeg area Dredged with >12' water depth	PCB conc. in dredged area w/ >12' water depth (top 10 cm of core) (ppm)	% of SedSeg area Dredged with <12' water depth	PCB conc. in dredged area w/ <12' water depth (26 cm of core) (ppm)	sediment type
48	Aug-04	29.93%	10.69%	0.00%	0	0.00%	1	89.31%	0.25	N
49	Aug-04	12.32%	5.04%	0.00%	0	2.27%	1	92.69%	0.25	N
50	Aug-04	3.63%	0.90%	0.14%	0	4.81%	1	94.16%	0.25	N
51	Aug-04	3.08%	0.00%	22.76%	0	21.12%	1	56.13%	0.25	N
52	Aug-04	16.53%	15.45%	60.73%	0	17.46%	1	6.36%	0.25	C
53	Aug-04	3.74%	3.10%	38.78%	0	26.88%	1	31.24%	0.25	N
54	Aug-04	0.19%	0.24%	5.69%	0	89.14%	1	4.93%	0.25	N
55	Aug-05	0.01%	0.01%	0.00%	0	37.03%	1	62.96%	0.25	N
56	Aug-05	9.05%	10.66%	87.22%	0	0.00%	1	2.12%	0.25	C
57	Aug-05	8.15%	5.43%	67.87%	0	0.00%	1	26.70%	0.25	N
58	Aug-05	5.78%	4.03%	17.76%	0	40.64%	1	37.57%	0.25	N
59	Aug-05	8.43%	11.52%	66.10%	0	14.60%	1	7.77%	0.25	C
60	Aug-05	16.42%	7.93%	75.47%	0	0.01%	1	16.59%	0.25	N
61	Aug-05	0.09%	0.10%	67.10%	0	8.93%	1	23.87%	0.25	C
62	Aug-05	33.96%	9.46%	14.06%	0	36.36%	1	40.12%	0.25	N
63	Aug-05	1.50%	0.59%	9.92%	0	42.16%	1	47.32%	0.25	N
64	Aug-06	7.30%	6.21%	93.73%	0	0.00%	1	0.06%	0.25	C
65	Aug-06	11.85%	6.81%	87.09%	0	0.00%	1	6.10%	0.25	N
66	Aug-06	11.59%	11.21%	44.55%	0	11.89%	1	32.35%	0.25	C
67	Aug-06	19.79%	8.19%	51.73%	0	9.75%	1	30.33%	0.25	N
68	Aug-06	1.96%	7.54%	4.20%	0	88.22%	1	0.04%	0.25	C
69	Aug-06	4.34%	3.00%	7.85%	0	71.08%	1	18.07%	0.25	N
70	Aug-06	8.44%	3.64%	81.49%	0	14.79%	1	0.07%	0.25	C
71	Aug-06	3.42%	2.58%	90.28%	0	5.55%	1	1.59%	0.25	N
72	Aug-06	4.62%	8.79%	71.30%	0	19.91%	1	0.00%	0.25	C
73	Aug-06	5.74%	5.35%	40.38%	0	12.61%	1	41.66%	0.25	N
74	Aug-06	10.75%	8.37%	3.15%	0	72.34%	1	16.13%	0.25	N
75	Aug-06	48.50%	41.45%	12.05%	0	24.44%	1	22.06%	0.25	C
76	Aug-06	20.50%	12.93%	51.83%	0	11.55%	1	23.69%	0.25	N
77	Aug-07	2.26%	0.95%	0.35%	0	29.37%	1	69.32%	0.25	N
78	Aug-07	6.96%	6.99%	79.39%	0	10.95%	1	2.67%	0.25	C
79	Aug-07	15.36%	7.53%	7.68%	0	57.69%	1	27.11%	0.25	N
80	Aug-07	5.14%	9.14%	83.95%	0	6.16%	1	0.74%	0.25	C
81	Aug-07	16.02%	4.64%	27.74%	0	7.69%	1	59.92%	0.25	C
82	Aug-07	6.34%	3.82%	6.11%	0	80.10%	1	9.97%	0.25	N
83	Aug-07	21.28%	11.39%	1.36%	0	84.03%	1	3.23%	0.25	N
84	Aug-07	7.78%	13.89%	75.89%	0	7.53%	1	2.70%	0.25	C
85	Aug-07	36.62%	20.94%	1.02%	0	30.29%	1	47.75%	0.25	N
86	Aug-07	7.46%	6.94%	49.51%	0	9.15%	1	34.40%	0.25	N
87	Aug-07	1.12%	2.46%	27.97%	0	35.79%	1	33.78%	0.25	N
88	Aug-08	17.27%	4.83%	34.45%	0	13.05%	1	47.66%	0.25	C
89	Aug-08	5.08%	5.69%	33.71%	0	8.87%	1	51.73%	0.25	N
90	Aug-08	43.04%	52.37%	0.00%	0	17.12%	1	30.51%	0.25	C
91	Aug-08	99.88%	99.81%	0.00%	0	0.16%	1	0.03%	0.25	N
92	Aug-08	24.76%	49.30%	39.34%	0	11.35%	1	0.01%	0.25	C
93	Aug-08	99.72%	99.56%	0.11%	0	0.34%	1	0.00%	0.25	N
94	Aug-08	15.90%	57.66%	39.05%	0	3.26%	1	0.04%	0.25	C
95	Aug-08	79.15%	92.41%	4.73%	0	2.87%	1	0.00%	0.25	N
96	No Change									N
97	No Change									N
98	No Change									C
99	No Change									N
100	No Change									C
101	No Change									N
102	No Change									C
103	No Change									N
104	No Change									C
105	No Change									N
106	No Change									C
107	No Change									N
108	No Change									C
109	No Change									N
110	No Change									C
111	No Change									N
112	No Change									C
113	No Change									N
114	No Change									C
115	No Change									N
116	No Change									C
117	No Change									N
118	No Change									C
119	No Change									N
120	No Change									C
121	No Change									N
122	No Change									N
123	No Change									N

Scenario R19 CAP-0/MNA/MNA

SedSeg#	Year to Remediate	% PCB Mass Remains - (10% of cap area breached)	% sedseg area not remediated- (10% of cap area breached)	% sedseg area capped- (10% of cap area breached)	PCB conc. in capped area (26 cm of core) (ppm)	% of SedSeg area Dredged with >12' water depth	PCB conc. in dredged area w/ >12' water depth (top 10 cm of core) (ppm)	% of SedSeg area Dredged with <12' water depth	PCB conc. in dredged area w/ <12' water depth (26 cm of core) (ppm)	sediment type
48	Aug-04	29.93%	10.69%	0.00%	0	0.00%	1	89.31%	0.25	N
49	Aug-04	12.32%	5.04%	0.00%	0	2.27%	1	92.69%	0.25	N
50	Aug-04	3.63%	0.90%	0.14%	0	4.81%	1	94.16%	0.25	N
51	Aug-04	3.08%	0.00%	22.76%	0	21.12%	1	56.13%	0.25	N
52	Aug-04	16.53%	15.45%	60.73%	0	17.46%	1	6.36%	0.25	C
53	Aug-04	3.74%	3.10%	38.78%	0	26.88%	1	31.24%	0.25	N
54	Aug-04	0.19%	0.24%	5.69%	0	89.14%	1	4.93%	0.25	N
55	Aug-04	0.01%	0.01%	0.00%	0	37.03%	1	62.96%	0.25	N
56	Aug-05	9.05%	10.66%	87.22%	0	0.00%	1	2.12%	0.25	C
57	Aug-05	8.15%	5.43%	67.87%	0	0.00%	1	26.70%	0.25	N
58	Aug-05	5.78%	4.03%	17.76%	0	40.64%	1	37.57%	0.25	N
59	Aug-05	8.43%	11.52%	66.10%	0	14.60%	1	7.77%	0.25	C
60	Aug-05	16.42%	7.93%	75.47%	0	0.01%	1	16.59%	0.25	N
61	Aug-05	0.09%	0.10%	67.10%	0	8.93%	1	23.87%	0.25	C
62	Aug-05	33.96%	9.46%	14.06%	0	36.36%	1	40.12%	0.25	N
63	Aug-05	1.50%	0.59%	9.92%	0	42.16%	1	47.32%	0.25	N
64	Aug-05	7.30%	6.21%	93.73%	0	0.00%	1	0.06%	0.25	C
65	Aug-05	11.85%	6.81%	87.09%	0	0.00%	1	6.10%	0.25	N
66	Aug-06	11.59%	11.21%	44.55%	0	11.89%	1	32.35%	0.25	C
67	Aug-06	19.79%	8.19%	51.73%	0	9.75%	1	30.33%	0.25	N
68	Aug-06	1.96%	7.54%	4.20%	0	88.22%	1	0.04%	0.25	C
69	Aug-06	4.34%	3.00%	7.85%	0	71.08%	1	18.07%	0.25	N
70	Aug-06	8.44%	3.64%	81.49%	0	14.79%	1	0.07%	0.25	C
71	Aug-06	3.42%	2.58%	90.28%	0	5.55%	1	1.59%	0.25	N
72	Aug-06	4.62%	8.79%	71.30%	0	19.91%	1	0.00%	0.25	C
73	Aug-06	5.74%	5.35%	40.38%	0	12.61%	1	41.66%	0.25	N
74	Aug-06	10.75%	8.37%	3.15%	0	72.34%	1	16.13%	0.25	N
75	Aug-06	48.50%	41.45%	12.05%	0	24.44%	1	22.06%	0.25	C
76	Aug-06	20.50%	12.93%	51.83%	0	11.55%	1	23.69%	0.25	N
77	Aug-06	2.26%	0.95%	0.35%	0	29.37%	1	69.32%	0.25	N
78	Aug-06	6.96%	6.99%	79.39%	0	10.95%	1	2.67%	0.25	C
79	Aug-06	15.36%	7.53%	7.68%	0	57.69%	1	27.11%	0.25	N
80	Aug-07	5.14%	9.14%	83.95%	0	6.16%	1	0.74%	0.25	C
81	Aug-07	16.02%	4.64%	27.74%	0	7.69%	1	59.92%	0.25	C
82	Aug-07	6.34%	3.82%	6.11%	0	80.10%	1	9.97%	0.25	N
83	Aug-07	21.28%	11.39%	1.36%	0	84.03%	1	3.23%	0.25	N
84	Aug-07	7.78%	13.89%	75.89%	0	7.53%	1	2.70%	0.25	C
85	Aug-07	36.62%	20.94%	1.02%	0	30.29%	1	47.75%	0.25	N
86	Aug-07	7.46%	6.94%	49.51%	0	9.15%	1	34.40%	0.25	N
87	Aug-07	1.12%	2.46%	27.97%	0	35.79%	1	33.78%	0.25	N
88	Aug-07	17.27%	4.83%	34.45%	0	13.05%	1	47.66%	0.25	C
89	Aug-07	5.08%	5.69%	33.71%	0	8.87%	1	51.73%	0.25	N
90	No Change									C
91	No Change									N
92	No Change									C
93	No Change									N
94	No Change									C
95	No Change									N
96	No Change									N
97	No Change									N
98	No Change									C
99	No Change									N
100	No Change									C
101	No Change									N
102	No Change									C
103	No Change									N
104	No Change									C
105	No Change									N
106	No Change									C
107	No Change									N
108	No Change									C
109	No Change									N
110	No Change									C
111	No Change									N
112	No Change									C
113	No Change									N
114	No Change									C
115	No Change									N
116	No Change									C
117	No Change									N
118	No Change									C
119	No Change									N
120	No Change									C
121	No Change									N
122	No Change									N
123	No Change									N

Sediment Capping Sensitivity Analysis - 15% of cap defective

Scenario R15S15 CAP/SR-3/10/S + channel (15% defective cap)

SedSeg#	Year to Remediate	% PCB Mass Remains (15% of cap area breached)	% sedseg area not remediated (15% of cap area breached)	% sedseg area capped (15% of cap area breached)	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged (15% of cap area breached)	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	Aug-04	85.16%	88.60%	0.00%	0	11.40%	1	N
49	Aug-04	100.00%	100.00%	0.00%	0	0.00%	1	N
50	Aug-04	94.75%	93.78%	0.00%	0	6.22%	1	N
51	Aug-04	11.05%	27.28%	22.89%	0	49.84%	1	N
52	Aug-04	19.45%	35.79%	50.63%	0	13.59%	1	C
53	Aug-04	38.08%	42.25%	30.26%	0	27.49%	1	N
54	Aug-04	53.22%	59.81%	3.68%	0	36.51%	1	N
55	Aug-04	90.31%	93.51%	0.00%	0	6.49%	1	N
56	Aug-04	21.61%	28.69%	69.19%	0	2.12%	1	C
57	Aug-04	16.12%	13.60%	59.68%	0	26.72%	1	N
58	Aug-04	12.48%	5.17%	16.61%	0	78.22%	1	N
59	Aug-04	0.86%	1.45%	76.18%	0	22.38%	1	C
60	Aug-04	5.14%	3.85%	79.57%	0	16.58%	1	N
61	Aug-04	20.43%	30.41%	51.67%	0	17.92%	1	C
62	Aug-04	47.45%	62.23%	21.12%	0	16.65%	1	N
63	Aug-05	30.74%	35.71%	9.19%	0	55.10%	1	N
64	Aug-05	10.53%	21.49%	78.45%	0	0.06%	1	C
65	Aug-05	18.45%	11.40%	82.50%	0	6.10%	1	N
66	Aug-05	40.22%	66.91%	20.99%	0	12.11%	1	C
67	Aug-05	93.52%	80.78%	18.94%	0	0.28%	1	N
68	Aug-05	25.42%	55.97%	3.44%	0	40.59%	1	C
69	Aug-05	59.37%	44.73%	9.06%	0	46.21%	1	N
70	Aug-05	14.35%	24.29%	61.25%	0	14.46%	1	C
71	Aug-05	18.16%	9.20%	84.06%	0	6.74%	1	N
72	Aug-05	16.30%	21.40%	56.19%	0	22.41%	1	C
73	Aug-05	25.91%	19.26%	38.23%	0	42.52%	1	N
74	Aug-05	9.50%	8.81%	2.77%	0	88.42%	1	N
75	Aug-05	66.89%	57.83%	12.25%	0	29.92%	1	C
76	Aug-06	14.59%	23.26%	57.45%	0	19.29%	1	N
77	Aug-06	44.58%	57.63%	0.35%	0	42.02%	1	N
78	Aug-06	18.73%	13.18%	73.79%	0	13.03%	1	C
79	Aug-06	65.96%	59.86%	5.01%	0	35.13%	1	N
80	Aug-06	7.77%	14.72%	80.72%	0	4.56%	1	C
81	Aug-06	13.25%	38.05%	28.29%	0	33.66%	1	C
82	Aug-06	81.81%	69.75%	8.13%	0	22.13%	1	N
83	Aug-06	80.73%	69.81%	1.36%	0	28.83%	1	N
84	Aug-06	7.83%	12.04%	79.20%	0	8.76%	1	C
85	Aug-06	46.23%	30.00%	1.02%	0	68.98%	1	N
86	Aug-06	30.45%	60.33%	23.73%	0	15.94%	1	N
87	Aug-06	55.10%	77.18%	7.81%	0	15.01%	1	N
88	Aug-06	7.73%	35.41%	36.02%	0	28.57%	1	C
89	Aug-06	53.27%	73.96%	16.67%	0	9.36%	1	N
90	Aug-07	43.04%	52.37%	0.00%	0	47.63%	1	C
91	Aug-07	99.50%	99.81%	0.00%	0	0.19%	1	N
92	Aug-07	30.91%	56.16%	32.48%	0	11.36%	1	C
93	Aug-07	96.87%	99.56%	0.11%	0	0.34%	1	N
94	Aug-07	21.09%	63.30%	33.31%	0	3.39%	1	C
95	Aug-07	64.44%	85.84%	4.49%	0	9.67%	1	N
96	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	N
97	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	N
98	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	C
99	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	N
100	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	C
101	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	N
102	Aug-07	99.90%	99.90%	0.00%	0	0.10%	1	C
103	Aug-07	98.69%	98.19%	0.00%	0	1.81%	1	N
104	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	C
105	Aug-07	98.11%	97.40%	0.00%	0	2.60%	1	N
106	Aug-08	5.39%	29.40%	0.00%	0	70.60%	1	C
107	Aug-08	68.28%	89.76%	0.00%	0	10.24%	1	N
108	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	C
109	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	N
110	Aug-08	99.69%	99.32%	0.00%	0	0.68%	1	C
111	Aug-08	99.03%	98.66%	0.00%	0	1.34%	1	N
112	Aug-08	9.43%	61.79%	0.00%	0	38.21%	1	C
113	Aug-08	18.38%	67.98%	0.00%	0	32.02%	1	N
114	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	C
115	Aug-08	97.57%	96.66%	0.00%	0	3.34%	1	N
116	Aug-08	85.11%	95.94%	0.00%	0	4.06%	1	C
117	Aug-08	84.07%	91.41%	0.00%	0	8.59%	1	N
118	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	C
119	Aug-08	99.56%	99.39%	0.00%	0	0.61%	1	N
120	Aug-08	88.03%	88.03%	0.00%	0	11.97%	1	C
121	Aug-08	99.93%	99.90%	0.00%	0	0.10%	1	N
122	Aug-08	98.74%	98.26%	0.00%	0	1.74%	1	N
123	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	N

Sediment Capping Sensitivity Analysis - 25% of cap defective

Scenario R15S25 CAP/SR-3/10/S + channel (25% defective cap)

SedSeg#	Year to Remediate	% PCB Mass Remains (25% of cap area breached)	% sedseg area not remediated (25% of cap area breached)	% sedseg area capped (25% of cap area breached)	PCB conc. in capped area (26 cm of core) (ppm)	% sedseg area dredged (25% of cap area breached)	PCB conc. in dredged area (top 10 cm of core) (ppm)	sediment type
48	Aug-04	85.16%	88.60%	0.00%	0	11.40%	1	N
49	Aug-04	100.00%	100.00%	0.00%	0	0.00%	1	N
50	Aug-04	94.75%	93.78%	0.00%	0	6.22%	1	N
51	Aug-04	11.06%	27.29%	22.87%	0	49.84%	1	N
52	Aug-04	20.13%	41.37%	45.05%	0	13.59%	1	C
53	Aug-04	47.93%	45.64%	26.87%	0	27.49%	1	N
54	Aug-04	54.62%	61.22%	2.27%	0	36.51%	1	N
55	Aug-04	90.31%	93.51%	0.00%	0	6.49%	1	N
56	Aug-04	33.01%	45.63%	52.25%	0	2.12%	1	C
57	Aug-04	26.09%	20.45%	52.83%	0	26.72%	1	N
58	Aug-04	14.90%	6.78%	15.00%	0	78.22%	1	N
59	Aug-04	27.13%	20.92%	56.70%	0	22.38%	1	C
60	Aug-04	23.74%	16.42%	67.00%	0	16.58%	1	N
61	Aug-04	24.12%	33.22%	48.86%	0	17.92%	1	C
62	Aug-04	59.78%	65.25%	18.10%	0	16.65%	1	N
63	Aug-05	31.10%	35.94%	8.96%	0	55.10%	1	N
64	Aug-05	23.48%	40.48%	59.46%	0	0.06%	1	C
65	Aug-05	41.12%	20.65%	73.25%	0	6.10%	1	N
66	Aug-05	40.22%	66.91%	20.99%	0	12.11%	1	C
67	Aug-05	93.52%	80.79%	18.94%	0	0.28%	1	N
68	Aug-05	27.44%	56.35%	3.06%	0	40.59%	1	C
69	Aug-05	60.89%	45.61%	8.18%	0	46.21%	1	N
70	Aug-05	22.19%	29.69%	55.85%	0	14.46%	1	C
71	Aug-05	24.34%	19.30%	73.96%	0	6.74%	1	N
72	Aug-05	17.28%	24.37%	53.23%	0	22.41%	1	C
73	Aug-05	30.83%	26.12%	31.36%	0	42.52%	1	N
74	Aug-05	9.63%	9.13%	2.44%	0	88.42%	1	N
75	Aug-05	66.98%	57.97%	12.11%	0	29.92%	1	C
76	Aug-06	15.55%	25.84%	54.87%	0	19.29%	1	N
77	Aug-06	44.59%	57.66%	0.32%	0	42.02%	1	N
78	Aug-06	29.41%	20.33%	66.64%	0	13.03%	1	C
79	Aug-06	65.96%	59.86%	5.01%	0	35.13%	1	N
80	Aug-06	19.48%	28.16%	67.27%	0	4.56%	1	C
81	Aug-06	25.35%	44.35%	22.00%	0	33.66%	1	C
82	Aug-06	82.37%	70.70%	7.17%	0	22.13%	1	N
83	Aug-06	80.73%	69.81%	1.36%	0	28.83%	1	N
84	Aug-06	14.47%	21.29%	69.95%	0	8.76%	1	C
85	Aug-06	46.23%	30.00%	1.02%	0	68.98%	1	N
86	Aug-06	33.03%	61.12%	22.94%	0	15.94%	1	N
87	Aug-06	55.60%	77.47%	7.53%	0	15.01%	1	N
88	Aug-06	10.10%	37.51%	33.92%	0	28.57%	1	C
89	Aug-06	53.42%	74.01%	16.63%	0	9.36%	1	N
90	Aug-07	43.04%	52.37%	0.00%	0	47.63%	1	C
91	Aug-07	99.50%	99.81%	0.00%	0	0.19%	1	N
92	Aug-07	37.51%	59.53%	29.11%	0	11.36%	1	C
93	Aug-07	97.31%	99.61%	0.05%	0	0.34%	1	N
94	Aug-07	27.11%	67.60%	29.01%	0	3.39%	1	C
95	Aug-07	65.19%	85.98%	4.36%	0	9.67%	1	N
96	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	N
97	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	N
98	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	C
99	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	N
100	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	C
101	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	N
102	Aug-07	99.90%	99.90%	0.00%	0	0.10%	1	C
103	Aug-07	98.69%	98.19%	0.00%	0	1.81%	1	N
104	Aug-07	100.00%	100.00%	0.00%	0	0.00%	1	C
105	Aug-07	98.11%	97.40%	0.00%	0	2.60%	1	N
106	Aug-08	5.39%	29.40%	0.00%	0	70.60%	1	C
107	Aug-08	68.28%	89.76%	0.00%	0	10.24%	1	N
108	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	C
109	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	N
110	Aug-08	99.69%	99.32%	0.00%	0	0.68%	1	C
111	Aug-08	99.03%	98.66%	0.00%	0	1.34%	1	N
112	Aug-08	9.43%	61.79%	0.00%	0	38.21%	1	C
113	Aug-08	18.38%	67.98%	0.00%	0	32.02%	1	N
114	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	C
115	Aug-08	97.57%	96.66%	0.00%	0	3.34%	1	N
116	Aug-08	85.11%	95.94%	0.00%	0	4.06%	1	C
117	Aug-08	84.07%	91.41%	0.00%	0	8.59%	1	N
118	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	C
119	Aug-08	99.56%	99.39%	0.00%	0	0.61%	1	N
120	Aug-08	88.03%	88.03%	0.00%	0	11.97%	1	C
121	Aug-08	99.93%	99.90%	0.00%	0	0.10%	1	N
122	Aug-08	98.74%	98.26%	0.00%	0	1.74%	1	N
123	Aug-08	100.00%	100.00%	0.00%	0	0.00%	1	N

HUDSON RIVER PCBs REASSESSMENT FS

APPENDIX D

MODEL INTERPRETATION, SPECIFICATIONS AND RESULTS

D.3 Model Results

Table RE1
Tri+ PCB Load Over Thompson Island Dam

	Two Step Upstream Boundary Assumption (0.16 kg/day>0.0256 kg/day)												
Year	P3NAs2 (No Action)	r01s2 (0/0/3)	r02s2 (0/10/mna)	r03s2 (0/mna/mna)	r04s2 (3/10/10)	r05s2 (3/mna/mna)	r06s2 (0/10/10)	r07s2 (10/mna/mna)	r08s2 (0/0/3)	r09s2 (3/10/10)	r10s2 (10/mna/mna)	r11s2 (3 plus channel/10/ Hot Spots 36 & 37)	r12s2 (0/10/Hot Spots 36 & 37)
1998	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82
1999	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34
2000	123.43	123.43	123.43	123.43	123.43	123.43	123.43	123.43	123.43	123.43	123.43	123.43	123.43
2001	135.08	135.08	135.08	135.08	135.08	135.08	135.08	135.08	135.08	135.08	135.08	135.08	135.08
2002	106.04	106.04	106.04	106.04	106.04	106.04	106.04	106.04	106.04	106.04	106.04	106.04	106.04
2003	103.50	103.50	103.50	103.50	103.50	103.50	103.50	103.50	103.50	103.50	103.50	103.50	103.50
2004	90.99	88.01	88.50	88.01	88.70	88.98	88.30	89.25	88.14	88.59	89.25	88.59	88.64
2005	51.81	38.95	41.24	38.95	42.10	43.36	40.44	44.41	39.37	41.79	44.42	41.75	41.49
2006	57.19	28.06	34.03	28.06	36.14	37.61	32.42	42.25	28.45	35.80	42.25	34.69	34.20
2007	56.80	17.49	23.91	17.49	29.17	29.19	22.14	40.93	17.52	28.71	41.03	26.03	24.87
2008	38.11	12.68	13.31	12.68	21.52	21.54	12.69	29.23	12.64	21.14	29.22	17.19	13.97
2009	37.68	12.67	12.75	12.67	21.19	21.20	12.68	28.66	12.65	20.84	28.66	17.05	12.78
2010	50.72	15.09	15.18	15.08	27.21	27.23	15.10	37.67	15.16	26.83	37.77	21.62	15.33
2011	43.72	13.74	13.82	13.74	23.69	23.71	13.76	32.33	13.78	23.38	32.46	19.06	13.92
2012	40.47	13.31	13.38	13.31	22.33	22.35	13.32	30.16	13.35	22.04	30.29	18.12	13.48
2013	40.35	13.34	13.40	13.34	22.29	22.31	13.35	30.02	13.42	22.05	30.19	18.18	13.54
2014	33.15	12.27	12.32	12.27	19.29	19.31	12.28	25.35	12.35	19.11	25.44	16.04	12.44
2015	31.06	11.98	12.02	11.97	18.45	18.46	11.98	24.02	12.05	18.29	24.10	15.46	12.14
2016	23.84	10.55	10.58	10.54	15.21	15.22	10.55	19.25	10.57	15.06	19.29	12.97	10.63
2017	23.25	10.58	10.61	10.57	15.00	15.01	10.58	18.83	10.60	14.87	18.87	12.89	10.66
2018	26.37	10.96	11.00	10.96	15.90	15.91	10.97	20.18	11.03	15.81	20.30	13.62	11.09
2019	20.77	9.94	9.96	9.93	13.68	13.69	9.94	16.90	9.97	13.59	16.94	11.91	10.02
2020	22.33	10.59	10.62	10.59	14.70	14.70	10.60	18.16	10.65	14.61	18.22	12.81	10.70
2021	20.46	10.15	10.17	10.15	13.72	13.72	10.15	16.74	10.20	13.65	16.80	12.09	10.24
2022	17.57	9.57	9.59	9.57	12.42	12.43	9.57	14.84	9.60	12.36	14.87	11.10	9.64
2023	16.86	9.48	9.49	9.48	12.12	12.12	9.48	14.34	9.51	12.06	14.38	10.91	9.54
2024	20.75	10.44	10.46	10.44	13.86	13.87	10.44	16.73	10.52	13.82	16.81	12.38	10.55
2025	17.02	9.67	9.68	9.67	12.26	12.26	9.67	14.42	9.72	12.21	14.46	11.11	9.74
2026	16.74	9.66	9.67	9.65	12.11	12.11	9.66	14.15	9.71	12.07	14.20	11.04	9.73
2027	15.27	9.35	9.36	9.35	11.46	11.46	9.35	13.20	9.39	11.41	13.24	10.53	9.41
2028	15.76	9.57	9.58	9.57	11.73	11.73	9.57	13.51	9.62	11.69	13.56	10.80	9.64
2029	15.19	9.50	9.51	9.49	11.49	11.50	9.50	13.14	9.54	11.46	13.18	10.64	9.56
2030	14.95	9.71	9.72	9.71	11.59	11.59	9.72	13.12	9.76	11.56	13.16	10.79	9.78
2031	16.04	9.75	9.76	9.75	11.79	11.80	9.75	13.47	9.81	11.78	13.56	10.95	9.83
2032	14.26	9.37	9.38	9.37	11.03	11.03	9.38	12.37	9.42	11.00	12.43	10.34	9.44
2033	13.31	9.18	9.18	9.18	10.61	10.61	9.18	11.77	9.22	10.59	11.81	10.02	9.23
2034	13.51	9.50	9.51	9.50	10.95	10.95	9.50	12.10	9.54	10.93	12.14	10.36	9.55
2035	13.49	9.47	9.47	9.47	10.90	10.90	9.47	12.04	9.51	10.88	12.08	10.33	9.53
2036	13.61	9.43	9.44	9.43	10.79	10.80	9.43	11.89	9.48	10.78	11.96	10.25	9.49
2037	13.75	9.37	9.38	9.37	10.63	10.63	9.37	11.66	9.42	10.62	11.77	10.13	9.43
2038	12.07	8.99	9.00	8.99	10.00	10.00	9.00	10.80	9.03	9.98	10.86	9.60	9.03
2039	14.17	9.69	9.70	9.69	10.92	10.92	9.69	11.92	9.74	10.91	12.06	10.45	9.75
2040	11.62	8.86	8.87	8.86	9.71	9.71	8.86	10.39	8.89	9.69	10.45	9.38	8.90
2041	11.52	9.19	9.19	9.19	10.00	10.00	9.19	10.64	9.22	9.99	10.68	9.68	9.23
2042	9.98	8.36	8.36	8.36	8.96	8.96	8.36	9.43	8.38	8.94	9.44	8.72	8.38
2043	12.92	9.72	9.72	9.72	10.66	10.67	9.72	11.42	9.76	10.65	11.50	10.31	9.76
2044	12.39	9.46	9.47	9.46	10.30	10.30	9.47	10.96	9.50	10.29	11.05	9.99	9.50
2045	11.63	9.07	9.07	9.07	9.80	9.80	9.07	10.37	9.10	9.79	10.45	9.52	9.10
2046	10.62	8.95	8.95	8.95	9.54	9.54	8.95	9.99	8.97	9.53	10.02	9.32	8.98
2047	10.64	8.81	8.82	8.81	9.36	9.36	8.81	9.78	8.84	9.36	9.82	9.16	8.85
2048	11.74	8.83	8.83	8.83	9.34	9.34	8.83	9.76	8.91	9.40	9.83	9.21	8.91
2049	10.78	8.49	8.49	8.49	8.91	8.91	8.49	9.26	8.55	8.96	9.30	8.80	8.55
2050	12.07	9.02	9.02	9.02	9.53	9.53	9.02	9.95	9.10	9.60	10.02	9.41	9.11
2051	11.90	9.21	9.21	9.21	9.67	9.67	9.21	10.05	9.29	9.74	10.11	9.57	9.29
2052	10.29	8.60	8.60	8.59	8.95	8.95	8.60	9.23	8.64	8.98	9.26	8.85	8.64
2053	9.97	8.45	8.45	8.45	8.77	8.77	8.45	9.02	8.49	8.79	9.04	8.68	8.49
2054	9.83	8.45	8.45	8.44	8.74	8.74	8.45	8.98	8.48	8.77	9.00	8.66	8.48
2055	10.76	8.96	8.96	8.96	9.33	9.33	8.96	9.61	9.01	9.36	9.64	9.24	9.02
2056	8.90	8.19	8.19	8.19	8.41	8.41	8.19	8.58	8.20	8.41	8.58	8.34	8.21
2057	9.58	8.71	8.71	8.71	8.95	8.95	8.71	9.13	8.73	8.96	9.14	8.87	8.73
2058	9.53	8.63	8.63	8.63	8.89	8.90	8.63	9.09	8.65	8.90	9.10	8.81	8.65
2059	9.34	8.52	8.52	8.52	8.74	8.74	8.52	8.91	8.55	8.75	8.92	8.68	8.55
2060	10.29	9.17	9.17	9.17	9.43	9.43	9.17	9.63	9.20	9.45	9.64	9.36	9.20
2061	10.60	9.45	9.45	9.45	9.73	9.73	9.45	9.94	9.48	9.75	9.95	9.66	9.49
2062	9.08	8.47	8.47	8.47	8.65	8.65	8.47	8.78	8.50	8.65	8.79	8.59	8.50
2063	9.03	8.49	8.47	8.47	8.64	8.64	8.47	8.76	8.54	8.64	8.77	8.59	8.55
2064	8.94	8.42	8.39	8.39	8.55	8.55	8.39	8.67	8.47	8.56	8.67	8.50	8.47
2065	9.42	8.96	8.94	8.94	9.11	9.11	8.94	9.22	9.00	9.11	9.23	9.05	9.00
2066	9.04	8.60	8.59	8.59	8.74	8.74	8.59	8.84	8.64	8.74	8.85	8.69	8.64
2067	8.83	8.42	8.40	8.40	8.53	8.53	8.40	8.63	8.46	8.53	8.63	8.49	8.46
Total Loads	2076.82	1560.69	1577.31	1560.52	1727.06	1730.38	1571.54	1869.07	1564.20	1722.78	1872.10	1658.17	1582.85

Table RE1
Tri+ PCB Load Over Thompson Island Dam

	Two Step Upstream Boundary Assumption (0.16 kg/day>0.0256 kg/day)											
Year	r13s2 (3/10/Hot Spots 36 & 37)	r14 (REM-3/10/S + Channel)	r14sn0 (REM-3/10/S + channel, assumes residual of 0 ppm)	r14sn2 (REM-3/10/S + channel, assumes max residual of 2 ppm)	r14sn5 (REM-3/10/S + channel, assumes max residual of 5 ppm)	r15a (CAP-3/10/Select Areas, assumes 10% deffective cap)	r15sn15 (CAP 3/10/S + channel, assumes 15% deffective cap)	r15sn25 (CAP-3/10/S + channel, assumes 25% deffective cap)	r16 (REM-0/0/3 + channel)	r17 (CAP-0/10/36-37)	r18 (CAP-0/10/mna)	r19 (CAP-0/mna/mna)
1998	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82
1999	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34
2000	123.43	123.65	123.65	123.65	123.65	123.65	123.65	123.65	123.65	123.65	123.65	123.65
2001	135.08	135.20	135.20	135.20	135.20	135.20	135.20	135.20	135.20	135.20	135.20	135.20
2002	106.04	105.88	105.88	105.88	105.88	105.88	105.88	105.88	105.88	105.88	105.88	105.88
2003	103.50	103.71	103.71	103.71	103.71	103.71	103.71	103.71	103.71	103.71	103.71	103.71
2004	88.48	88.22	87.93	89.19	90.68	88.28	88.51	88.73	87.99	88.64	88.64	88.44
2005	40.41	40.56	39.41	44.38	50.29	40.86	41.73	42.54	38.31	41.62	41.62	40.85
2006	32.86	34.68	32.42	42.14	53.20	35.37	36.95	38.43	27.13	35.51	35.43	33.89
2007	28.70	27.24	24.47	36.71	49.74	28.11	29.94	32.03	17.48	26.36	25.69	24.04
2008	21.14	20.24	18.42	26.24	34.28	20.81	22.00	23.18	12.68	15.21	14.51	13.95
2009	20.84	19.90	18.15	25.73	33.62	20.45	21.61	22.81	12.63	13.94	13.91	13.87
2010	26.83	25.60	23.21	33.60	44.73	26.29	27.88	29.70	15.15	16.92	16.88	16.83
2011	23.37	22.31	20.34	28.97	38.26	22.91	24.22	25.84	13.77	15.30	15.26	15.22
2012	22.04	21.14	19.36	27.04	35.29	21.67	22.84	24.37	13.38	14.76	14.73	14.69
2013	22.04	21.10	19.38	26.77	34.73	21.59	22.74	24.28	13.41	14.75	14.72	14.68
2014	19.11	18.36	17.02	22.76	28.89	18.74	19.64	20.72	12.34	13.36	13.33	13.31
2015	18.28	17.60	16.38	21.61	27.22	17.95	18.77	19.75	12.05	12.98	12.96	12.93
2016	15.06	14.87	13.94	17.91	22.11	15.14	15.77	16.43	10.73	11.42	11.40	11.38
2017	14.87	14.10	13.29	16.74	20.41	14.33	14.88	15.45	10.48	11.08	11.07	11.05
2018	15.81	15.28	14.34	18.37	22.77	15.55	16.18	17.05	11.01	11.77	11.75	11.73
2019	13.59	13.16	12.46	15.46	18.68	13.36	13.84	14.37	9.95	10.48	10.47	10.45
2020	14.61	14.24	13.49	16.68	20.14	14.44	14.95	15.53	10.69	11.25	11.24	11.22
2021	13.65	13.47	12.80	15.67	18.80	13.65	14.11	14.66	10.28	10.79	10.78	10.77
2022	12.35	12.05	11.53	13.74	16.13	12.19	12.55	12.93	9.60	9.99	9.98	9.97
2023	12.05	11.59	11.13	13.08	15.20	11.71	12.03	12.36	9.41	9.76	9.75	9.74
2024	13.82	13.52	12.91	15.53	18.45	13.68	14.10	14.67	10.54	11.01	11.00	10.99
2025	12.21	11.95	11.49	13.44	15.59	12.07	12.39	12.75	9.71	10.05	10.05	10.04
2026	12.07	11.96	11.52	13.40	15.49	12.07	12.38	12.76	9.77	10.11	10.10	10.09
2027	11.41	11.06	10.70	12.21	13.87	11.15	11.40	11.70	9.30	9.57	9.57	9.56
2028	11.69	11.51	11.14	12.71	14.46	11.60	11.86	12.21	9.64	9.93	9.92	9.92
2029	11.46	11.34	11.00	12.44	14.05	11.42	11.66	11.98	9.60	9.87	9.86	9.86
2030	11.56	11.34	11.03	12.35	13.84	11.41	11.64	11.92	9.72	9.96	9.96	9.95
2031	11.78	11.57	11.23	12.68	14.34	11.65	11.89	12.32	9.79	10.08	10.08	10.07
2032	11.00	10.90	10.62	11.79	13.12	10.97	11.16	11.47	9.46	9.69	9.69	9.68
2033	10.59	10.44	10.20	11.21	12.35	10.50	10.67	10.91	9.20	9.39	9.38	9.38
2034	10.93	10.83	10.60	11.59	12.71	10.89	11.05	11.28	9.57	9.76	9.75	9.75
2035	10.88	10.74	10.51	11.48	12.60	10.79	10.95	11.18	9.49	9.67	9.67	9.66
2036	10.78	10.68	10.46	11.38	12.45	10.73	10.89	11.18	9.49	9.69	9.69	9.68
2037	10.62	10.49	10.28	11.13	12.10	10.53	10.68	11.09	9.39	9.61	9.61	9.61
2038	9.98	9.91	9.75	10.41	11.16	9.94	10.05	10.30	9.03	9.18	9.18	9.18
2039	10.91	10.83	10.63	11.43	12.36	10.87	11.00	11.48	9.75	9.98	9.98	9.98
2040	9.69	9.70	9.56	10.11	10.75	9.73	9.82	10.07	8.96	9.10	9.10	9.10
2041	9.99	9.89	9.76	10.28	10.87	9.91	10.00	10.17	9.19	9.30	9.29	9.29
2042	8.94	8.86	8.77	9.15	9.59	8.88	8.95	9.05	8.35	8.42	8.42	8.42
2043	10.65	10.59	10.44	11.03	11.72	10.61	10.72	11.03	9.76	9.92	9.92	9.91
2044	10.29	10.24	10.11	10.63	11.23	10.26	10.35	10.66	9.52	9.66	9.66	9.66
2045	9.79	9.72	9.61	10.05	10.58	9.74	9.82	10.10	9.09	9.22	9.22	9.22
2046	9.53	9.49	9.40	9.75	10.17	9.50	9.56	9.69	8.97	9.05	9.05	9.05
2047	9.36	9.32	9.24	9.56	9.95	9.33	9.39	9.54	8.85	8.93	8.92	8.92
2048	9.40	9.37	9.29	9.59	9.95	9.39	9.44	9.66	8.91	9.01	9.01	9.00
2049	8.96	8.95	8.88	9.13	9.43	8.96	9.01	9.17	8.57	8.64	8.64	8.64
2050	9.60	9.57	9.49	9.79	10.14	9.59	9.64	9.86	9.11	9.20	9.20	9.20
2051	9.74	9.71	9.63	9.90	10.22	9.72	9.77	9.96	9.29	9.37	9.37	9.37
2052	8.98	8.95	8.90	9.10	9.34	8.96	9.00	9.11	8.63	8.69	8.69	8.68
2053	8.79	8.77	8.72	8.91	9.12	8.78	8.81	8.91	8.49	8.53	8.53	8.53
2054	8.77	8.77	8.72	8.89	9.09	8.77	8.81	8.89	8.50	8.54	8.54	8.54
2055	9.36	9.36	9.30	9.50	9.74	9.37	9.40	9.52	9.03	9.08	9.08	9.08
2056	8.41	8.42	8.39	8.51	8.66	8.42	8.45	8.49	8.23	8.25	8.25	8.25
2057	8.96	9.08	9.05	9.19	9.35	9.09	9.12	9.17	8.86	8.89	8.89	8.89
2058	8.90	8.75	8.71	8.85	9.01	8.75	8.78	8.83	8.53	8.56	8.56	8.56
2059	8.75	8.73	8.70	8.82	8.96	8.73	8.76	8.80	8.54	8.56	8.56	8.56
2060	9.45	9.43	9.39	9.53	9.70	9.44	9.46	9.53	9.20	9.24	9.24	9.23
2061	9.75	9.76	9.72	9.86	10.04	9.76	9.79	9.86	9.51	9.54	9.54	9.54
2062	8.65	8.64	8.62	8.72	8.83	8.65	8.67	8.70	8.50	8.53	8.51	8.51
2063	8.64	8.60	8.58	8.67	8.77	8.60	8.62	8.65	8.51	8.55	8.47	8.47
2064	8.56	8.68	8.66	8.74	8.84	8.68	8.70	8.73	8.60	8.64	8.55	8.55
2065	9.11	8.99	8.97	9.06	9.15	9.00	9.01	9.04	8.90	8.93	8.87	8.87
2066	8.74	8.73	8.71	8.78	8.87	8.73	8.74	8.77	8.64	8.67	8.61	8.61
2067	8.53	8.17	8.16	8.22	8.30	8.18	8.19	8.21	8.11	8.14	8.08	8.07
Total Loads	1718.29	1704.64	1671.62	1812.84	1967.09	1713.81	1736.28	1765.13	1561.85	1605.17	1602.95	1597.75

Table RE1
Tri+ PCB Load Over Thompson Island Dam

Year	Constant Upstream Boundary Assumption (0.16 kg/day)							
	P3NAcw (No Action)	r01cw (0/0/3)	r02cw (0/10/mna)	r03cw (0/mna/mna)	r04cw (3/10/10)	r05cw (3/mna/mna)	r06cw (0/10/10)	r07cw (10/mna/mna)
1998	224.82	224.82	224.82	224.82	224.82	224.82	224.82	224.82
1999	109.34	109.34	109.34	109.34	109.34	109.34	109.34	109.34
2000	123.43	123.43	123.43	123.43	123.43	123.43	123.43	123.43
2001	135.08	135.08	135.08	135.08	135.08	135.08	135.08	135.08
2002	106.04	106.04	106.04	106.04	106.04	106.04	106.04	106.04
2003	103.50	103.50	103.50	103.50	103.50	103.50	103.50	103.50
2004	90.99	88.01	88.50	88.01	88.70	88.98	88.30	89.25
2005	93.07	80.19	82.48	80.19	83.35	84.61	81.69	85.66
2006	99.72	70.48	76.48	70.48	78.58	80.05	74.86	84.73
2007	98.93	59.36	65.80	59.36	71.13	71.14	64.01	83.01
2008	78.73	53.09	53.66	53.08	62.03	62.05	53.04	69.81
2009	79.26	54.04	54.03	54.03	62.66	62.67	54.00	70.19
2010	96.12	60.22	60.19	60.21	72.47	72.48	60.16	83.03
2011	87.84	57.64	57.61	57.63	67.69	67.70	57.59	76.40
2012	85.25	57.89	57.87	57.88	67.00	67.01	57.84	74.90
2013	85.98	58.77	58.76	58.77	67.82	67.83	58.73	75.61
2014	78.44	57.41	57.40	57.40	64.50	64.51	57.38	70.60
2015	76.47	57.25	57.24	57.24	63.78	63.79	57.22	69.39
2016	66.38	52.99	52.98	52.98	57.70	57.71	52.97	61.77
2017	66.72	53.95	53.95	53.94	58.42	58.43	53.93	62.27
2018	70.59	55.08	55.07	55.07	60.06	60.07	55.06	64.37
2019	62.91	51.99	51.99	51.97	55.76	55.77	51.98	59.00
2020	67.32	55.50	55.49	55.49	59.64	59.64	55.48	63.12
2021	64.49	54.11	54.10	54.10	57.71	57.72	54.10	60.75
2022	60.43	52.37	52.37	52.36	55.24	55.25	52.36	57.67
2023	59.84	52.40	52.40	52.39	55.06	55.07	52.39	57.30
2024	66.97	56.59	56.59	56.59	60.04	60.05	56.58	62.93
2025	61.31	53.91	53.91	53.91	56.52	56.53	53.90	58.70
2026	61.36	54.22	54.22	54.22	56.70	56.70	54.21	58.75
2027	59.20	53.25	53.25	53.24	55.37	55.37	53.24	57.13
2028	60.80	54.58	54.58	54.57	56.75	56.76	54.57	58.54
2029	60.26	54.53	54.53	54.53	56.54	56.55	54.53	58.19
2030	61.52	56.25	56.25	56.25	58.14	58.14	56.25	59.68
2031	62.41	56.07	56.07	56.07	58.13	58.14	56.07	59.82
2032	59.61	54.70	54.70	54.69	56.36	56.36	54.69	57.71
2033	58.15	53.99	53.99	53.99	55.43	55.44	53.99	56.60
2034	60.10	56.06	56.06	56.06	57.52	57.52	56.06	58.68
2035	59.97	55.93	55.93	55.93	57.37	57.37	55.92	58.52
2036	60.03	55.83	55.82	55.82	57.19	57.20	55.82	58.30
2037	60.12	55.72	55.72	55.72	56.98	56.99	55.72	58.02
2038	57.06	53.97	53.97	53.96	54.98	54.98	53.97	55.79
2039	62.34	57.84	57.84	57.83	59.07	59.07	57.83	60.08
2040	56.29	53.52	53.52	53.52	54.37	54.37	53.52	55.05
2041	58.02	55.68	55.68	55.68	56.49	56.50	55.68	57.14
2042	52.57	50.94	50.94	50.93	51.53	51.54	50.94	52.00
2043	61.92	58.70	58.70	58.69	59.65	59.65	58.70	60.40
2044	60.29	57.36	57.36	57.35	58.20	58.20	57.36	58.86
2045	57.69	55.11	55.11	55.11	55.84	55.85	55.11	56.42
2046	56.38	54.70	54.70	54.70	55.29	55.30	54.70	55.75
2047	55.74	53.91	53.91	53.91	54.45	54.46	53.91	54.88
2048	56.86	53.94	53.94	53.94	54.45	54.45	53.94	54.87
2049	54.31	52.02	52.02	52.01	52.44	52.44	52.02	52.79
2050	58.16	55.10	55.10	55.10	55.61	55.61	55.10	56.03
2051	59.14	56.44	56.44	56.44	56.90	56.91	56.44	57.28
2052	54.60	52.90	52.90	52.89	53.25	53.25	52.90	53.53
2053	53.57	52.05	52.05	52.04	52.36	52.37	52.05	52.62
2054	53.49	52.09	52.10	52.09	52.39	52.40	52.09	52.63
2055	56.99	55.19	55.19	55.18	55.55	55.55	55.19	55.83
2056	51.42	50.70	50.70	50.69	50.91	50.92	50.70	51.08
2057	54.78	53.91	53.91	53.90	54.14	54.15	53.91	54.32
2058	54.29	53.38	53.38	53.37	53.64	53.65	53.38	53.84
2059	53.62	52.80	52.80	52.79	53.02	53.02	52.80	53.18
2060	57.88	56.76	56.76	56.75	57.01	57.01	56.76	57.21
2061	59.63	58.48	58.48	58.47	58.75	58.75	58.48	58.96
2062	53.15	52.54	52.54	52.53	52.71	52.72	52.54	52.85
2063	53.15	52.58	52.58	52.57	52.74	52.75	52.58	52.87
2064	52.67	52.12	52.11	52.11	52.27	52.28	52.11	52.39
2065	56.05	55.57	55.56	55.56	55.72	55.73	55.56	55.84
2066	53.82	53.36	53.36	53.35	53.50	53.51	53.36	53.61
2067	52.65	52.21	52.21	52.20	52.34	52.34	52.21	52.44
Total Loads	4902.04	4382.47	4398.05	4382.02	4550.14	4553.54	4392.71	4693.15

Table RE2
Tri+ PCB Load Over Northumberland Dam

	Two Step Upstream Boundary Assumption (0.16 kg/day>0.0256 kg/day)												
Year	P3NAs2 (No Action)	r01s2 (0/0/3)	r02s2 (0/10/mna)	r03s2 (0/mna/mna)	r04s2 (3/10/10)	r05s2 (3/mna/mna)	r06s2 (0/10/10)	r07s2 (10/mna/mna)	r08s2 (0/0/3)	r09s2 (3/10/10)	r10s2 (10/mna/mna)	r11s2 (3 plus channel/10/ Hot Spots 36 & 37)	r12s2 (0/10/Hot Spots 36 & 37)
1998	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41
1999	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60
2000	151.91	151.91	151.91	151.91	151.91	151.91	151.91	151.91	151.91	151.91	151.91	151.91	151.83
2001	180.36	180.36	180.36	180.36	180.36	180.36	180.36	180.36	180.36	180.36	180.36	180.36	180.14
2002	122.72	122.72	122.72	122.72	122.72	122.72	122.72	122.72	122.72	122.72	122.72	122.72	122.98
2003	122.88	122.88	122.88	122.88	122.88	122.88	122.88	122.88	122.88	122.88	122.88	122.88	122.41
2004	98.74	96.04	96.48	96.04	96.67	96.91	96.31	97.15	96.16	96.56	97.15	96.56	97.06
2005	67.44	55.82	57.89	55.82	58.67	59.82	57.17	60.77	56.20	58.39	60.77	58.36	58.21
2006	77.81	50.90	56.40	50.90	56.93	59.75	54.92	63.98	51.27	56.62	63.99	57.04	56.64
2007	84.47	46.61	53.98	47.93	46.79	58.78	52.32	69.59	46.65	46.36	69.68	49.96	54.85
2008	45.07	20.52	20.65	22.48	23.94	30.35	20.10	37.15	20.49	23.61	37.14	20.17	21.25
2009	45.75	18.80	16.00	23.13	23.56	30.83	15.93	37.54	18.78	23.25	37.55	19.88	16.08
2010	73.65	19.01	21.55	39.15	33.12	50.89	21.46	60.95	19.08	32.76	61.05	27.82	21.77
2011	63.00	16.71	18.89	34.00	28.36	43.61	18.81	51.91	16.75	28.06	52.03	23.98	19.06
2012	54.07	15.61	17.22	27.82	25.82	36.55	17.16	44.07	15.65	25.54	44.19	21.82	17.36
2013	55.09	15.59	17.27	28.52	25.97	37.34	17.20	44.91	15.67	25.73	45.07	21.98	17.45
2014	41.09	13.60	14.61	20.75	21.36	27.61	14.56	33.48	13.68	21.19	33.57	18.24	14.75
2015	38.43	13.13	14.06	19.76	20.31	26.10	14.01	31.52	13.20	20.15	31.61	17.42	14.19
2016	28.08	11.01	11.62	15.11	16.09	19.63	11.59	23.53	11.04	15.95	23.57	13.95	11.67
2017	25.36	10.69	11.21	14.02	15.15	18.02	11.18	21.46	10.71	15.03	21.49	13.26	11.28
2018	34.57	11.77	12.77	19.39	17.58	24.26	12.74	28.46	11.83	17.49	28.58	15.37	12.90
2019	23.94	10.08	10.60	13.65	14.11	17.20	10.58	20.24	10.11	14.02	20.28	12.45	10.67
2020	26.53	11.04	11.59	14.89	15.61	18.96	11.57	22.39	11.09	15.53	22.45	13.77	11.68
2021	24.89	10.55	11.07	14.30	14.69	17.95	11.05	21.03	10.61	14.62	21.09	13.04	11.15
2022	19.32	9.52	9.84	11.62	12.56	14.37	9.82	16.69	9.55	12.49	16.72	11.30	9.89
2023	17.68	9.23	9.49	10.91	11.90	13.35	9.47	15.40	9.25	11.84	15.43	10.78	9.54
2024	25.64	11.04	11.56	15.05	15.06	18.58	11.54	21.53	11.11	15.01	21.61	13.53	11.68
2025	19.26	9.67	9.98	11.92	12.54	14.50	9.96	16.65	9.71	12.49	16.69	11.40	10.04
2026	19.69	9.85	10.18	12.29	12.72	14.86	10.16	16.99	9.90	12.68	17.04	11.61	10.25
2027	16.06	9.01	9.22	10.43	11.20	12.43	9.20	14.09	9.05	11.15	14.13	10.32	9.28
2028	17.56	9.56	9.79	11.28	11.97	13.48	9.78	15.29	9.61	11.93	15.34	11.03	9.86
2029	16.95	9.53	9.74	11.13	11.77	13.18	9.73	14.86	9.57	11.74	14.90	10.90	9.80
2030	16.08	9.49	9.67	10.82	11.54	12.70	9.66	14.24	9.54	11.51	14.28	10.74	9.74
2031	18.89	10.05	10.33	12.27	12.48	14.44	10.32	16.21	10.11	12.46	16.30	11.59	10.40
2032	15.91	9.43	9.61	10.83	11.32	12.55	9.60	13.95	9.47	11.29	14.01	10.61	9.67
2033	14.38	9.04	9.19	10.12	10.65	11.60	9.18	12.80	9.08	10.63	12.84	10.04	9.24
2034	14.64	9.54	9.66	10.46	11.16	11.97	9.66	13.17	9.58	11.13	13.21	10.54	9.71
2035	14.55	9.43	9.55	10.36	11.03	11.85	9.55	13.04	9.47	11.02	13.08	10.43	9.61
2036	14.89	9.52	9.65	10.53	11.07	11.96	9.65	13.12	9.56	11.06	13.18	10.50	9.71
2037	14.78	9.38	9.49	10.26	10.80	11.58	9.49	12.66	9.42	10.79	12.77	10.28	9.54
2038	12.36	8.73	8.80	9.23	9.82	10.26	8.80	11.08	8.76	9.80	11.14	9.41	8.84
2039	15.59	9.97	10.08	10.88	11.40	12.21	10.08	13.29	10.01	11.39	13.42	10.88	10.14
2040	12.02	8.71	8.77	9.18	9.64	10.06	8.77	10.77	8.74	9.63	10.83	9.30	8.80
2041	11.47	8.79	8.83	9.12	9.65	9.94	8.83	10.58	8.81	9.63	10.62	9.32	8.87
2042	9.58	7.77	7.80	7.99	8.38	8.57	7.80	9.03	7.79	8.37	9.05	8.15	7.82
2043	14.08	9.99	10.08	10.65	11.10	11.69	10.07	12.51	10.03	11.09	12.59	10.71	10.12
2044	13.27	9.62	9.69	10.17	10.59	11.08	9.68	11.80	9.65	10.57	11.88	10.24	9.73
2045	12.24	9.08	9.14	9.54	9.91	10.32	9.13	10.94	9.11	9.90	11.02	9.62	9.17
2046	10.81	8.79	8.83	9.06	9.44	9.68	8.82	10.15	8.81	9.43	10.18	9.21	8.85
2047	10.80	8.61	8.65	8.90	9.22	9.48	8.64	9.92	8.64	9.21	9.96	9.01	8.68
2048	11.81	8.63	8.66	8.90	9.19	9.43	8.66	9.88	8.70	9.25	9.94	9.05	8.73
2049	10.72	8.21	8.24	8.44	8.68	8.88	8.24	9.24	8.27	8.73	9.29	8.56	8.31
2050	12.50	9.05	9.09	9.38	9.64	9.93	9.09	10.39	9.14	9.71	10.46	9.51	9.18
2051	12.14	9.14	9.17	9.40	9.66	9.90	9.17	10.30	9.21	9.72	10.36	9.54	9.25
2052	10.21	8.30	8.32	8.48	8.69	8.85	8.32	9.15	8.34	8.72	9.18	8.58	8.36
2053	9.86	8.14	8.16	8.31	8.49	8.64	8.16	8.91	8.18	8.52	8.93	8.40	8.20
2054	9.76	8.17	8.19	8.33	8.50	8.65	8.19	8.90	8.21	8.53	8.92	8.41	8.24
2055	11.14	9.02	9.04	9.25	9.44	9.65	9.04	9.96	9.07	9.47	10.00	9.33	9.09
2056	8.43	7.63	7.64	7.71	7.86	7.93	7.64	8.09	7.65	7.86	8.10	7.79	7.65
2057	9.64	8.55	8.57	8.67	8.83	8.94	8.57	9.14	8.58	8.84	9.15	8.75	8.59
2058	9.05	8.11	8.12	8.20	8.37	8.45	8.12	8.64	8.13	8.38	8.65	8.29	8.15
2059	9.15	8.19	8.20	8.30	8.43	8.53	8.20	8.70	8.21	8.44	8.71	8.36	8.23
2060	10.46	9.12	9.14	9.27	9.42	9.56	9.14	9.77	9.15	9.44	9.79	9.34	9.17
2061	11.08	9.66	9.68	9.84	9.98	10.14	9.68	10.38	9.69	10.00	10.39	9.90	9.71
2062	8.83	8.11	8.12	8.19	8.30	8.38	8.12	8.52	8.14	8.31	8.52	8.25	8.15
2063	8.73	8.09	8.08	8.14	8.25	8.32	8.08	8.45	8.14	8.26	8.45	8.20	8.15
2064	8.92	8.27	8.26	8.33	8.43	8.50	8.26	8.63	8.33	8.43	8.63	8.38	8.33
2065	8.99	8.45	8.44	8.49	8.60	8.66	8.44	8.78	8.48	8.60	8.78	8.55	8.50
2066	8.81	8.29	8.28	8.33	8.43	8.49	8.28	8.60	8.33	8.44	8.60	8.39	8.33
2067	8.31	7.81	7.80	7.86	7.94	8.00	7.80	8.10	7.86	7.94	8.10	7.90	7.88
Total Loads	2483.93	1838.63	1869.55	1983.36	1997.67	2147.94	1864.10	2282.31	1842.02	1993.57	2285.29	1938.89	1875.56

Table RE2
Tri+ PCB Load Over Northumberland Dam

Year	Two Step Upstream Boundary Assumption (0.16 kg/day>0.0256 kg/day)											
	r13s2 (3/10/Hot Spots 36 & 37)	r14 (REM-3/10/S + Channel)	r14sn0 (REM-3/10/S + channel, assumes residual of 0 ppm)	r14sn2 (REM-3/10/S + channel, assumes max residual of 2 ppm)	r14sn5 (REM-3/10/S + channel, assumes max residual of 5 ppm)	r15a (CAP-3/10/Select Areas, assumes 10% deffective cap)	r15sn15 (CAP-3/10/S + channel, assumes 15% deffective cap)	r15sn25 (CAP-3/10/S + channel, assumes 25% deffective cap)	r16 (REM-0/0/3 + channel)	r17 (CAP-0/10/36-37)	r18 (CAP-0/10/mna)	r19 (CAP-0/mna/mna)
1998	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41
1999	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60
2000	151.91	151.91	151.91	151.91	151.91	151.91	151.91	151.91	151.91	151.91	151.91	151.91
2001	180.36	180.36	180.36	180.36	180.36	180.36	180.36	180.36	180.36	180.36	180.36	180.36
2002	122.72	122.72	122.72	122.72	122.72	122.72	122.72	122.72	122.72	122.72	122.72	122.72
2003	122.88	122.88	122.88	122.88	122.88	122.88	122.88	122.88	122.88	122.88	122.88	122.88
2004	96.47	96.24	95.99	97.10	98.41	96.29	96.50	96.69	96.04	96.62	96.62	96.44
2005	57.14	57.51	56.47	60.95	66.28	57.78	58.56	59.29	55.48	58.46	58.46	57.77
2006	51.40	57.01	54.93	63.87	74.07	57.64	59.10	60.46	50.06	57.77	57.70	56.29
2007	35.90	51.14	48.34	61.34	75.38	52.43	54.31	56.63	46.65	56.29	55.68	54.14
2008	23.64	22.75	20.87	29.60	38.66	23.78	25.04	26.47	20.53	22.45	21.84	23.63
2009	23.28	22.44	20.59	29.33	38.60	23.54	24.80	26.34	18.86	17.57	17.54	24.28
2010	32.87	31.78	28.93	43.04	58.87	33.90	35.95	38.80	19.27	24.44	24.39	40.92
2011	28.15	27.24	24.89	36.58	49.79	29.07	30.78	33.28	16.91	21.34	21.30	35.51
2012	25.60	24.72	22.70	32.42	43.25	26.12	27.56	29.70	15.77	19.22	19.18	29.18
2013	25.79	24.92	22.91	32.52	43.32	26.34	27.79	30.01	15.78	19.32	19.29	29.89
2014	21.21	20.50	19.01	25.88	33.44	21.39	22.44	23.88	13.75	16.01	15.98	21.79
2015	20.18	19.51	18.15	24.43	31.35	20.33	21.30	22.62	13.26	15.34	15.32	20.71
2016	15.96	15.46	14.49	18.88	23.65	16.01	16.69	17.53	11.08	12.47	12.46	15.76
2017	15.04	14.59	13.74	17.56	21.69	15.05	15.65	16.36	10.75	11.94	11.92	14.59
2018	17.52	17.03	15.95	21.13	27.04	17.86	18.67	19.94	11.89	13.95	13.93	20.17
2019	14.04	13.67	12.92	16.36	20.16	14.12	14.66	15.36	10.14	11.31	11.30	14.17
2020	15.54	15.15	14.33	18.12	22.36	15.63	16.23	17.01	11.13	12.41	12.39	15.49
2021	14.63	14.29	13.54	17.00	20.89	14.74	15.29	16.03	10.64	11.84	11.82	14.84
2022	12.50	12.23	11.68	14.16	16.92	12.51	12.91	13.39	9.57	10.35	10.34	12.01
2023	11.84	11.60	11.12	13.28	15.67	11.84	12.19	12.60	9.27	9.93	9.92	11.26
2024	15.03	14.71	14.00	17.34	21.19	15.17	15.71	16.50	11.14	12.34	12.33	15.60
2025	12.50	12.26	11.75	14.06	16.68	12.54	12.91	13.40	9.73	10.48	10.47	12.30
2026	12.69	12.46	11.95	14.26	16.91	12.75	13.12	13.65	9.92	10.70	10.69	12.68
2027	11.16	10.97	10.59	12.30	14.22	11.16	11.44	11.81	9.06	9.59	9.58	10.72
2028	11.94	11.73	11.32	13.19	15.33	11.95	12.26	12.71	9.62	10.22	10.21	11.61
2029	11.74	11.55	11.17	12.90	14.88	11.76	12.04	12.45	9.58	10.13	10.13	11.44
2030	11.51	11.34	10.99	12.54	14.32	11.51	11.77	12.13	9.55	10.02	10.02	11.10
2031	12.47	12.28	11.87	13.76	15.97	12.53	12.84	13.40	10.13	10.81	10.80	12.63
2032	11.30	11.15	10.83	12.27	13.94	11.32	11.56	11.95	9.48	9.96	9.96	11.11
2033	10.63	10.50	10.24	11.45	12.85	10.64	10.84	11.15	9.09	9.47	9.47	10.35
2034	11.14	11.01	10.74	11.92	13.29	11.13	11.33	11.61	9.58	9.94	9.93	10.69
2035	11.02	10.89	10.63	11.79	13.15	11.01	11.21	11.50	9.48	9.83	9.83	10.59
2036	11.06	10.94	10.69	11.83	13.16	11.07	11.26	11.62	9.57	9.95	9.95	10.78
2037	10.79	10.69	10.45	11.48	12.70	10.80	10.97	11.44	9.43	9.81	9.80	10.53
2038	9.81	9.72	9.55	10.31	11.19	9.79	9.92	10.19	8.77	9.01	9.01	9.41
2039	11.39	11.28	11.05	12.06	13.26	11.40	11.57	12.10	10.02	10.41	10.41	11.16
2040	9.63	9.56	9.41	10.06	10.82	9.62	9.73	10.01	8.74	8.96	8.96	9.35
2041	9.63	9.57	9.43	10.01	10.68	9.62	9.72	9.90	8.81	8.98	8.98	9.25
2042	8.37	8.32	8.22	8.64	9.12	8.36	8.43	8.54	7.79	7.90	7.90	8.08
2043	11.09	11.01	10.84	11.59	12.49	11.09	11.22	11.59	10.04	10.32	10.31	10.86
2044	10.58	10.51	10.35	11.00	11.78	10.57	10.68	11.03	9.66	9.90	9.90	10.36
2045	9.90	9.84	9.71	10.27	10.93	9.90	9.99	10.30	9.11	9.32	9.32	9.70
2046	9.43	9.38	9.29	9.70	10.20	9.42	9.49	9.64	8.82	8.94	8.94	9.16
2047	9.22	9.17	9.08	9.47	9.95	9.21	9.28	9.45	8.64	8.77	8.77	9.01
2048	9.25	9.21	9.12	9.48	9.92	9.25	9.31	9.55	8.70	8.84	8.84	9.07
2049	8.73	8.70	8.62	8.92	9.28	8.73	8.78	8.95	8.27	8.38	8.38	8.57
2050	9.71	9.68	9.58	9.96	10.41	9.72	9.78	10.03	9.14	9.29	9.28	9.56
2051	9.72	9.69	9.61	9.94	10.34	9.73	9.78	9.99	9.21	9.34	9.34	9.56
2052	8.72	8.70	8.63	8.88	9.18	8.72	8.76	8.89	8.34	8.43	8.43	8.58
2053	8.52	8.50	8.44	8.66	8.93	8.52	8.56	8.67	8.18	8.26	8.26	8.40
2054	8.53	8.51	8.46	8.66	8.91	8.53	8.56	8.67	8.21	8.28	8.28	8.41
2055	9.47	9.45	9.38	9.65	9.96	9.48	9.52	9.66	9.07	9.16	9.16	9.36
2056	7.86	7.85	7.81	7.95	8.12	7.86	7.88	7.93	7.65	7.68	7.68	7.75
2057	8.84	8.82	8.78	8.95	9.15	8.84	8.87	8.93	8.58	8.63	8.63	8.73
2058	8.38	8.36	8.33	8.48	8.67	8.38	8.41	8.46	8.13	8.17	8.17	8.25
2059	8.44	8.43	8.39	8.54	8.71	8.44	8.47	8.52	8.21	8.26	8.26	8.35
2060	9.44	9.42	9.38	9.55	9.77	9.44	9.47	9.55	9.15	9.21	9.21	9.34
2061	10.00	9.98	9.94	10.13	10.36	10.00	10.04	10.12	9.69	9.76	9.76	9.91
2062	8.31	8.30	8.27	8.38	8.52	8.31	8.33	8.37	8.14	8.18	8.16	8.23
2063	8.26	8.24	8.22	8.32	8.45	8.25	8.27	8.31	8.14	8.18	8.11	8.18
2064	8.43	8.42	8.40	8.50	8.62	8.43	8.45	8.49	8.33	8.38	8.30	8.37
2065	8.60	8.59	8.57	8.67	8.78	8.60	8.62	8.65	8.48	8.52	8.47	8.52
2066	8.44	8.43	8.40	8.49	8.60	8.43	8.45	8.48	8.33	8.36	8.31	8.36
2067	7.95	7.94	7.92	8.00	8.09	7.94	7.96	7.99	7.86	7.89	7.83	7.88
Total Loads	1977.22	1984.72	1948.84	2114.70	2300.46	2005.20	2030.87	2067.59	1841.24	1904.88	1902.79	2019.55

Table RE2
Tri+ PCB Load Over Northumberland Dam

Year	Constant Upstream Boundary Assumption (0.16 kg/day)							
	P3NAcw (No Action)	r01cw (0/0/3)	r02cw (0/10/mna)	r03cw (0/mna/mna)	r04cw (3/10/10)	r05cw (3/mna/mna)	r06cw (0/10/10)	r07cw (10/mna/mna)
1998	274.41	274.41	274.41	274.41	274.41	274.41	274.41	274.41
1999	126.60	126.60	126.60	126.60	126.60	126.60	126.60	126.60
2000	151.83	151.91	151.91	151.91	151.91	151.91	151.91	151.91
2001	180.14	180.36	180.36	180.36	180.36	180.36	180.36	180.36
2002	122.98	122.72	122.72	122.72	122.72	122.72	122.72	122.72
2003	122.41	122.88	122.88	122.88	122.88	122.88	122.88	122.88
2004	99.18	96.05	96.49	96.05	96.67	96.91	96.31	97.15
2005	104.70	93.12	95.18	93.12	95.97	97.11	94.46	98.06
2006	117.06	89.88	95.41	89.88	95.89	98.75	93.92	103.02
2007	123.60	85.46	92.96	86.90	85.48	97.81	91.30	108.74
2008	81.71	56.71	56.93	58.96	60.35	66.92	56.39	73.79
2009	83.37	55.69	52.90	60.50	60.84	68.29	52.87	75.07
2010	117.75	61.46	64.41	82.96	76.68	94.82	64.36	104.98
2011	105.32	57.75	60.23	76.11	70.26	85.82	60.19	94.19
2012	97.04	57.67	59.52	70.64	68.51	79.45	59.48	87.04
2013	99.41	59.01	60.89	72.65	69.99	81.56	60.85	89.19
2014	84.44	56.40	57.54	63.96	64.54	70.88	57.51	76.80
2015	82.00	56.22	57.26	63.21	63.73	69.61	57.24	75.08
2016	67.34	50.07	50.77	54.39	55.36	58.97	50.75	62.89
2017	65.55	50.54	51.12	54.05	55.18	58.09	51.11	61.55
2018	76.82	53.54	54.61	61.46	59.61	66.39	54.60	70.61
2019	63.03	48.91	49.48	52.64	53.09	56.23	49.47	59.29
2020	69.66	53.94	54.54	57.96	58.68	62.07	54.53	65.52
2021	67.07	52.54	53.09	56.44	56.81	60.13	53.08	63.22
2022	59.54	49.58	49.92	51.76	52.71	54.55	49.91	56.88
2023	57.70	49.08	49.36	50.84	51.82	53.30	49.35	55.36
2024	71.54	56.70	57.25	60.85	60.84	64.42	57.24	67.38
2025	61.48	51.77	52.10	54.10	54.72	56.71	52.09	58.88
2026	63.03	53.07	53.41	55.59	56.02	58.19	53.40	60.33
2027	57.11	49.90	50.11	51.37	52.14	53.39	50.11	55.05
2028	60.97	52.87	53.11	54.65	55.34	56.87	53.11	58.69
2029	60.71	53.24	53.46	54.90	55.53	56.96	53.46	58.65
2030	60.41	53.68	53.86	55.05	55.77	56.95	53.86	58.49
2031	65.11	56.19	56.47	58.47	58.68	60.66	56.47	62.44
2032	60.38	53.82	54.01	55.27	55.75	57.00	54.00	58.41
2033	57.61	52.21	52.36	53.32	53.85	54.81	52.36	56.02
2034	60.54	55.40	55.53	56.36	57.05	57.88	55.53	59.09
2035	60.02	54.82	54.95	55.78	56.45	57.29	54.94	58.48
2036	60.93	55.50	55.64	56.54	57.08	57.99	55.63	59.14
2037	60.42	54.97	55.09	55.88	56.42	57.21	55.08	58.29
2038	55.55	51.87	51.94	52.38	52.97	53.42	51.94	54.25
2039	64.40	58.73	58.85	59.67	60.18	61.00	58.84	62.09
2040	55.44	52.13	52.19	52.61	53.07	53.50	52.19	54.21
2041	55.60	52.86	52.90	53.20	53.73	54.03	52.90	54.67
2042	48.92	47.07	47.10	47.29	47.69	47.89	47.10	48.35
2043	63.96	59.83	59.91	60.51	60.95	61.55	59.91	62.37
2044	61.51	57.83	57.89	58.39	58.81	59.30	57.89	60.02
2045	57.97	54.77	54.82	55.24	55.61	56.03	54.82	56.65
2046	55.50	53.45	53.49	53.72	54.11	54.35	53.49	54.82
2047	54.58	52.37	52.41	52.67	52.99	53.25	52.41	53.70
2048	55.60	52.43	52.46	52.71	53.00	53.25	52.46	53.69
2049	52.68	50.13	50.15	50.35	50.60	50.80	50.15	51.16
2050	58.50	55.04	55.08	55.37	55.63	55.93	55.08	56.39
2051	58.78	55.76	55.80	56.03	56.29	56.53	55.80	56.93
2052	52.79	50.87	50.89	51.05	51.26	51.43	50.89	51.73
2053	51.72	49.99	50.01	50.16	50.34	50.50	50.01	50.76
2054	51.88	50.24	50.26	50.41	50.58	50.72	50.26	50.97
2055	57.40	55.30	55.32	55.54	55.72	55.94	55.32	56.25
2056	47.94	47.15	47.16	47.23	47.38	47.45	47.16	47.62
2057	53.88	52.80	52.82	52.92	53.08	53.19	52.82	53.39
2058	51.09	50.08	50.09	50.16	50.34	50.42	50.09	50.61
2059	51.60	50.63	50.64	50.74	50.87	50.97	50.64	51.14
2060	57.65	56.30	56.31	56.45	56.59	56.74	56.31	56.95
2061	61.01	59.59	59.61	59.77	59.92	60.08	59.61	60.31
2062	50.95	50.23	50.23	50.30	50.42	50.50	50.23	50.63
2063	50.67	50.00	50.00	50.07	50.18	50.25	50.00	50.38
2064	51.79	51.15	51.16	51.23	51.33	51.40	51.16	51.53
2065	52.90	52.31	52.31	52.37	52.48	52.54	52.31	52.65
2066	51.88	51.33	51.34	51.39	51.49	51.55	51.34	51.66
2067	49.04	48.41	48.41	48.46	48.55	48.60	48.41	48.70
Total Loads	5204.08	4547.24	4580.41	4699.88	4712.85	4865.98	4575.37	5001.23

Table RE3
Tri+ PCB Load Over Federal Dam

Year	Two Step Upstream Boundary Assumption (0.16 kg/day>0.0256 kg/day)												
	P3NAs2 (No Action)	r01s2 (0/0/3)	r02s2 (0/10/mna)	r03s2 (0/mna/mna)	r04s2 (3/10/10)	r05s2 (3/mna/mna)	r06s2 (0/10/10)	r07s2 (10/mna/mna)	r08s2 (0/0/3)	r09s2 (3/10/10)	r10s2 (10/mna/mna)	r11s2 (3 plus channel/10/ Hot Spots 36 & 37)	r12s2 (0/10/Hot Spots 36 & 37)
1998	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29
1999	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67
2000	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50
2001	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73
2002	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85
2003	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51
2004	95.66	94.56	94.75	94.56	94.83	94.93	94.67	95.04	94.61	94.78	95.04	94.78	94.72
2005	92.33	86.27	87.33	86.27	87.75	88.37	86.95	88.87	86.48	87.60	88.87	87.61	87.46
2006	105.04	88.73	92.05	88.73	92.50	94.19	91.14	96.28	89.01	92.32	96.28	92.48	92.13
2007	103.76	78.57	83.84	79.41	77.33	86.49	82.71	93.24	78.65	77.06	93.24	80.99	84.36
2008	50.58	37.62	38.13	38.54	38.79	42.69	37.59	46.16	37.64	38.61	46.16	37.54	38.43
2009	46.87	32.01	30.74	34.15	33.56	38.40	30.16	42.03	32.02	33.39	42.03	31.73	30.69
2010	93.72	49.28	52.04	64.96	59.38	74.65	50.99	82.84	49.36	59.07	82.84	55.29	51.36
2011	71.76	33.65	36.35	48.24	42.61	55.95	35.71	62.52	33.70	42.36	62.52	39.28	35.96
2012	65.69	31.88	34.14	42.89	40.37	50.41	33.56	56.83	31.93	40.13	56.83	37.08	33.78
2013	67.45	31.79	34.09	43.78	40.97	51.64	33.66	58.34	31.87	40.74	58.34	37.36	33.75
2014	49.22	24.41	25.85	31.30	31.28	37.35	25.59	42.52	24.47	31.11	42.52	28.44	25.64
2015	45.07	21.85	23.14	28.28	28.34	33.99	22.93	38.85	21.91	28.18	38.85	25.67	22.99
2016	26.72	13.93	14.65	17.29	17.63	20.57	14.53	23.37	13.96	17.53	23.37	16.07	14.55
2017	24.65	13.10	13.73	15.93	16.55	19.01	13.62	21.64	13.12	16.45	21.64	15.07	13.64
2018	33.48	14.18	15.25	20.91	19.02	24.94	15.14	28.39	14.23	18.94	28.39	17.17	15.22
2019	22.19	11.16	11.75	14.22	14.31	16.98	11.66	19.32	11.19	14.23	19.32	13.01	11.70
2020	28.54	13.69	14.41	17.59	18.02	21.42	14.31	24.66	13.74	17.93	24.66	16.25	14.38
2021	26.06	12.43	13.08	16.22	16.30	19.61	13.00	22.48	12.47	16.23	22.48	14.74	13.07
2022	18.27	9.65	10.05	11.72	12.26	14.06	9.99	16.03	9.67	12.20	16.03	11.17	10.03
2023	16.65	9.08	9.42	10.81	11.41	12.91	9.37	14.69	9.10	11.36	14.69	10.44	9.40
2024	29.43	13.95	14.65	18.25	18.26	22.03	14.56	25.21	14.01	18.20	25.21	16.59	14.67
2025	19.57	10.07	10.48	12.50	12.87	14.99	10.42	17.07	10.10	12.81	17.07	11.75	10.49
2026	19.36	9.86	10.27	12.37	12.62	14.81	10.22	16.86	9.90	12.57	16.86	11.54	10.29
2027	14.99	8.40	8.68	9.91	10.42	11.73	8.63	13.26	8.43	10.38	13.26	9.61	8.68
2028	17.76	9.66	9.99	11.55	12.10	13.75	9.94	15.58	9.70	12.06	15.58	11.14	10.00
2029	17.24	9.62	9.92	11.39	11.92	13.47	9.87	15.20	9.65	11.88	15.20	11.02	9.93
2030	15.92	9.26	9.52	10.76	11.32	12.62	9.47	14.17	9.29	11.28	14.17	10.51	9.54
2031	18.57	9.93	10.27	12.19	12.34	14.32	10.23	16.08	9.98	12.31	16.08	11.44	10.31
2032	15.28	8.81	9.06	10.35	10.69	12.04	9.02	13.43	8.85	10.66	13.43	9.98	9.08
2033	13.31	8.04	8.24	9.24	9.62	10.67	8.20	11.84	8.07	9.59	11.84	9.02	8.26
2034	15.36	9.71	9.92	10.89	11.49	12.52	9.87	13.84	9.75	11.46	13.84	10.81	9.93
2035	23.52	18.12	18.43	19.48	20.03	20.92	18.39	22.22	18.16	20.01	22.22	19.26	18.40
2036	33.27	27.44	27.78	28.75	29.21	30.27	27.74	31.48	27.48	29.19	31.48	28.62	27.80
2037	29.50	23.83	24.13	24.97	25.43	26.36	24.08	27.48	23.87	25.41	27.48	24.89	24.14
2038	20.71	17.08	17.27	17.75	18.21	18.75	17.24	19.55	17.11	18.20	19.55	17.82	17.28
2039	27.07	21.23	21.50	22.35	22.83	23.76	21.46	24.90	21.28	22.81	24.90	22.29	21.52
2040	16.38	13.14	13.29	13.73	14.08	14.57	13.26	15.24	13.17	14.07	15.24	13.76	13.30
2041	15.01	12.34	13.42	13.74	14.14	14.44	13.39	15.12	12.36	14.12	15.12	13.85	12.48
2042	10.43	8.79	10.31	10.51	10.77	11.01	10.28	11.40	8.81	10.76	11.40	10.58	8.88
2043	19.45	15.19	17.22	17.83	18.26	18.94	17.18	19.80	15.23	18.24	19.80	17.84	15.38
2044	19.84	15.32	15.27	15.78	16.17	16.75	15.23	17.50	15.36	16.16	17.50	15.71	15.48
2045	15.60	12.54	12.10	12.50	12.79	13.24	12.07	13.82	12.57	12.78	13.82	12.35	12.66
2046	14.17	12.01	11.57	11.83	12.16	12.47	11.54	12.95	12.03	12.15	12.95	11.78	12.10
2047	11.96	9.93	9.63	9.89	10.13	10.43	9.60	10.85	9.95	10.13	10.85	9.83	10.01
2048	12.25	9.49	9.25	9.49	9.72	10.00	9.22	10.41	9.54	9.76	10.41	9.48	9.60
2049	10.37	8.25	8.08	8.27	8.45	8.67	8.05	8.99	8.29	8.48	8.99	8.26	8.34
2050	12.84	9.76	9.60	9.89	10.10	10.42	9.57	10.86	9.83	10.15	10.86	9.89	9.89
2051	13.43	10.49	10.35	10.60	10.83	11.13	10.31	11.55	10.56	10.88	11.55	10.62	10.62
2052	9.22	7.49	7.42	7.58	7.73	7.92	7.39	8.20	7.53	7.76	8.20	7.60	7.57
2053	8.51	7.01	6.96	7.11	7.24	7.41	6.94	7.64	7.04	7.26	7.64	7.12	7.08
2054	8.60	7.17	7.14	7.28	7.40	7.57	7.12	7.80	7.20	7.42	7.80	7.30	7.23
2055	10.69	8.70	8.69	8.89	9.04	9.28	8.66	9.59	8.74	9.07	9.59	8.91	8.79
2056	6.69	5.98	5.97	6.04	6.14	6.23	5.95	6.38	5.99	6.14	6.38	6.06	6.01
2057	9.01	7.92	7.93	8.04	8.16	8.31	7.90	8.51	7.95	8.18	8.51	8.07	7.98
2058	8.15	7.23	7.25	7.33	7.46	7.58	7.22	7.77	7.25	7.47	7.77	7.37	7.28
2059	8.13	7.21	7.23	7.33	7.43	7.55	7.20	7.72	7.23	7.44	7.72	7.35	7.26
2060	10.63	9.28	9.32	9.46	9.58	9.77	9.28	10.00	9.31	9.60	10.00	9.49	9.35
2061	11.41	10.00	10.05	10.21	10.34	10.54	10.01	10.79	10.03	10.35	10.79	10.24	10.08
2062	7.46	6.78	6.81	6.88	6.96	7.06	6.78	7.19	6.80	6.96	7.19	6.90	6.82
2063	7.27	6.67	6.69	6.76	6.83	6.92	6.66	7.04	6.71	6.83	7.04	6.78	6.73
2064	7.32	6.74	6.76	6.83	6.89	6.99	6.74	7.10	6.79	6.90	7.10	6.84	6.81
2065	7.56	7.06	7.09	7.14	7.21	7.30	7.06	7.41	7.09	7.21	7.41	7.16	7.11
2066	7.59	7.10	7.13	7.19	7.26	7.34	7.11	7.45	7.14	7.26	7.45	7.21	7.16
2067	6.74	6.32	6.34	6.39	6.44	6.51	6.32	6.60	6.35	6.44	6.60	6.40	6.37
Total Loads	2919.86	2377.28	2412.28	2511.56	2510.80	2646.46	2403.21	2756.47	2380.16	2507.59	2756.47	2461.78	2410.52

Table RE3
Tri+ PCB Load Over Federal Dam

Year	Two Step Upstream Boundary Assumption (0.16 kg/day>0.0256 kg/day)											
	r13s2 (3/10/Hot Spots 36 & 37)	r14 (REM-3/10/S + Channel)	r14sn0 (REM-3/10/S + channel, assumes residual of 0 ppm)	r14sn2 (REM-3/10/S + channel, assumes max residual of 2 ppm)	r14sn5 (REM-3/10/S + channel, assumes max residual of 5 ppm)	r15a (CAP-3/10/Select Areas, assumes 10% deffective cap)	r15sn15 (CAP-3/10/S + channel, assumes 15% deffective cap)	r15sn25 (CAP-3/10/S + channel, assumes 25% deffective cap)	r16 (REM-0/0/3 + channel)	r17 (CAP-0/10/36-37)	r18 (CAP-0/10/mna)	r19 (CAP-0/mna/mna)
1998	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29
1999	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67
2000	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50
2001	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73
2002	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85
2003	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51
2004	94.74	94.64	94.53	95.01	95.58	94.59	94.75	94.76	94.55	94.80	94.80	94.73
2005	86.99	87.13	86.58	88.94	91.75	87.26	87.68	88.07	86.10	87.63	87.63	87.26
2006	89.17	92.37	91.10	96.56	102.88	92.75	93.65	94.50	88.17	92.86	92.83	91.96
2007	68.04	81.37	79.49	88.16	97.71	82.22	83.48	85.08	78.54	85.30	84.97	83.91
2008	36.99	38.63	37.21	42.52	47.38	39.15	40.08	40.84	37.60	39.05	38.76	39.47
2009	32.14	32.88	31.04	37.46	42.83	33.51	34.83	35.72	32.04	31.46	31.59	35.03
2010	57.27	58.16	54.58	68.63	81.86	59.90	62.54	64.90	49.68	53.26	54.33	66.82
2011	41.30	41.65	39.01	50.03	60.98	43.17	45.15	47.22	33.93	37.66	38.31	49.69
2012	39.22	39.37	36.99	46.78	56.41	40.60	42.37	44.25	32.15	35.25	35.84	44.26
2013	39.94	39.61	37.29	47.13	57.19	40.93	42.61	44.59	31.86	35.31	35.89	45.16
2014	30.56	30.15	28.49	35.46	42.56	31.00	32.16	33.46	24.42	26.70	27.08	32.32
2015	27.76	27.32	25.82	32.19	38.79	28.11	29.16	30.37	21.88	23.99	24.29	29.22
2016	17.28	17.01	16.15	19.77	23.47	17.45	18.05	18.69	13.93	15.10	15.28	17.82
2017	16.24	15.97	15.19	18.48	21.86	16.35	16.90	17.47	13.10	14.14	14.29	16.41
2018	18.77	18.42	17.40	22.07	27.18	19.15	19.90	20.99	14.24	16.09	16.24	21.61
2019	14.10	13.86	13.19	16.12	19.23	14.24	14.72	15.28	11.18	12.20	12.30	14.66
2020	17.80	17.46	16.58	20.46	24.62	17.94	18.57	19.33	13.74	15.06	15.16	18.19
2021	16.12	15.83	15.05	18.52	22.31	16.28	16.84	17.55	12.48	13.70	13.79	16.75
2022	12.12	11.91	11.39	13.68	16.15	12.18	12.56	12.99	9.67	10.43	10.49	12.08
2023	11.29	11.10	10.64	12.67	14.85	11.33	11.67	12.04	9.10	9.75	9.80	11.12
2024	18.12	17.80	16.97	20.74	24.95	18.30	18.91	19.75	14.03	15.38	15.46	18.86
2025	12.77	12.55	12.02	14.40	17.05	12.85	13.23	13.72	10.11	10.92	10.97	12.88
2026	12.53	12.32	11.81	14.14	16.75	12.62	13.00	13.50	9.91	10.72	10.76	12.74
2027	10.34	10.18	9.81	11.48	13.33	10.38	10.65	11.00	8.43	8.98	9.02	10.19
2028	12.03	11.84	11.39	13.39	15.61	12.08	12.40	12.84	9.71	10.37	10.41	11.89
2029	11.86	11.68	11.26	13.13	15.22	11.90	12.20	12.62	9.66	10.28	10.31	11.71
2030	11.26	11.10	10.73	12.37	14.22	11.29	11.56	11.92	9.30	9.83	9.87	11.04
2031	12.29	12.11	11.69	13.63	15.87	12.37	12.69	13.23	10.00	10.70	10.73	12.54
2032	10.65	10.51	10.18	11.67	13.39	10.69	10.94	11.33	8.86	9.38	9.40	10.63
2033	9.58	9.46	9.19	10.43	11.85	9.61	9.81	10.12	8.08	8.50	8.52	9.47
2034	11.44	11.31	11.01	12.37	13.92	11.46	11.69	12.00	9.75	10.19	10.22	11.14
2035	20.00	19.59	19.28	20.66	22.15	19.75	19.97	20.27	17.57	18.64	18.71	19.72
2036	29.18	28.81	28.47	29.97	31.53	28.99	29.22	29.59	26.31	28.06	28.09	29.01
2037	25.40	25.09	24.78	26.12	27.51	25.25	25.46	25.90	22.91	24.41	24.44	25.24
2038	18.18	17.98	17.77	18.68	19.63	18.08	18.22	18.47	16.48	17.45	17.47	17.92
2039	22.80	22.55	22.25	23.53	24.89	22.70	22.90	23.40	20.56	21.80	21.83	22.64
2040	14.05	13.92	13.74	14.48	15.27	14.00	14.12	14.38	12.78	13.45	13.47	13.89
2041	14.11	14.00	13.85	14.50	15.20	14.07	14.17	14.35	12.04	12.60	13.57	13.87
2042	10.75	10.68	10.58	11.00	11.45	10.72	10.79	10.89	8.61	8.95	10.40	10.58
2043	18.23	18.10	17.89	18.79	19.80	18.20	18.34	18.70	14.94	15.58	17.47	18.04
2044	16.04	15.82	15.61	16.50	17.49	15.92	16.06	16.40	15.15	15.66	15.49	15.97
2045	12.61	12.34	12.15	12.94	13.80	12.43	12.55	12.83	12.24	12.79	12.27	12.65
2046	11.99	11.76	11.59	12.26	12.98	11.83	11.93	12.09	11.74	12.19	11.69	11.94
2047	10.01	9.84	9.71	10.25	10.85	9.90	9.98	10.15	9.75	10.09	9.74	9.99
2048	9.66	9.52	9.39	9.88	10.43	9.57	9.65	9.86	9.38	9.69	9.40	9.63
2049	8.40	8.30	8.20	8.58	9.01	8.34	8.40	8.55	8.17	8.41	8.20	8.38
2050	10.08	9.96	9.84	10.32	10.86	10.02	10.10	10.32	9.71	9.99	9.78	10.04
2051	10.80	10.69	10.57	11.04	11.57	10.74	10.82	11.03	10.44	10.71	10.51	10.75
2052	7.71	7.65	7.58	7.87	8.21	7.68	7.73	7.85	7.46	7.62	7.51	7.67
2053	7.22	7.17	7.11	7.36	7.65	7.20	7.24	7.35	6.99	7.12	7.05	7.19
2054	7.39	7.35	7.29	7.53	7.80	7.38	7.42	7.51	7.16	7.28	7.22	7.35
2055	9.04	8.99	8.92	9.22	9.58	9.03	9.08	9.21	8.70	8.85	8.80	9.00
2056	6.12	6.10	6.06	6.21	6.38	6.11	6.14	6.18	5.97	6.04	6.01	6.08
2057	8.15	8.12	8.07	8.28	8.52	8.14	8.18	8.25	7.92	8.02	8.00	8.10
2058	7.45	7.43	7.38	7.56	7.77	7.44	7.47	7.53	7.23	7.31	7.30	7.38
2059	7.42	7.40	7.36	7.52	7.72	7.41	7.44	7.50	7.21	7.29	7.28	7.38
2060	9.57	9.55	9.50	9.72	9.98	9.58	9.62	9.71	9.29	9.40	9.40	9.54
2061	10.33	10.31	10.25	10.49	10.76	10.33	10.38	10.47	10.02	10.12	10.14	10.29
2062	6.95	6.94	6.91	7.04	7.18	6.95	6.98	7.02	6.79	6.85	6.85	6.92
2063	6.82	6.81	6.78	6.90	7.03	6.82	6.84	6.88	6.70	6.76	6.73	6.79
2064	6.88	6.88	6.85	6.96	7.09	6.89	6.91	6.95	6.78	6.84	6.80	6.87
2065	7.20	7.20	7.17	7.28	7.40	7.21	7.23	7.26	7.08	7.14	7.12	7.17
2066	7.24	7.24	7.22	7.32	7.44	7.25	7.27	7.30	7.13	7.19	7.17	7.22
2067	6.43	6.43	6.41	6.49	6.59	6.44	6.45	6.48	6.35	6.40	6.37	6.42
Total Loads	2483.49	2494.78	2458.85	2610.22	2767.83	2512.58	2538.36	2569.31	2372.32	2434.24	2440.16	2541.71

Table RE3
Tri+ PCB Load Over Federal Dam

Year	Constant Upstream Boundary Assumption (0.16 kg/day)							
	P3NAcw (No Action)	r01cw (0/0/3)	r02cw (0/10/mna)	r03cw (0/mna/mna)	r04cw (3/10/10)	r05cw (3/mna/mna)	r06cw (0/10/10)	r07cw (10/mna/mna)
1998	330.29	330.29	330.29	330.29	330.29	330.29	330.29	330.29
1999	157.67	157.67	157.67	157.67	157.67	157.67	157.67	157.67
2000	205.50	205.50	205.50	205.50	205.50	205.50	205.50	205.50
2001	236.73	236.73	236.73	236.73	236.73	236.73	236.73	236.73
2002	137.85	137.85	137.85	137.85	137.85	137.85	137.85	137.85
2003	130.51	130.51	130.51	130.51	130.51	130.51	130.51	130.51
2004	95.66	94.56	94.67	94.56	94.83	94.93	94.67	95.04
2005	111.39	105.31	106.37	105.31	106.80	107.42	106.00	107.91
2006	129.01	112.65	115.97	112.65	116.41	118.12	115.06	120.22
2007	128.92	103.51	108.86	104.41	102.03	111.53	107.72	118.35
2008	71.28	58.10	58.65	59.15	59.21	63.33	58.02	66.83
2009	67.57	52.36	51.09	54.74	53.99	59.04	50.35	62.70
2010	131.00	84.99	88.37	102.03	96.04	111.81	87.04	120.08
2011	103.84	64.15	67.63	80.15	74.22	87.93	66.84	94.56
2012	101.03	65.94	68.86	78.06	75.33	85.66	68.15	92.14
2013	104.58	67.79	70.60	80.75	77.76	88.68	70.09	95.44
2014	83.79	58.27	60.03	65.74	65.64	71.86	59.74	77.06
2015	80.29	56.47	58.00	63.38	63.38	69.15	57.77	74.05
2016	52.56	39.43	40.29	43.06	43.36	46.37	40.16	49.19
2017	51.68	39.84	40.59	42.89	43.50	46.00	40.48	48.65
2018	64.02	44.28	45.50	51.36	49.41	55.43	45.38	58.91
2019	48.73	37.44	38.12	40.70	40.76	43.48	38.03	45.84
2020	63.30	48.14	48.96	52.28	52.68	56.14	48.87	59.40
2021	60.01	46.09	46.83	50.08	50.15	53.51	46.75	56.40
2022	47.03	38.23	38.69	40.43	40.96	42.79	38.63	44.77
2023	45.15	37.42	37.81	39.26	39.86	41.38	37.76	43.17
2024	72.84	57.07	57.85	61.58	61.57	65.40	57.76	68.59
2025	53.41	43.74	44.19	46.28	46.64	48.80	44.14	50.90
2026	53.64	43.97	44.41	46.59	46.83	49.06	44.37	51.11
2027	45.34	38.63	38.94	40.22	40.72	42.06	38.89	43.59
2028	53.61	45.38	45.73	47.35	47.90	49.57	45.68	51.41
2029	53.93	46.18	46.51	48.03	48.56	50.14	46.46	51.87
2030	52.09	45.32	45.61	46.89	47.45	48.77	45.56	50.32
2031	58.19	49.43	49.79	51.77	51.91	53.92	49.75	55.69
2032	51.49	44.93	45.20	46.54	46.87	48.24	45.16	49.64
2033	46.98	41.63	41.84	42.88	43.25	44.32	41.81	45.49
2034	56.74	51.00	51.22	52.23	52.83	53.87	51.18	55.20
2035	62.56	57.09	57.41	58.49	59.04	59.94	57.37	61.25
2036	74.58	68.68	69.04	70.04	70.50	71.57	69.00	72.79
2037	69.94	64.21	64.52	65.39	65.84	66.78	64.47	67.91
2038	54.47	50.81	51.01	51.50	51.96	52.50	50.98	53.30
2039	72.67	66.77	67.05	67.93	68.40	69.35	67.01	70.49
2040	49.56	46.29	46.44	46.89	47.24	47.74	46.41	48.41
2041	49.04	46.35	47.33	47.67	48.06	48.38	47.30	49.06
2042	37.54	35.88	37.25	37.45	37.72	37.96	37.23	38.35
2043	67.28	62.98	64.84	65.46	65.89	66.58	64.79	67.44
2044	64.24	59.76	59.73	60.26	60.64	61.23	59.69	61.98
2045	52.70	49.61	49.24	49.66	49.95	50.40	49.22	50.98
2046	52.07	49.88	49.50	49.77	50.10	50.42	49.47	50.90
2047	45.97	43.91	43.66	43.93	44.17	44.47	43.64	44.89
2048	46.61	43.82	43.63	43.88	44.10	44.39	43.60	44.80
2049	41.90	39.75	39.62	39.81	39.99	40.22	39.59	40.54
2050	51.65	48.55	48.43	48.72	48.93	49.26	48.40	49.69
2051	55.90	52.94	52.83	53.08	53.31	53.62	52.79	54.04
2052	41.10	39.35	39.29	39.46	39.61	39.81	39.27	40.08
2053	39.34	37.82	37.79	37.93	38.06	38.24	37.77	38.47
2054	40.70	39.26	39.25	39.39	39.51	39.68	39.22	39.91
2055	50.26	48.24	48.24	48.45	48.60	48.84	48.21	49.15
2056	34.20	33.47	33.48	33.54	33.64	33.74	33.45	33.88
2057	45.82	44.71	44.73	44.84	44.96	45.11	44.70	45.31
2058	41.92	40.98	41.00	41.09	41.22	41.34	40.97	41.52
2059	42.28	41.34	41.36	41.46	41.56	41.69	41.34	41.86
2060	54.58	53.22	53.26	53.41	53.52	53.71	53.22	53.94
2061	59.16	57.73	57.79	57.95	58.07	58.28	57.75	58.53
2062	40.22	39.53	39.56	39.63	39.71	39.81	39.53	39.94
2063	39.55	38.92	38.96	39.02	39.10	39.19	38.93	39.31
2064	40.12	39.52	39.56	39.63	39.68	39.78	39.53	39.90
2065	41.83	41.31	41.35	41.40	41.47	41.56	41.32	41.67
2066	42.20	41.69	41.73	41.79	41.85	41.94	41.71	42.05
2067	37.66	37.22	37.26	37.31	37.35	37.43	37.23	37.52

Total Loads

REFINED ENGINEERING MODELING

Figure Number	Title	Model Runs Included
RE1	Comparison between Forecasts for Thompson Island Pool Cohesive Surficial Sediments - Constant Upstream Load Conditions	-Constant Load No Action-Scenario P3NAcw -Scenarios R01cw through R07cw
RE2	Comparison between Forecasts for Thompson Island Pool Non-Cohesive Surficial Sediments - Constant Upstream Load Conditions	same as above
RE3	Comparison between Forecasts for Schuylerville Cohesive Surficial Sediments - Constant Upstream Load Conditions	same as above
RE4	Comparison between Forecasts for Schuylerville Non-Cohesive Surficial Sediments - Constant Upstream Load Conditions	same as above
RE5	Comparison between Forecasts for Stillwater Cohesive Surficial Sediments - Constant Upstream Load Conditions	same as above
RE6	Comparison between Forecasts for Stillwater Non-Cohesive Surficial Sediments - Constant Upstream Load Conditions	same as above
RE7	Comparison between Forecasts for Waterford Cohesive Surficial Sediments - Constant Upstream Load Conditions	same as above
RE8	Comparison between Forecasts for Waterford Non-Cohesive Surficial Sediments - Constant Upstream Load Conditions	same as above
RE9	Comparison between Forecasts for Federal Dam Non-Cohesive Surficial Sediments - Constant Upstream Load Conditions	same as above
RE10	Comparison between Water Column Forecasts at Thompson Island Dam - Constant Upstream Load Conditions	same as above
RE11	Comparison between Water Column Forecasts at Northumberland Dam - Constant Upstream Load Conditions	same as above
RE12	Comparison between Water Column Forecasts at Stillwater - Constant Upstream Load Conditions	same as above

RE13	Comparison between Water Column Forecasts at Waterford - Constant Upstream Load Conditions	same as above
RE14	Comparison between Water Column Forecasts at Federal Dam - Constant Upstream Load Conditions	same as above
RE15	Comparison between Forecasts for Thompson Island Pool Cohesive Surficial Sediments - Step Down Upstream Load Conditions	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -No Action w/ Load 0.16 kg/d to 0 kg/d - Scenario P3NAs0 -Scenarios R01s2 through R07s2 -Scenarios R01s0
RE16	Comparison between Forecasts for Thompson Island Pool Non-Cohesive Surficial Sediments - Step Down Upstream Load Conditions	same as above
RE17	Comparison between Forecasts for Schuylerville Cohesive Surficial Sediments - Step Down Upstream Load Conditions	same as above
RE18	Comparison between Forecasts for Schuylerville Non-Cohesive Surficial Sediments - Step Down Upstream Load Conditions	same as above
RE19	Comparison between Forecasts for Stillwater Cohesive Surficial Sediments - Step Down Upstream Load Conditions	same as above
RE20	Comparison between Forecasts for Stillwater Non-Cohesive Surficial Sediments - Step Down Upstream Load Conditions	same as above
RE21	Comparison between Forecasts for Waterford Cohesive Surficial Sediments - Step Down Upstream Load Conditions	same as above
RE22	Comparison between Forecasts for Waterford Non-Cohesive Surficial Sediments - Step Down Upstream Load Conditions	same as above
RE23	Comparison between Forecasts for Federal Dam Non-Cohesive Surficial Sediments - Step Down Upstream Load Conditions	same as above
RE24	Comparison between Water Column Forecasts at Thompson Island Dam - Step Down Upstream Load Conditions	same as above
RE25	Comparison between Water Column Forecasts at Northumberland Dam - Step Down Upstream Load Conditions	same as above

RE26	Comparison between Water Column Forecasts at Stillwater - Step Down Upstream Load Conditions	same as above
RE27	Comparison between Water Column Forecasts at Waterford - Step Down Upstream Load Conditions	same as above
RE28	Comparison between Water Column Forecasts at Federal Dam - Step Down Upstream Load Conditions	same as above
RE29	Comparison between Forecasts for Thompson Island Pool Cohesive Surficial Sediments - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	-Scenarios R07s2, R10s2, R04s2, R09s2, R01s2, R08s2
RE30	Comparison between Forecasts for Thompson Island Pool Non-Cohesive Surficial Sediments - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE31	Comparison between Forecasts for Schuylerville Cohesive Surficial Sediments - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE32	Comparison between Forecasts for Schuylerville Non-Cohesive Surficial Sediments - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE33	Comparison between Forecasts for Stillwater Cohesive Surficial Sediments - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE34	Comparison between Forecasts for Stillwater Non-Cohesive Surficial Sediments - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE35	Comparison between Forecasts for Waterford Cohesive Surficial Sediments - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE36	Comparison between Forecasts for Waterford Non-Cohesive Surficial Sediments - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE37	Comparison between Forecasts for Federal Dam Non-Cohesive Surficial Sediments - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE38	Comparison between Water Column Forecasts at Thompson Island Dam - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE39	Comparison between Water Column Forecasts at Northumberland Dam - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above

RE40	Comparison between Water Column Forecasts at Stillwater - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE41	Comparison between Water Column Forecasts at Waterford - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE42	Comparison between Water Column Forecasts at Federal Dam - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE43	Comparison between Forecasts for Thompson Island Pool Cohesive Surficial Sediments - Channel Dredging in River Section 1/River Section 3 Removal	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -Scenarios R11s2, R12s2, R06s2, R13s2, R09s2
RE44	Comparison between Forecasts for Thompson Island Pool Non-Cohesive Surficial Sediments - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE45	Comparison between Forecasts for Schuylerville Cohesive Surficial Sediments - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE46	Comparison between Forecasts for Schuylerville Non-Cohesive Surficial Sediments - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE47	Comparison between Forecasts for Stillwater Cohesive Surficial Sediments - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE48	Comparison between Forecasts for Stillwater Non-Cohesive Surficial Sediments - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE49	Comparison between Forecasts for Waterford Cohesive Surficial Sediments - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE50	Comparison between Forecasts for Waterford Non-Cohesive Surficial Sediments - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE51	Comparison between Forecasts for Federal Dam Non-Cohesive Surficial Sediments - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE52	Comparison between Water Column Forecasts at Thompson Island Dam - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE53	Comparison between Water Column Forecasts at Northumberland Dam - Channel Dredging in River Section 1/River Section 3 Removal	same as above

RE54	Comparison between Water Column Forecasts at Stillwater - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE55	Comparison between Water Column Forecasts at Waterford - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE56	Comparison between Water Column Forecasts at Federal Dam - Channel Dredging in River Section 1/River Section 3 Removal	same as above
RE57	Comparison between Forecasts for Thompson Island Pool Cohesive Surficial Sediments - Cap Scenarios	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -Scenarios R017s2, R18s2, R19s2
RE58	Comparison between Forecasts for Thompson Island Pool Non-Cohesive Surficial Sediments - Cap Scenarios	same as above
RE59	Comparison between Forecasts for Schuylerville Cohesive Surficial Sediments - Cap Scenarios	same as above
RE60	Comparison between Forecasts for Schuylerville Non-Cohesive Surficial Sediments - Cap Scenarios	same as above
RE61	Comparison between Forecasts for Stillwater Cohesive Surficial Sediments - Cap Scenarios	same as above
RE62	Comparison between Forecasts for Stillwater Non-Cohesive Surficial Sediments - Cap Scenarios	same as above
RE63	Comparison between Forecasts for Waterford Cohesive Surficial Sediments - Cap Scenarios	same as above
RE64	Comparison between Forecasts for Waterford Non-Cohesive Surficial Sediments - Cap Scenarios	same as above
RE65	Comparison between Forecasts for Federal Dam Non-Cohesive Surficial Sediments - Cap Scenarios	same as above
RE66	Comparison between Water Column Forecasts at Thompson Island Dam - Cap Scenarios	same as above
RE67	Comparison between Water Column Forecasts at Northumberland Dam - Cap Scenarios	same as above
RE68	Comparison between Water Column Forecasts at Stillwater - Cap Scenarios	same as above

RE69	Comparison between Water Column Forecasts at Waterford - Cap Scenarios	same as above
RE70	Comparison between Water Column Forecasts at Federal Dam - Cap Scenarios	same as above
RE71	Comparison between Forecasts for Thompson Island Pool Cohesive Surficial Sediments - Alternatives Retained for Detailed Analysis	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -Scenarios R015As2, R14s2, R16s2
RE72	Comparison between Forecasts for Thompson Island Pool Non-Cohesive Surficial Sediments - Alternatives Retained for Detailed Analysis	same as above
RE73	Comparison between Forecasts for Schuylerville Cohesive Surficial Sediments - Alternatives Retained for Detailed Analysis	same as above
RE74	Comparison between Forecasts for Schuylerville Non-Cohesive Surficial Sediments - Alternatives Retained for Detailed Analysis	same as above
RE75	Comparison between Forecasts for Stillwater Cohesive Surficial Sediments - Alternatives Retained for Detailed Analysis	same as above
RE76	Comparison between Forecasts for Stillwater Non-Cohesive Surficial Sediments - Alternatives Retained for Detailed Analysis	same as above
RE77	Comparison between Forecasts for Waterford Cohesive Surficial Sediments - Alternatives Retained for Detailed Analysis	same as above
RE78	Comparison between Forecasts for Waterford Non-Cohesive Surficial Sediments - Alternatives Retained for Detailed Analysis	same as above
RE79	Comparison between Forecasts for Federal Dam Non-Cohesive Surficial Sediments - Alternatives Retained for Detailed Analysis	same as above
RE80	Comparison between Water Column Forecasts at Thompson Island Dam - Alternatives Retained for Detailed Analysis	same as above
RE81	Comparison between Water Column Forecasts at Northumberland Dam - Alternatives Retained for Detailed Analysis	same as above
RE82	Comparison between Water Column Forecasts at Stillwater - Alternatives Retained for Detailed Analysis	same as above
RE83	Comparison between Water Column Forecasts at Waterford - Alternatives Retained for Detailed Analysis7	same as above

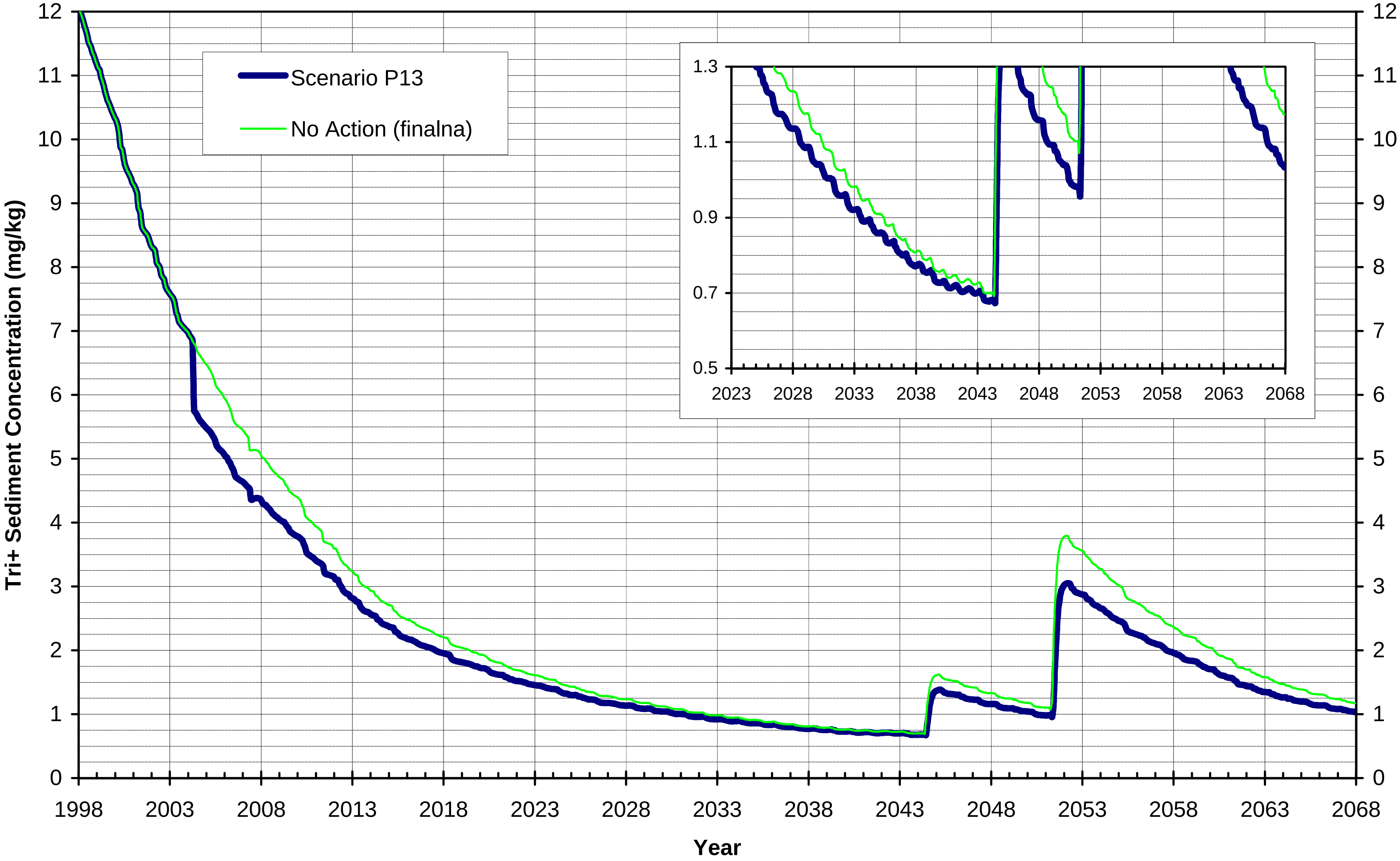
RE84	Comparison between Water Column Forecasts at Federal Dam - Alternatives Retained for Detailed Analysis	same as above
RE85	Comparison between Forecasts for Thompson Island Pool Cohesive Surficial Sediments - Removal Scenarios Sensitivity Analysis	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -Scenarios R14s2-0, R14s2, R14s2-2, R14s2-5
RE86	Comparison between Forecasts for Thompson Island Pool Non-Cohesive Surficial Sediments - Removal Scenarios Sensitivity Analysis	same as above
RE87	Comparison between Forecasts for Schuylerville Cohesive Surficial Sediments - Removal Scenarios Sensitivity Analysis	same as above
RE88	Comparison between Forecasts for Schuylerville Non-Cohesive Surficial Sediments - Removal Scenarios Sensitivity Analysis	same as above
RE89	Comparison between Forecasts for Stillwater Cohesive Surficial Sediments - Removal Scenarios Sensitivity Analysis	same as above
RE90	Comparison between Forecasts for Stillwater Non-Cohesive Surficial Sediments - Removal Scenarios Sensitivity Analysis	same as above
RE91	Comparison between Forecasts for Waterford Cohesive Surficial Sediments - Removal Scenarios Sensitivity Analysis	same as above
RE92	Comparison between Forecasts for Waterford Non-Cohesive Surficial Sediments - Removal Scenarios Sensitivity Analysis	same as above
RE93	Comparison between Forecasts for Federal Dam Non-Cohesive Surficial Sediments - Removal Scenarios Sensitivity Analysis	same as above
RE94	Comparison between Water Column Forecasts at Thompson Island Dam - Removal Scenarios Sensitivity Analysis	same as above
RE95	Comparison between Water Column Forecasts at Northumberland Dam - Removal Scenarios Sensitivity Analysis	same as above
RE96	Comparison between Water Column Forecasts at Stillwater - Removal Scenarios Sensitivity Analysis	same as above
RE97	Comparison between Water Column Forecasts at Waterford - Removal Scenarios Sensitivity Analysis	same as above

RE98	Comparison between Water Column Forecasts at Federal Dam - Removal Scenarios Sensitivity Analysis	same as above
RE99	Comparison between Forecasts for Thompson Island Pool Cohesive Surficial Sediments - Cap Scenarios Sensitivity Analysis	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -Scenarios R14s2-0, R15As2, R15s2-15, R15s2-25
RE100	Comparison between Forecasts for Thompson Island Pool Non-Cohesive Surficial Sediments - Cap Scenarios Sensitivity Analysis	same as above
RE101	Comparison between Forecasts for Schuylerville Cohesive Surficial Sediments - Cap Scenarios Sensitivity Analysis	same as above
RE102	Comparison between Forecasts for Schuylerville Non-Cohesive Surficial Sediments - Cap Scenarios Sensitivity Analysis	same as above
RE103	Comparison between Forecasts for Stillwater Cohesive Surficial Sediments - Cap Scenarios Sensitivity Analysis	same as above
RE104	Comparison between Forecasts for Stillwater Non-Cohesive Surficial Sediments - Cap Scenarios Sensitivity Analysis	same as above
RE105	Comparison between Forecasts for Waterford Cohesive Surficial Sediments - Cap Scenarios Sensitivity Analysis	same as above
RE106	Comparison between Forecasts for Waterford Non-Cohesive Surficial Sediments - Cap Scenarios Sensitivity Analysis	same as above
RE107	Comparison between Forecasts for Federal Dam Non-Cohesive Surficial Sediments - Cap Scenarios Sensitivity Analysis	same as above
RE108	Comparison between Water Column Forecasts at Thompson Island Dam - Cap Scenarios Sensitivity Analysis	same as above
RE109	Comparison between Water Column Forecasts at Northumberland Dam - Cap Scenarios Sensitivity Analysis	same as above
RE110	Comparison between Water Column Forecasts at Stillwater - Cap Scenarios Sensitivity Analysis	same as above
RE111	Comparison between Water Column Forecasts at Waterford - Cap Scenarios Sensitivity Analysis	same as above

RE112	Comparison between Water Column Forecasts at Federal Dam - Cap Scenarios Sensitivity Analysis	same as above
RE113	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 1 - Constant Upstream Load Conditions	-Constant Load No Action-Scenario P3NAcw -Scenarios R01cw through R07cw
RE114	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 2 - Constant Upstream Load Conditions	same as above
RE115	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 3 - Constant Upstream Load Conditions	same as above
RE116	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 1 - Step Down Upstream Load Conditions	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -No Action w/ Load 0.16 kg/d to 0 kg/d - Scenario P3NAs0 -Scenarios R01s2 through R07s2 -Scenarios R01s0
RE117	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 2 - Step Down Upstream Load Conditions	same as above
RE118	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 3 - Step Down Upsteam Load Conditions	same as above
RE119	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 1 - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	-Scenarios R07s2, R10s2, R04s2, R09s2, R01s2, R08s2
RE120	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 2 - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE121	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 3 - Polygonal Weighting vs. Point Averaged Method for Calculating PCB Percent Removal	same as above
RE122	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 1 - Channel Dredging in River Section 1/Removal in River Section 2	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -Scenarios R11s2, R12s2, R06s2, R13s2, R09s2
RE123	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 2 - Channel Dredging in River Section 1/Removal in River Section 2	same as above

RE124	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 3 - Channel Dredging in River Section 1/Removal in River Section 2	same as above
RE125	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 1 - Cap Scenarios	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -Scenarios R017s2, R18s2, R19s2
RE126	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 2 - Cap Scenarios	same as above
RE127	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 3 - Cap Scenarios	same as above
RE128	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 1 - Alternatives Retained for Detailed Analysis	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -Scenarios R015As2, R14s2, R16s2
RE129	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 2 - Alternatives Retained for Detailed Analysis	same as above
RE130	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 3 - Alternatives Retained for Detailed Analysis	same as above
RE131	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 1 - Removal Scenarios Sensitivity Analysis	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -Scenarios R14s2-0, R14s2, R14s2-2, R14s2-5
RE132	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 2 - Removal Scenarios Sensitivity Analysis	same as above
RE133	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 3 - Removal Scenarios Sensitivity Analysis	same as above
RE134	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 1 - Cap Scenarios Sensitivity Analysis	-Constant Load No Action-Scenario P3NAcw -No Action w/ Load 0.16 kg/d to 0.0256 kg/d-Scenario P3NAs2 -Scenarios R14s2-0, R15As2, R15s2-15, R15s2-25
RE135	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 2 - Cap Scenarios Sensitivity Analysis	same as above
RE136	Comparison between Species-Weighted Fish Fillet Average PCB Concentration in River Section 3 - Cap Scenarios Sensitivity Analysis	same as above

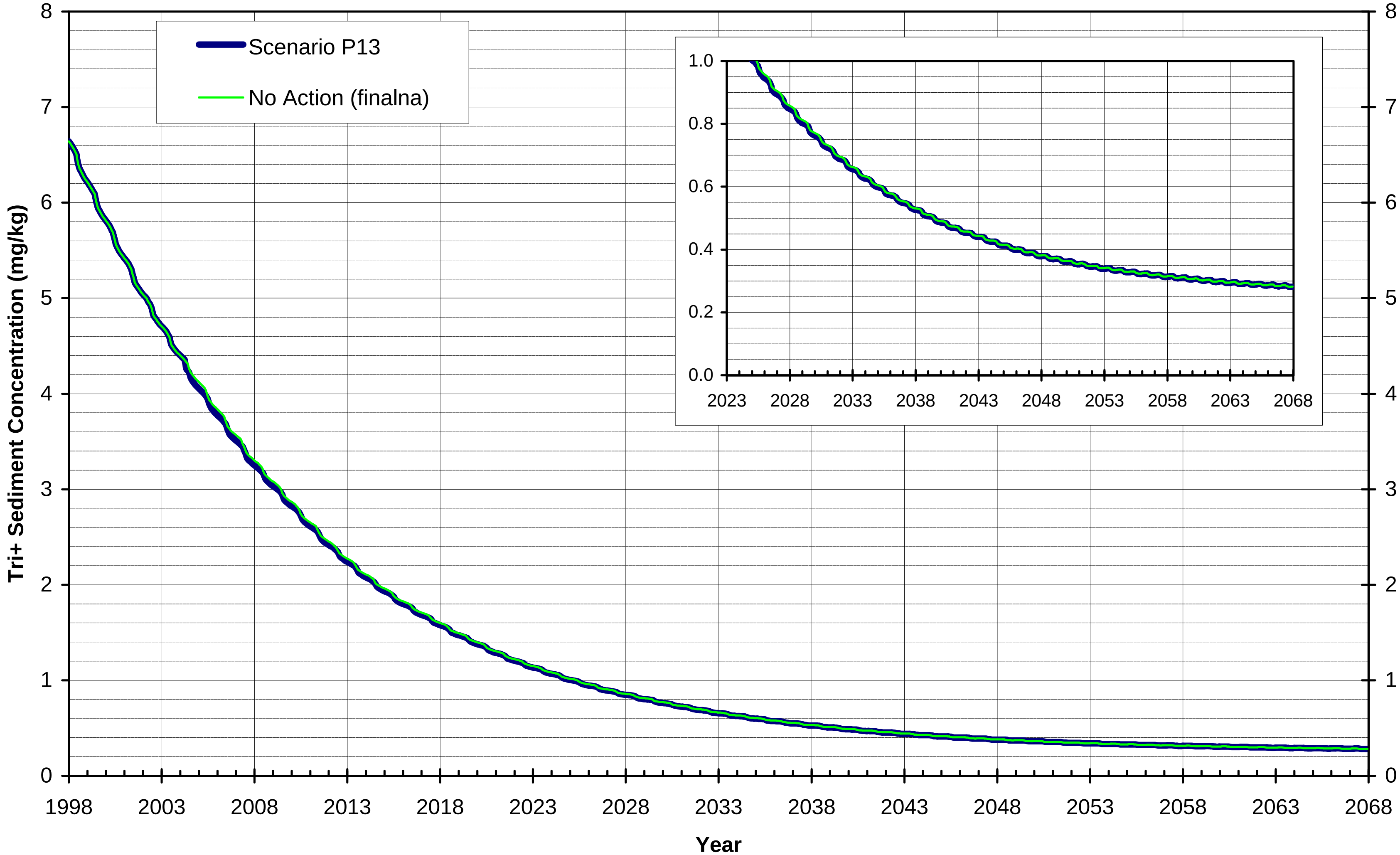
Figure PRE-1
Comparison Between Remediation Scenario P13 and No Action Forecast for TIP Cohesive Surficial Sediment.
Note: This scenario uses 1977 initial sediment



FigsPre1toPre14.xls 12/6/00

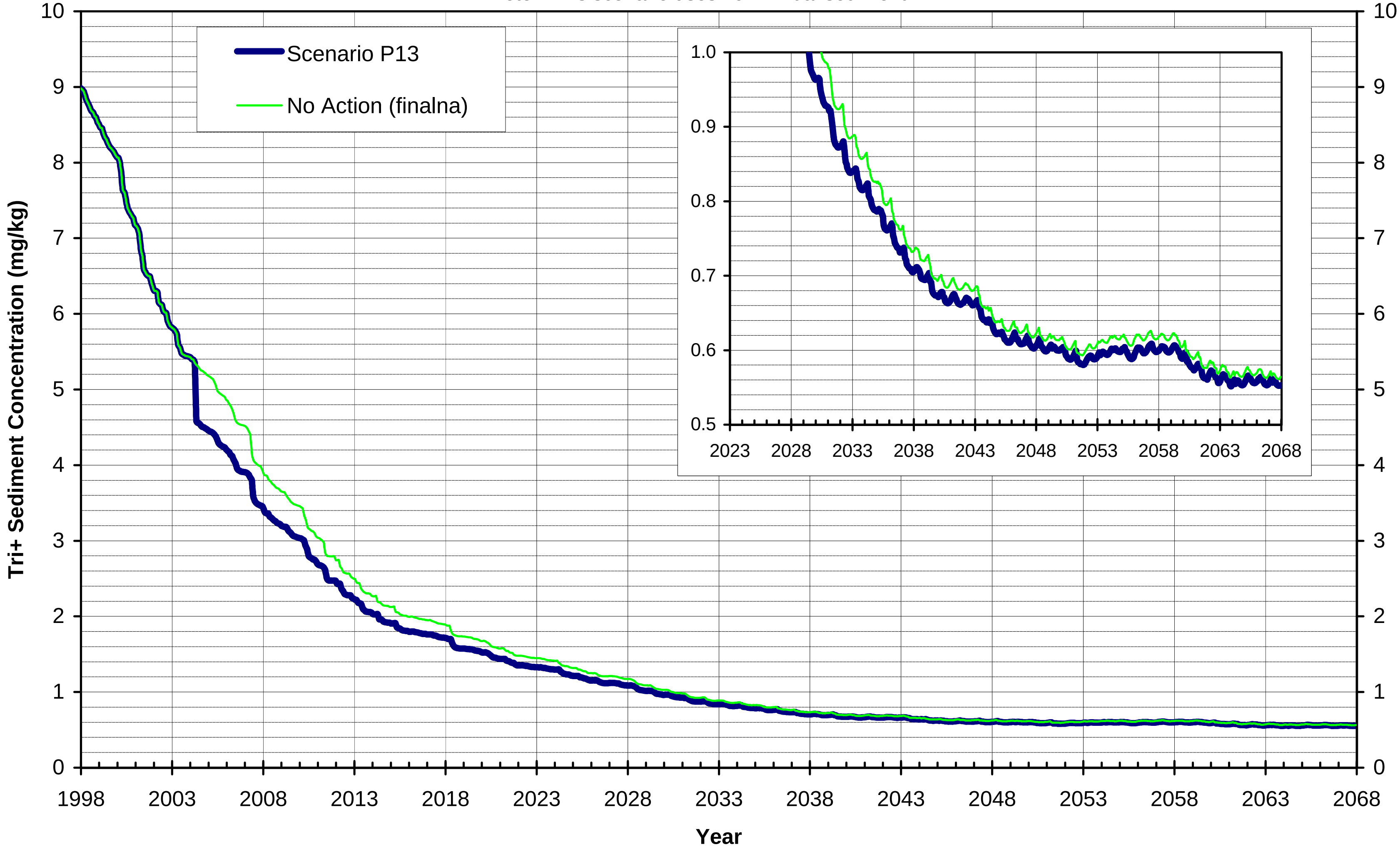
Figure PRE-2
Comparison Between Remediation Scenario P13 and No Action Forecast for TIP Non-Cohesive Surficial Sediment.

Note: This scenario uses 1977 initial sediment



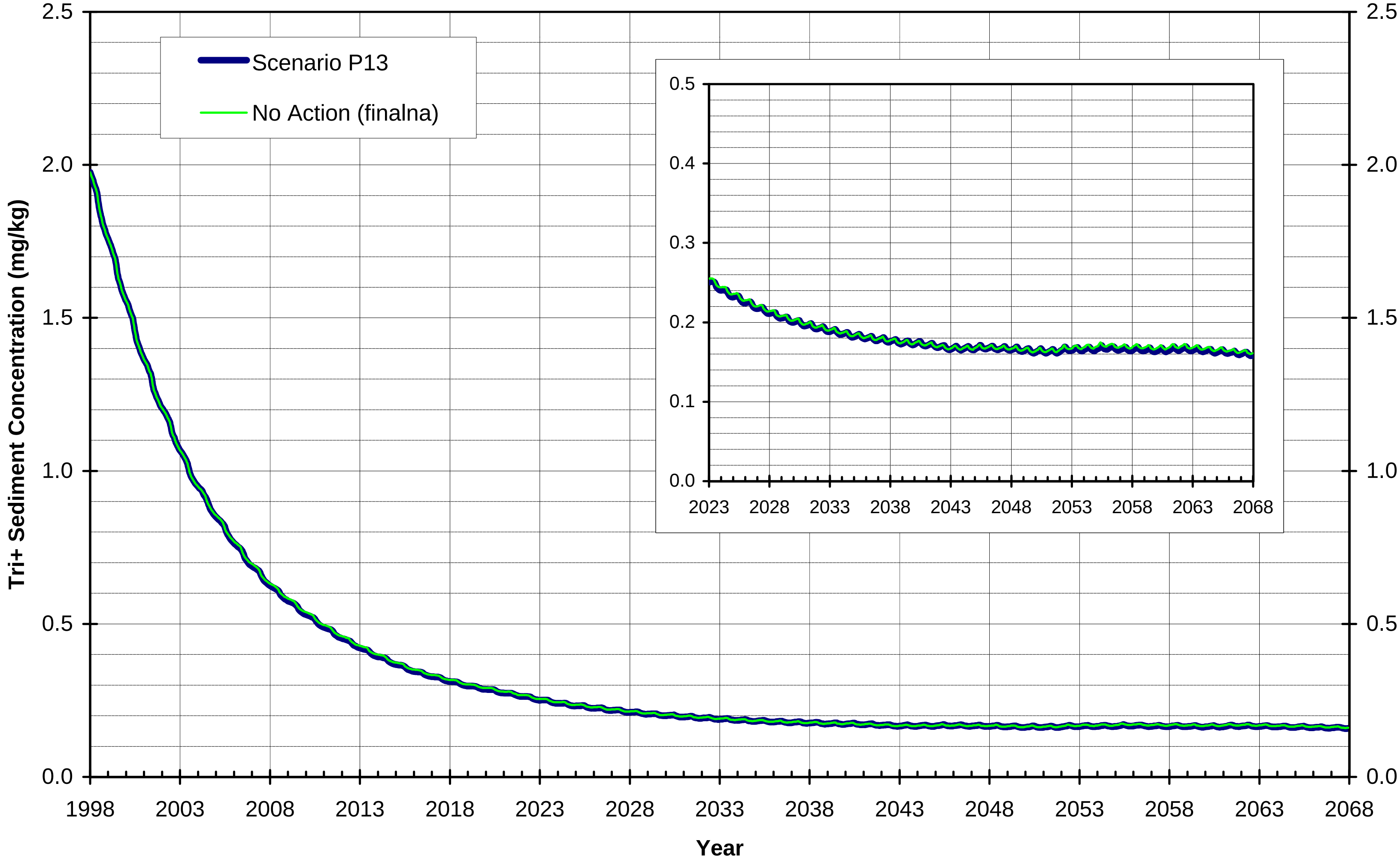
FigsPre1toPre14.xls 12/6/00

Figure PRE-3
Comparison Between Remediation Scenario P13 and No Action Forecast for Schuylerville Cohesive Surficial Sediment.
Note: This scenario uses 1977 initial sediment



FigsPre1toPre14.xls 12/6/00

Figure PRE-4
Comparison Between Remediation Scenario P13 and No Action Forecast for Schuylerville Non-Cohesive Surficial Sediment.
Note: This scenario uses 1977 initial sediment



FigsPre1toPre14.xls 12/6/00

Figure PRE-5
Comparison Between Remediation Scenario P13 and No Action Forecast for Stillwater Cohesive Surficial Sediment.
Note: This scenario uses 1977 initial sediment

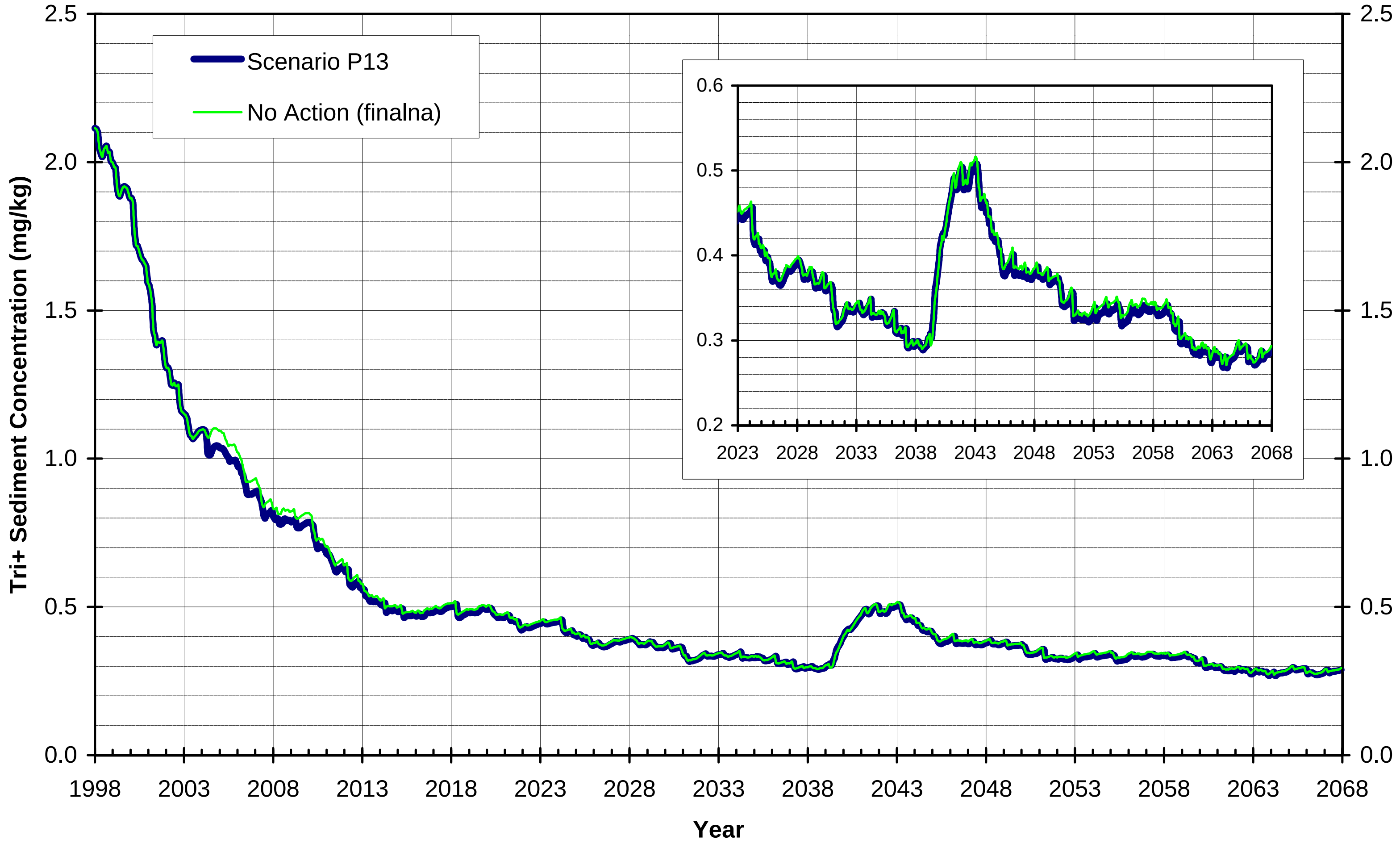


Figure PRE-6
Comparison Between Remediation Scenario P13 and No Action Forecast for Stillwater Non-Cohesive Surficial Sediment

Note: This scenario uses 1977 initial sediment

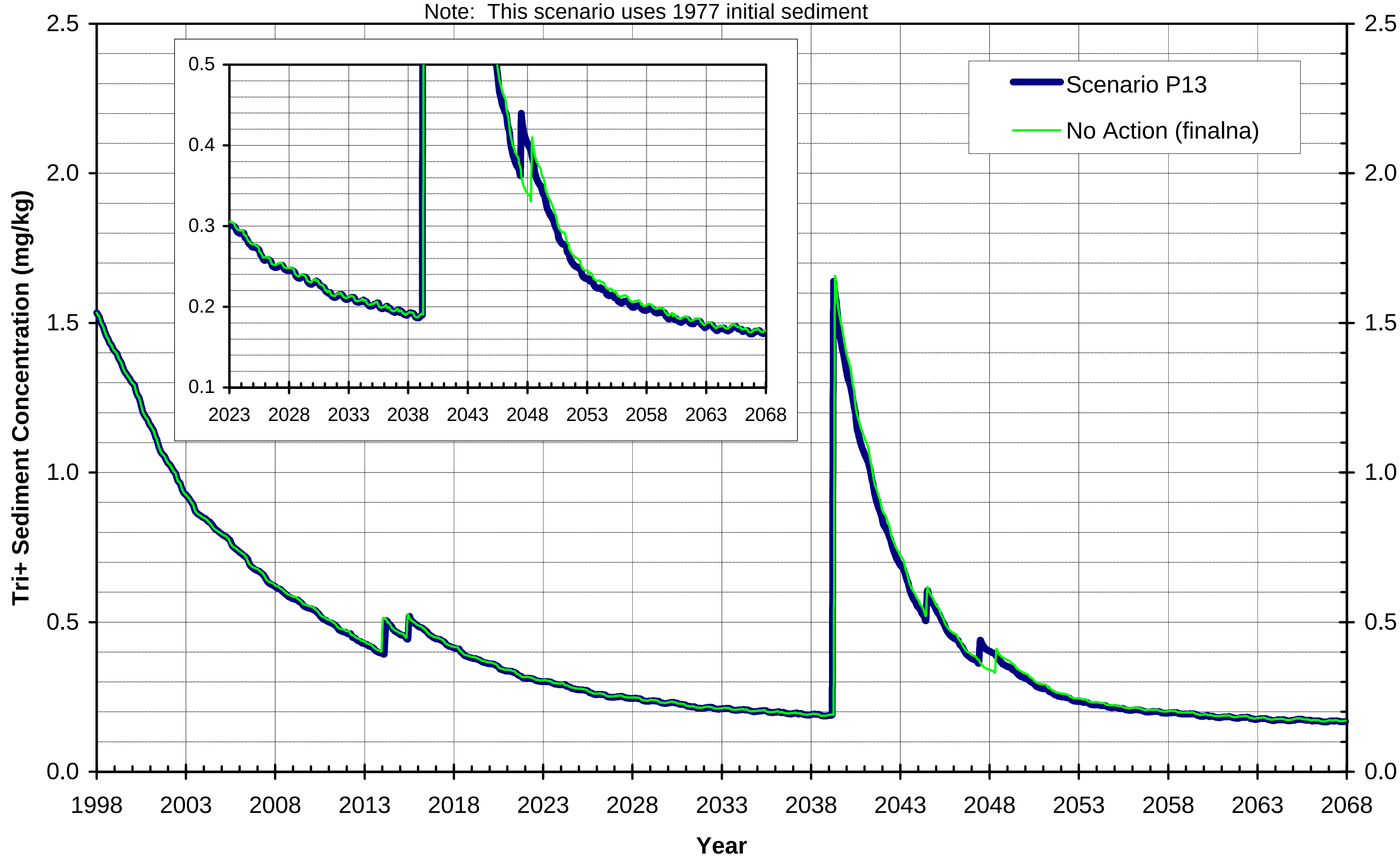
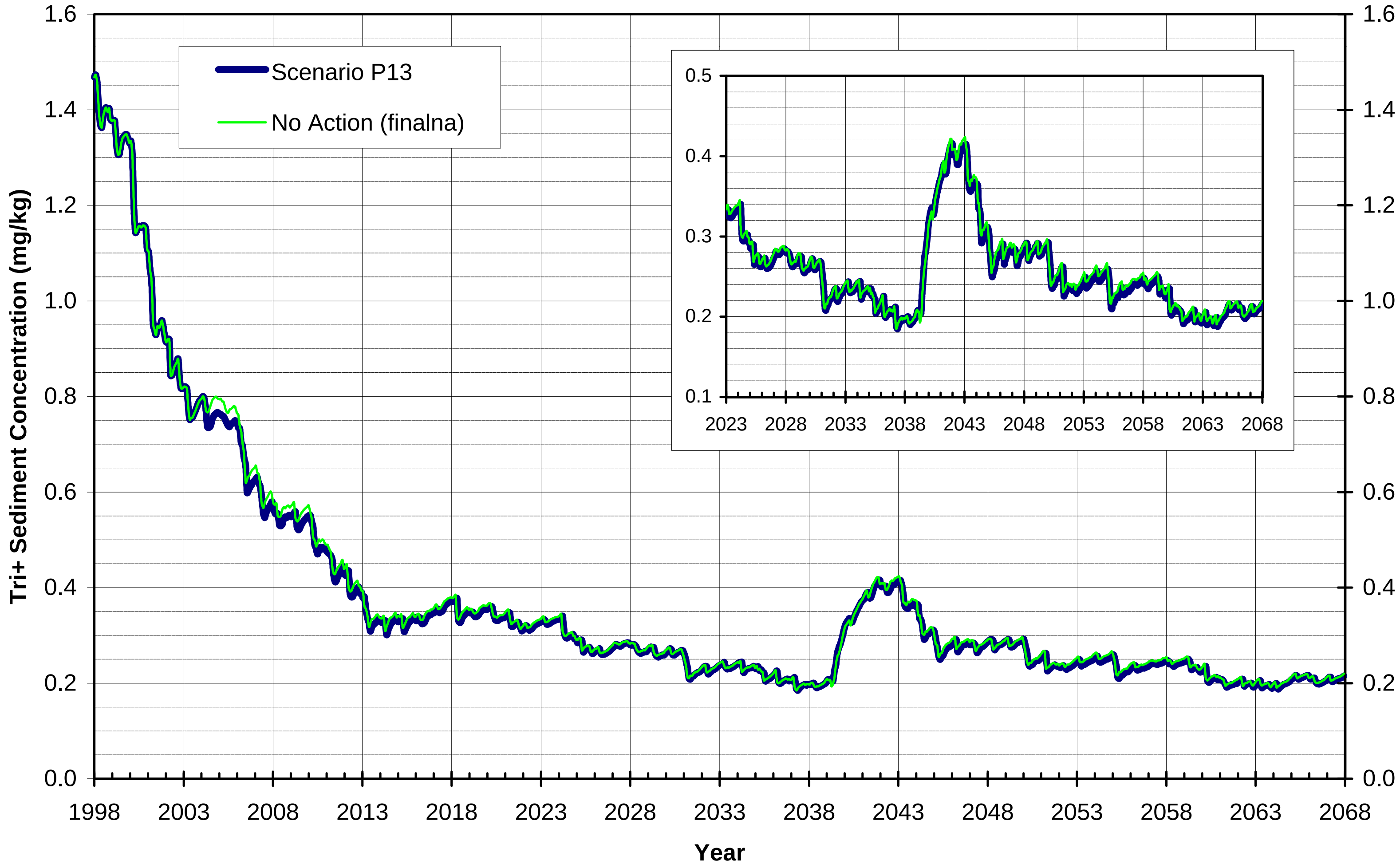


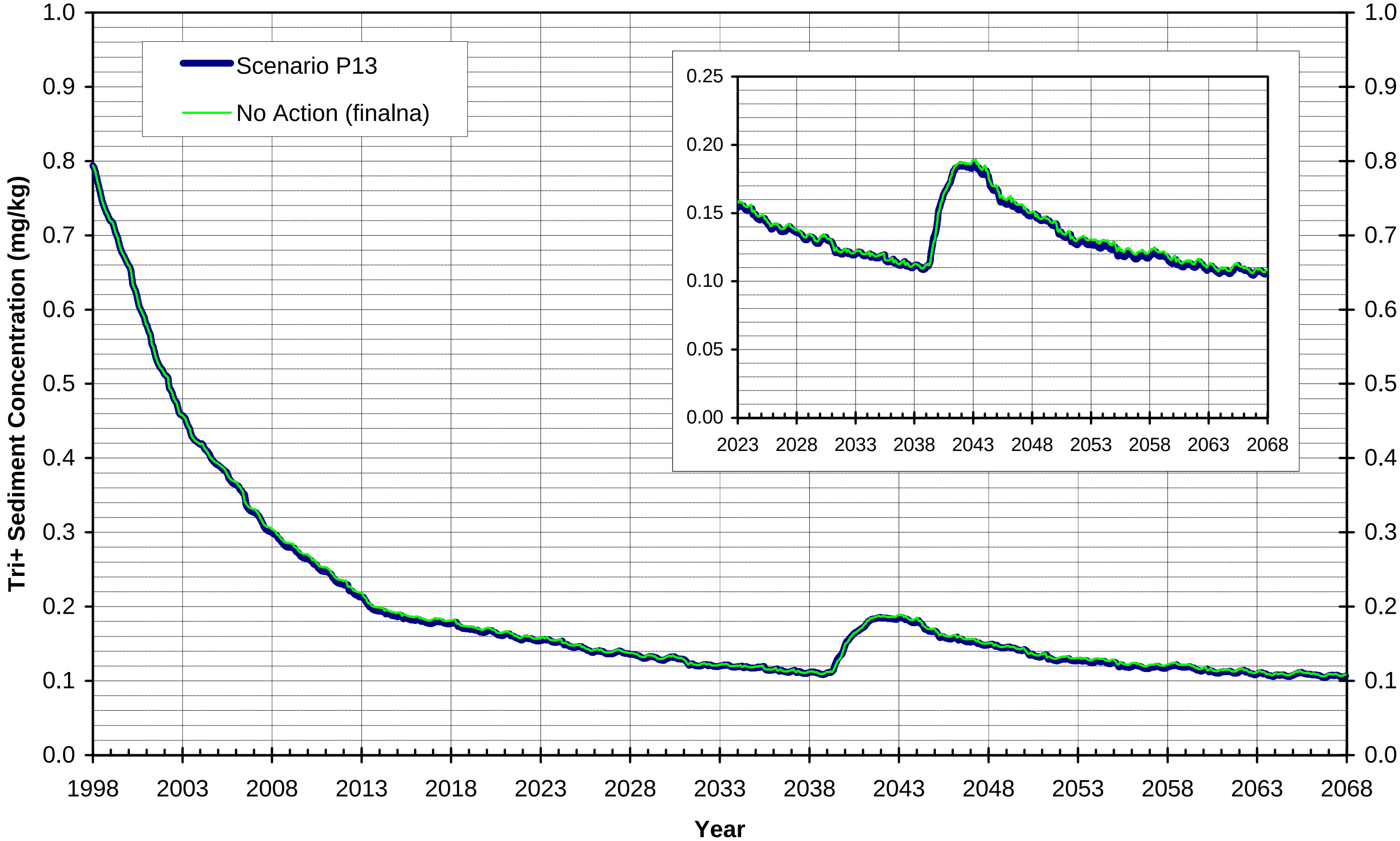
Figure PRE-7
Comparison Between Remediation Scenario P13 and No Action Forecast for Waterford Cohesive Surficial Sediment
Note: This scenario uses 1977 initial sediment



FigsPre1toPre14.xls 12/6/00

Figure PRE-8
Comparison Between Remediation Scenario P13 and No Action Forecast for Waterford Non-Cohesive Surficial Sediment

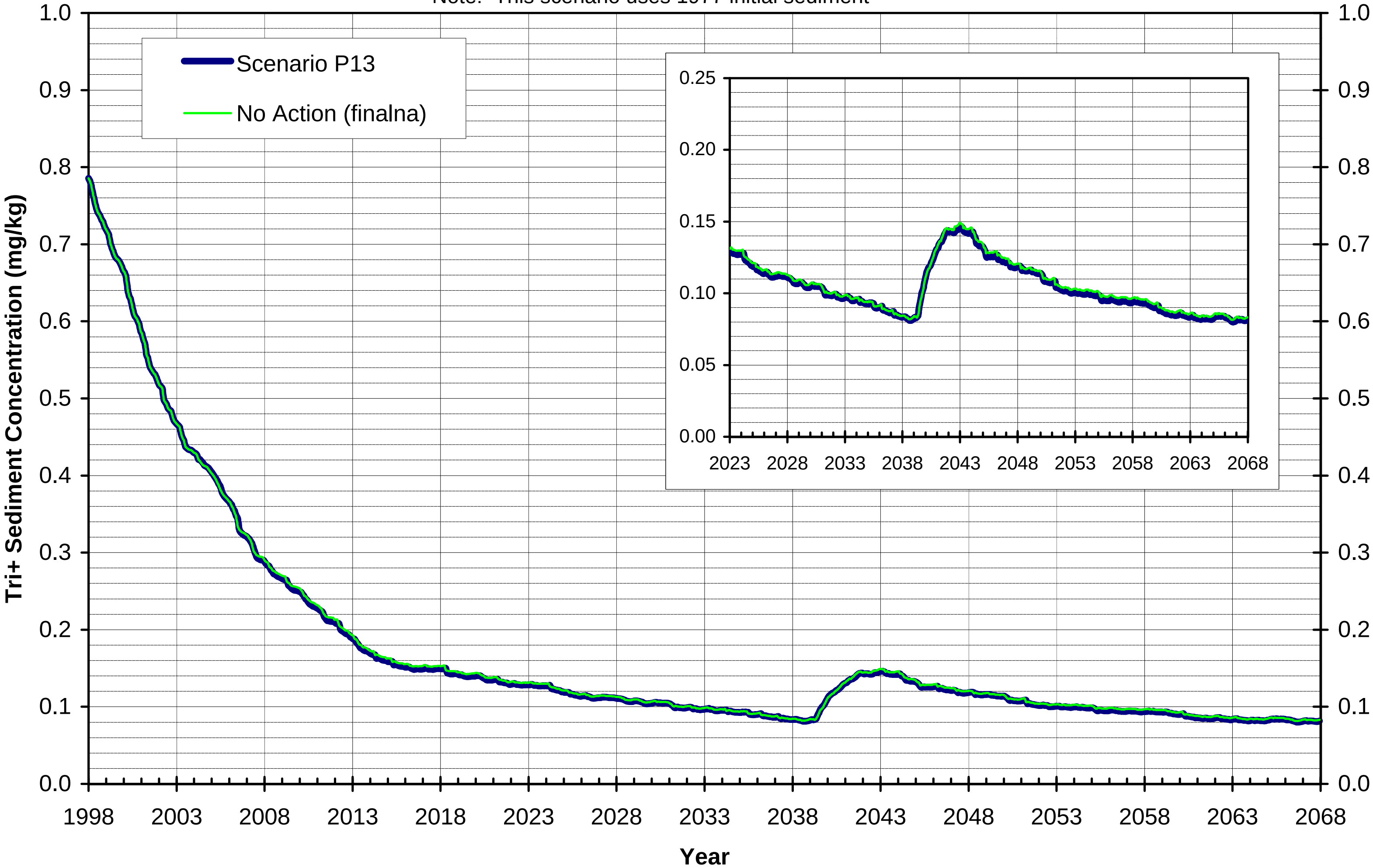
Note: This scenario uses 1977 initial sediment



FigsPre1toPre14.xls 12/6/00

Figure PRE-9
Comparison Between Remediation Scenario P13 and No Action Forecast for Federal Dam Non-Cohesive Surficial Sediment

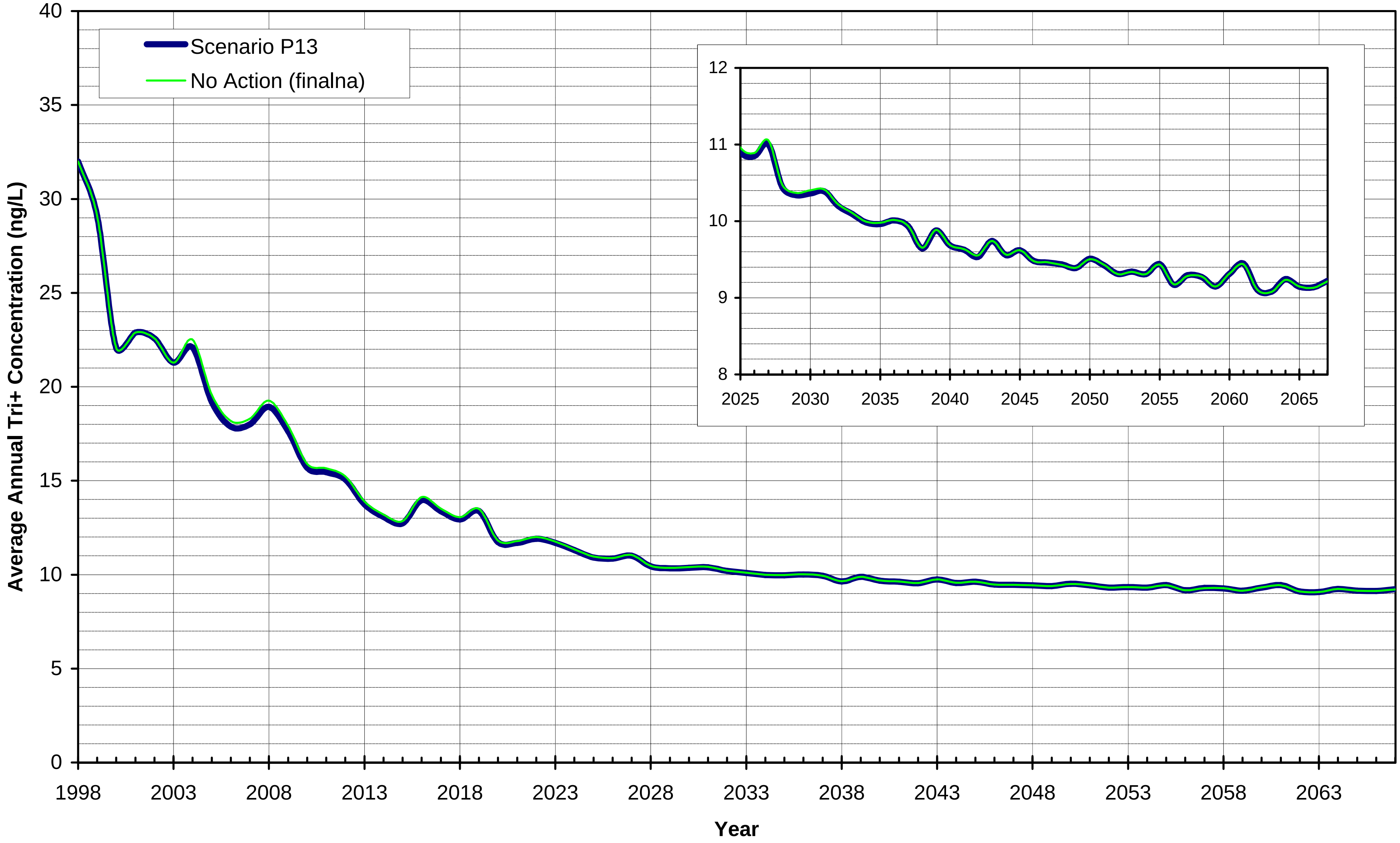
Note: This scenario uses 1977 initial sediment



FigsPre1toPre14.xls 12/6/00

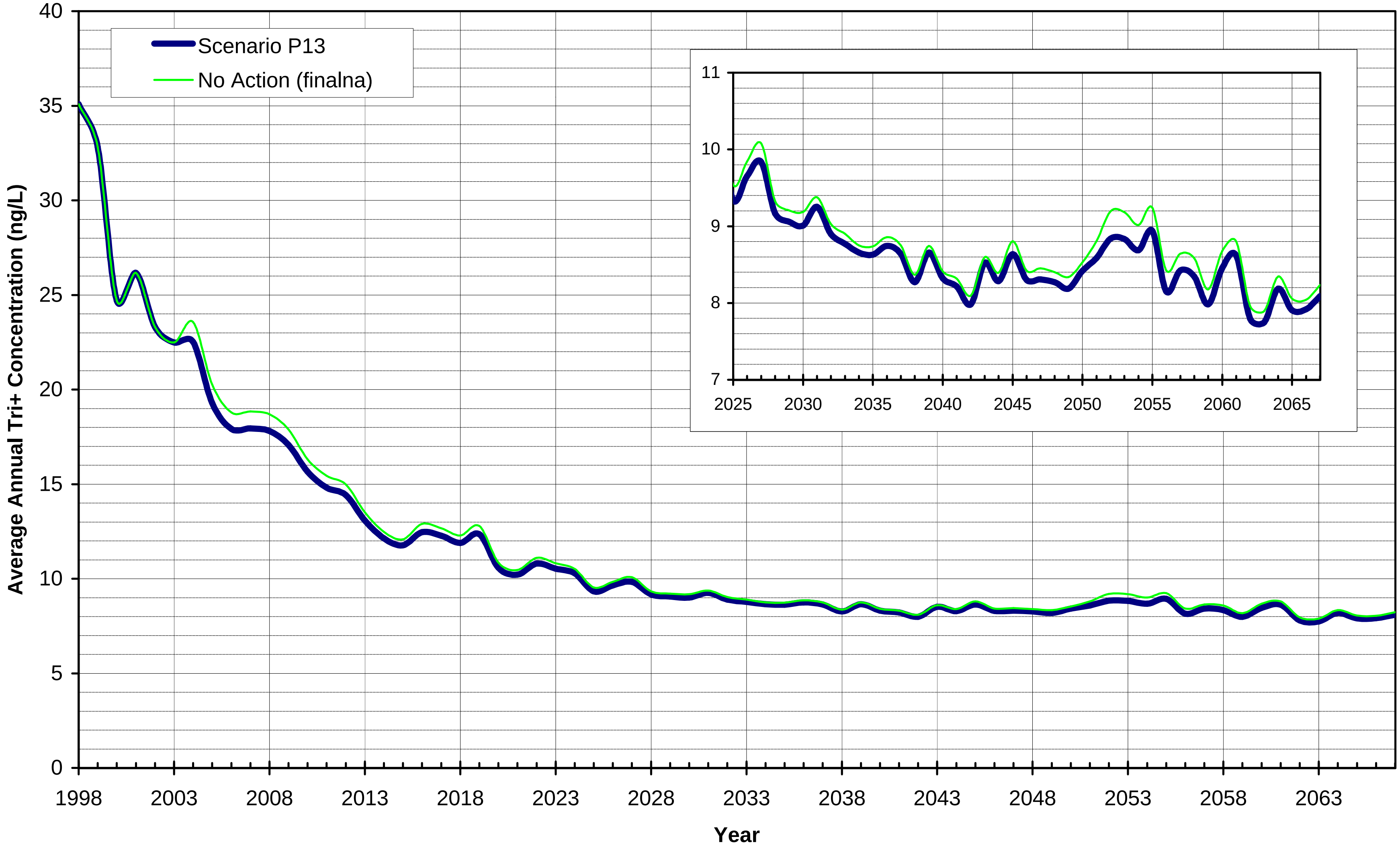
Figure PRE-10
Comparison Between Remediation Scenario P13 and No Action Forecast for Thompson Island Dam Average Annual Tri+ PCB Water Column Concentrations.

Note: This scenario uses 1977 initial sediment



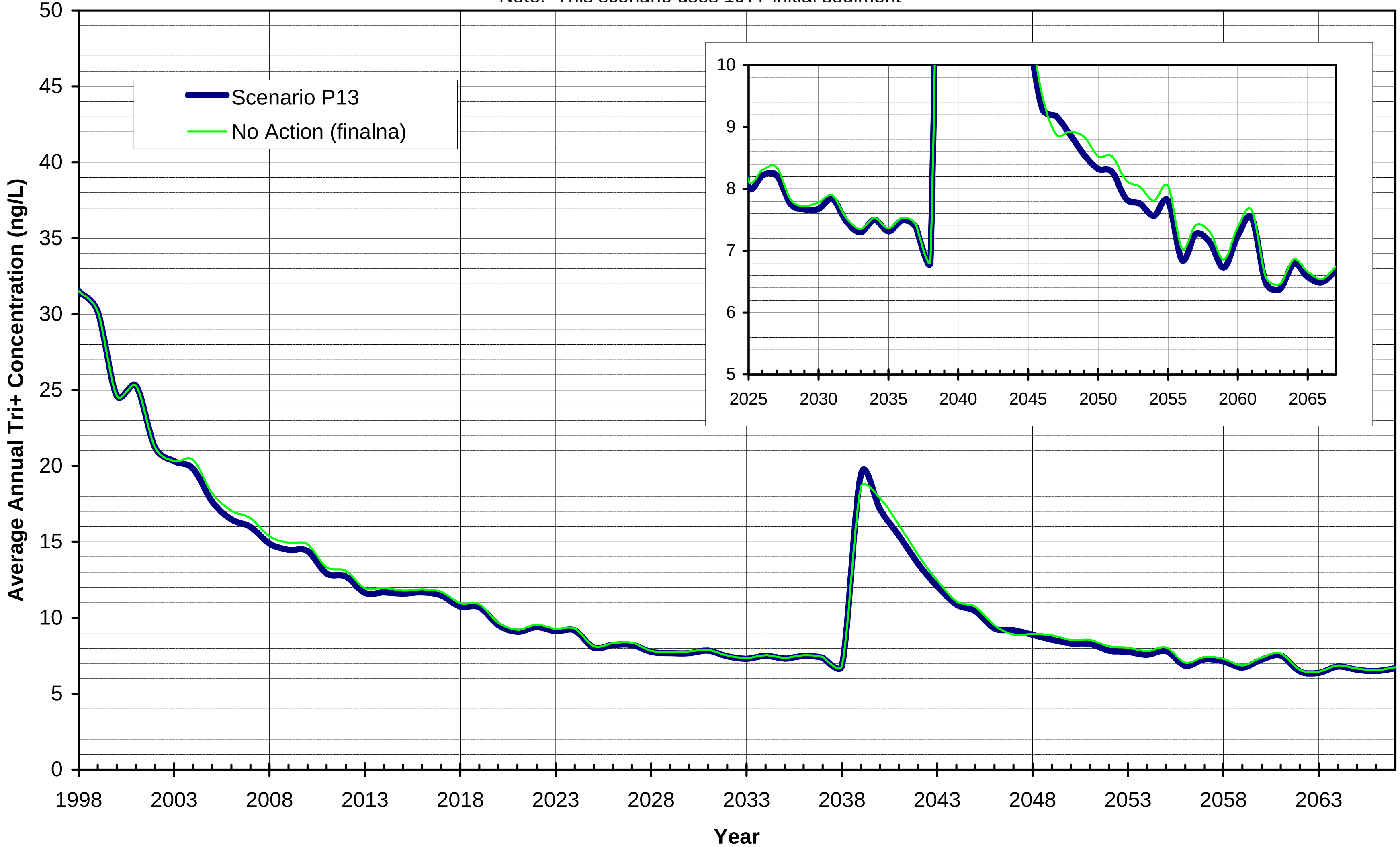
FigsPre1toPre14.xls 12/6/00

Figure PRE-11
Comparison Between Remediation Scenario P13 and No Action Forecast for Schuylerville Average Annual Tri+ PCB Water Column Concentrations.
Note: This scenario uses 1977 initial sediment



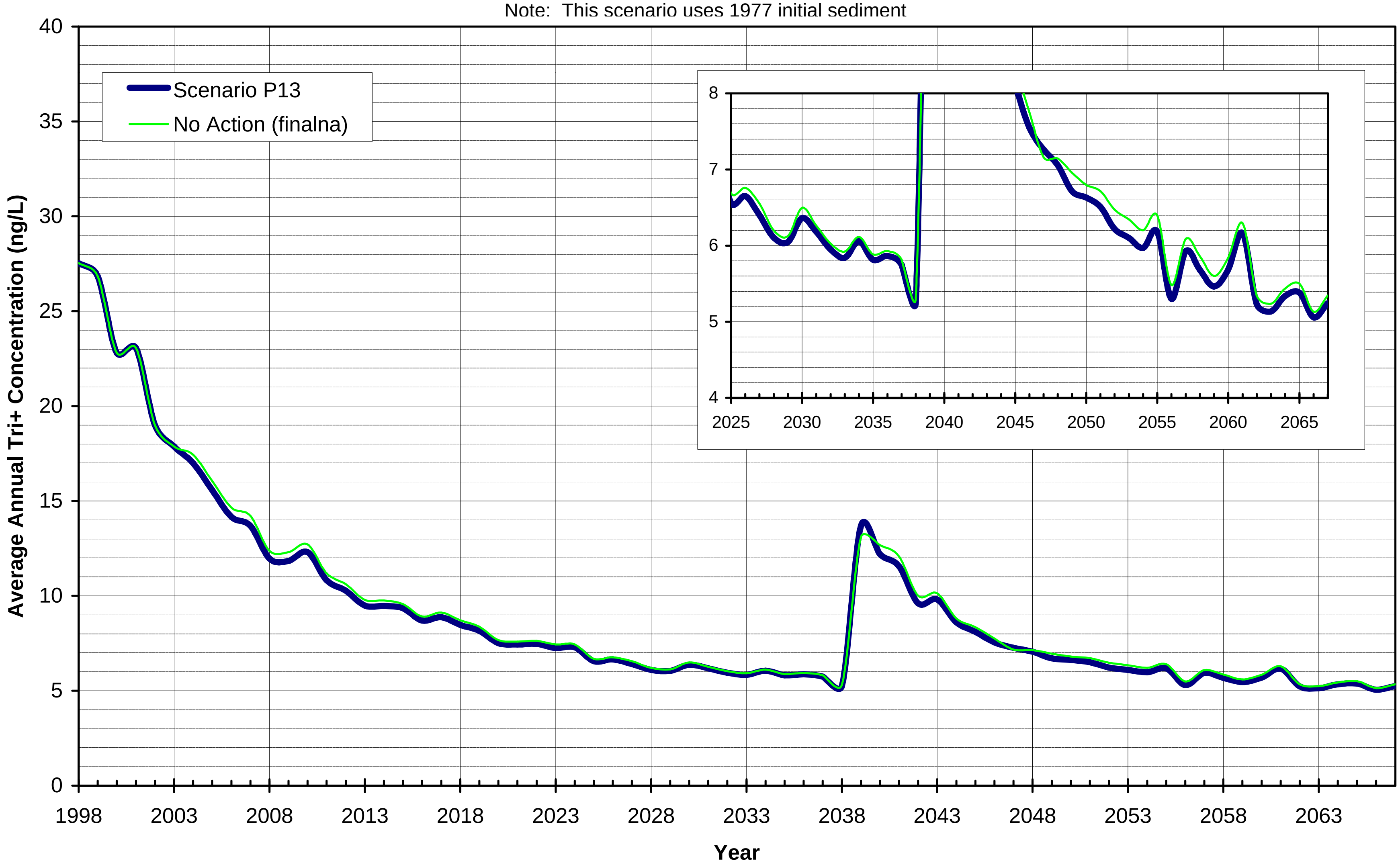
FigsPre1toPre14.xls 12/6/00

Figure PRE-12
Comparison Between Remediation Scenario P13 and No Action Forecast for Stillwater Average Annual Tri+ PCB Water Column Concentrations.
Note: This scenario uses 1977 initial sediment



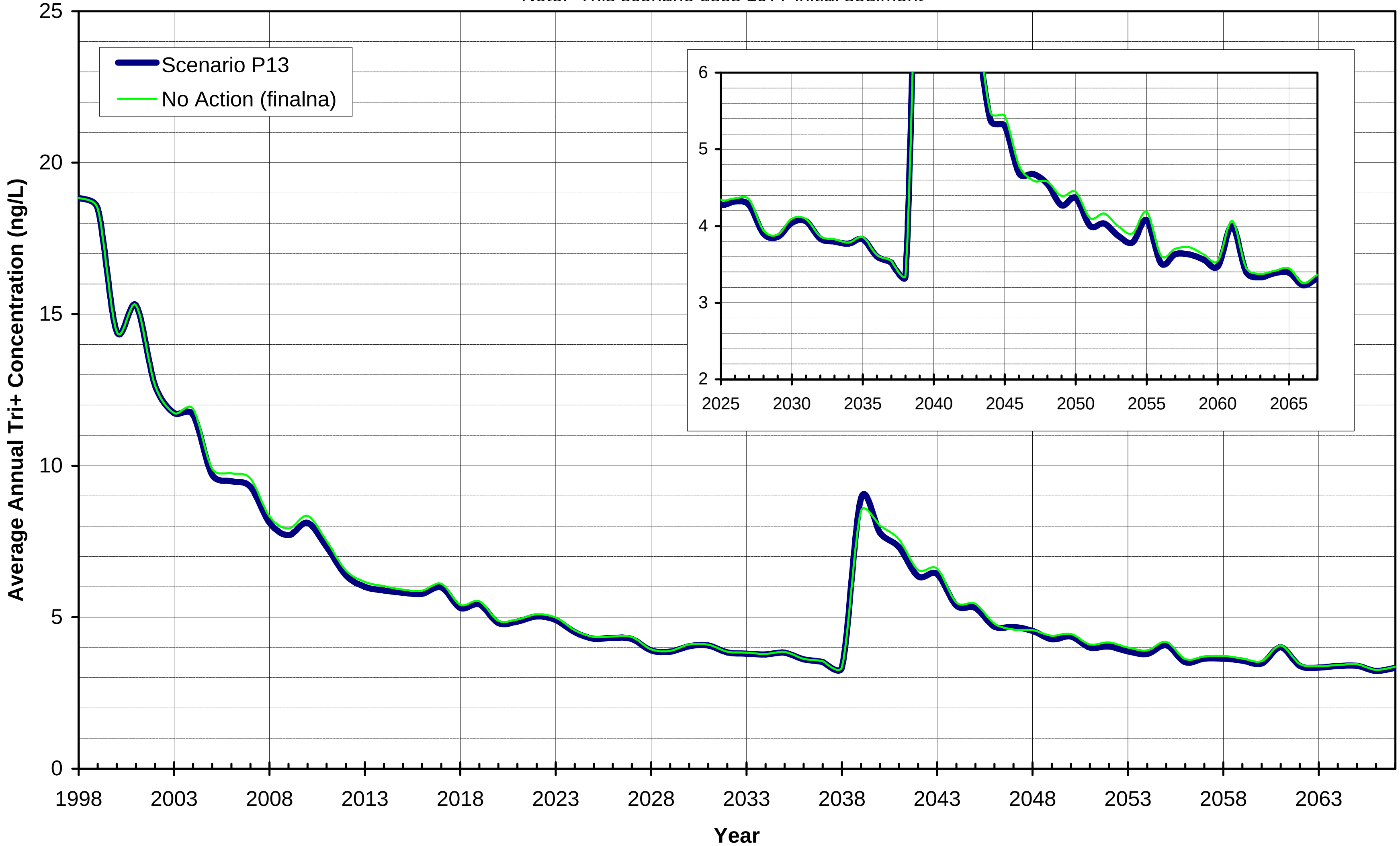
FigsPre1toPre14.xls 12/6/00

Figure PRE-13
Comparison Between Remediation Scenario P13 and No Action Forecast for Waterford Average Annual Tri+ PCB Water Column Concentrations.
Note: This scenario uses 1977 initial sediment



FigsPre1toPre14.xls 12/6/00

Figure PRE-14
Comparison Between Remediation Scenario P13 and No Action Forecast for Federal Dam Average Annual Tri+ PCB Water Column Concentrations.
Note: This scenario uses 1977 initial sediment



FigsPre1toPre14.xls 12/6/00